

**FINAL YEAR PROJECT REPORT  
INTERNSHIP AT AAVA 3D ON 3D MODELING**

**BY**

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This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Multimedia and Creative Technology

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**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

**JANUARY 25, 2022**

## **APPROVAL**

This Project titled “**Internship at AAVA 3D on 3D Modeling**”, submitted by Tanjim Akter to the Department of Multimedia and Creative Technology, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Multimedia and Creative Technology and approved as to its style and contents. The presentation has been held on 25<sup>th</sup> January, 2022.

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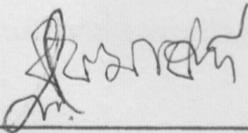
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## DECLARATION

I hereby declare that, this project has been done by me under the supervision of **Mr. Arif Ahmed, Associate Professor, and Department of MCT Daffodil International University**. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

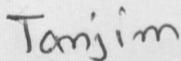
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Finally, I must acknowledge with due respect the constant support and patients of my parents.

## ABSTRACT

The manner human beings specific their mind is converting day by day. 3D animation is one of the new versions of those mediums. While my hobby turned into 3D visualization So, I had been selected by the **AAVA 3d** institute for my internship work. It turned into my purpose to articulate the paintings in a dynamic but the entire method from story constructing to modeling, texturing, animation, light setup, rendering, and post-processing. The final output of this mission is video photos that mix all of the paintings this is achieved optimistically expresses the concept at the back of making it.

Though it is challenging, with commercial key features, usability, durability, the appearance of products may be proven to purchasers in the shortest time. Bad commercials Irritate a customer with beside a point and vain facts which destroy the budget and time. The mission is ready to create 3D visualization paintings which can be inclusive of Product modeling, furniture modeling, and architecture visualization work.

Autodesk Max has been Used to create fashions and animation. Vray | Autodesk Max Plugin had been used to create the rendering part. For the architectural paintings, we render in Lumion.

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# CHAPTER 1

## INTRODUCTION

A Center for Research & Development Of 3D Animation. Bangladesh's First Complete 3D Animation & VFX Learning Institute. It is an organization where professionals from both technical and artistic fields group together with an objective of providing appropriate solutions.

3D modelers build 3D characters and environments that are based on the concept art. 3D modeling is a highly specialized field. As such, there is a high demand for 3D Modelers in all industries. According to the Bureau of Labor Statistics (BLS), depending on the specialization, employment in this field had grown by 8-14% by 2018. Modelers also create character skeletons; which animators then control. Modeling is performed using a variety of programs such as Maya, 3DS Max, Pixar's RenderMan, POV-Ray, and many others<sup>[1]</sup>.

As it is a 3D institute so we are working here in a group. They give us three category that we need to create those models as they want. They providing us demo which are Product modeling, Furniture modeling and Architecture Visualization work related. We are choosing Autodesk Max as our main software for modeling, texturing, uv unwrapped, animation. For lighting, and rendering, PBR material we are using Vray. And also including Lumion for rendering, lighting, texturing animation. Vray is a plugin that has been used for high rendering in Autodesk max and Lumion is based on architectural rendering software that makes it easy to convey how designs will translate into real-life gestures and emotions. Autodesk Max and Lumion is also compatible with After Effect which is my editing and compositing software.

Basically, it isn't possible to create a whole work alone. And we are assigned as a team. So, we divided our work. Most of the interior model was created by me in the Architecture Part. The rest of the work like lighting, rendering, texturing was covered by the other one.

Several 3D software is there like Autodesk Maya, Blender, and Cinema 4D does the same job as Autodesk Max did. But for architectural work, product modeling such as hard surface, furniture modeling Autodesk max is easy to create shapes with low to a high polygon. And Lumion takes less time than Vray, Arnold, etc. for rendering animation or still images. Definitely Vray contains a higher resolution image than Lumion, Unreal engine, Corona, Red shift and Arnold. And for this, we have chosen Autodesk Max, Vray and Lumion for this entire work.

## CHAPTER 2

### BACKGROUND STUDY

As I need to did modeling 3d products, furniture and an interior and exterior work I need to study a lot. Find out the present market place situation. As the company give me specific products so it is little bit easy for me to find out how can I make the product output better as they want.

The idea of selecting a pattern and stylizing all the products and decorating the environment according to what they want. For completing this project, we also, ensure visiting's of several architecture workshops and products modeling and watching a lot of showreels worldwide to find out the lacking's and what type of design is currently hyped in the market place. And what should make this sector more preferable to the consumers. By studying all those existing designers' websites, we tried to make the visualization more effective for the company.

As we are working as a team so firstly we decided to make a list first where we selected the first topic which is product modeling then we do our furniture modeling and lastly, we did a huge architecture visualization work which is contains interior and exterior.

AAVA 3D provide us various websites links <sup>[2]</sup> also which help us to organize the art work properly. Which help us to get lot of information about color sense, camera angle, lighting and last but not the list modeling with a medium low poly.

## CHAPTER 3

### DETAILS OF SOFTWARE

#### 3.1: Autodesk Max:

Autodesk 3ds Max, previously 3D Studio and 3D Studio Max, is an expert 3D pc graphics application for making 3D animations, models, games, and images. It is regularly utilized by online game developers, many TV business studios, and architectural visualization studios. For its modeling and animation tools, the brand-new model[which?] of 3ds Max additionally capabilities shaders (including ambient occlusion and subsurface scattering), dynamic simulation, particle systems, radiosity, everyday map advent and rendering, international illumination, a customizable consumer interface, new icons, and its personal scripting language.



Fig 3.1.1: Autodesk Max Software

The unique 3D Studio product became created for the DOS platform via way of means of the Yost Group and posted via way of means of Autodesk. After 3D Studio DOS Release 4, the product became rewritten for the Windows NT platform, and renamed "3D Studio MAX". This model became additionally at the start created via way of means of the Yost Group. It became launched via way of means of Kinetics, which became at that point Autodesk's department of media and entertainment.

When it became re-launched (launch 7), the product became once more branded with the Autodesk logo, and the fast call became once more modified to "3ds Max" (top and  
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decrease case), at the same time as the formal product call have become the current "Autodesk 3ds Max"<sup>[4]</sup>. Basically, it was the main software where we did our work 3D visualization.

### **3.2: AutoCAD:**

AutoCAD is a computer-aided layout software program evolved via way of means of the organization Autodesk. It lets you to attract and edit virtual 2D and 3D designs extra speedy and without problems then you can via way of means of hand.

Here are different experts who use AutoCAD:

Architects: AutoCAD is frequently used to create blueprints and ground plans for homes and industrial buildings. It additionally comes with integrated equipment that could examine and treat weaknesses in a building's layout.



Fig 3.1.2: AutoCAD Software

Interior Designers: Similarly, AutoCAD may be used to assume the indoors of a building, whether or not it's a consuming area for an eating place or a dwelling area in a home.

Fine Artists: The capabilities of AutoCAD are so wide-ranging that even artists use it to draft sculptures, wooden carvings, engravings, and experimental artwork pieces <sup>[5]</sup>. This software used for create an outline for the architecture visualization. Where we can add measurement easily.

### 3.3: Adobe Photoshop:

Adobe Photoshop is a raster photos editor developed and posted via way of means of Adobe Inc. for Windows and macOS. In addition to raster photos, Photoshop has confined capabilities to edit or render textual content and vector photos (specifically through the clipping route for the latter), in addition to three-D photos and video. Its characteristic set may be elevated via way of means of plug-ins. Photoshop from the start should shop documents in different formats, which include TIF, JPEG, and GIF. These documents are smaller than PSD documents due to the fact they lack the editable capabilities of a PSD file [6].



Fig 3.1.3: Adobe Photoshop Software

This software was using for creating textures, post production work, after render we did color correction on that.

### 3.4: Vray:

V-Ray is a rendering engine that makes use of worldwide illumination algorithms, consisting of route tracing, photon mapping, irradiance maps, and directly computed worldwide illumination [7].



Fig 3.1.4: Vray Plugin

This software used for render in real time image. It takes lot of time to render per frame but the output came out was wondering.

### 3.5: Lumion:

Lumion is designed to be effortless, transparent, and stress-free. Backed by more than 10 years of development, Lumion comes entire with the whole thing you want for putting your layout in its nearby context. Simply import your model, follow substances and create a placing with people, trees, cars, furniture, and some other context. An unmarried click on offers your venture an enthralling sky. Show a residence at the oceanfront. Lumion makes it smooth to expose your layout in its destiny placing and talking the imaginative and prescient at the back of your venture <sup>[8]</sup>.



Fig 3.1.5: Lumion

This is the software which we used for our architecture work. As it's a huge animating video so we need to make an output with less time. So, this is the perfect software for this type of work.

### **3.6: Adobe After Effect:**

Adobe After Effects is a virtual visual effect, motion graphics, and compositing software evolved by Adobe Systems and used in the post-manufacturing technique of movie-making, video games, and tv manufacturing. Among different things, After Effects may be used for keying, tracking, compositing, and animation. It additionally capabilities as a totally fundamental non-linear editor, audio editor, and media transcoder <sup>[9]</sup>.



Fig 3.1.6: After Effect Software

After finishing all the work in pre-production then we shift to the post production work though after effect were we also added sound to the work and doing some color correction, masking etc.

### **3.7: Adobe Media Encoder:**

Adobe Media Encoder capabilities as an encoding engine for Adobe Premiere Pro, Adobe After Effects, Adobe Audition, Adobe Character Animator, and Adobe Prelude <sup>[10]</sup>.

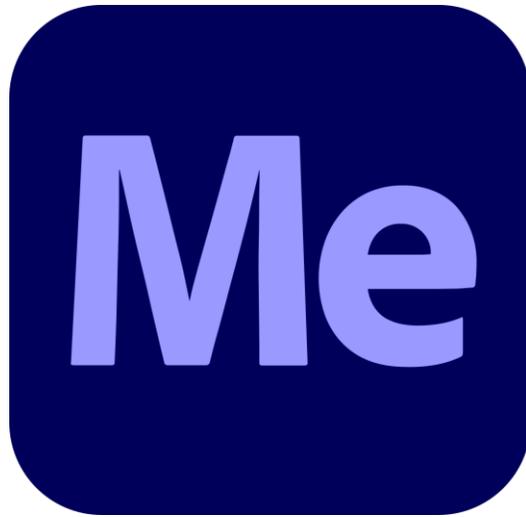


Fig 3.1.7: Adobe Media Encoder Software

For rendering our file from after effect we used media encoder to make the file size smaller with the high quality.

## CHAPTER 4

### PROJECT WORKFLOW

#### 4.1: Modeling:

3D modeling is the process of creating a 3D representation of any surface or object by manipulating polygons, edges, and vertices in virtual 3D space. You can observe the imaginative and inventive creatures and architecture in movies, animations, and video games. 3D modeling has a variety of consequences. In this project, we've chosen Autodesk Max 2021 as our modeling software. Boxes, spheres, lines, and cylinders are among the standard primitives used in this game. In this modeling technique, adjustments were made to generate multiple models. Adjustment is done via tools like extrude, insert, bridge, combine, and FFDs like bend, lattice, and so forth. When designing all of the models, it is essential that all of the polygons be kept as quads. Here is an overview of all of the models I created, along with their various implications.

##### 4.1.1: Bookshelf:

This bookshelf was made of rectangle shapes. So that's why the poly count was less. This was given by the company and told me to create a modern bookshelf with a low poly so it's a challenge for me to create an object with details and which contains low poly. Take a rectangle and create shapes as they give me the measurement. Then extrude them and lastly add a chamfer to the edges for softening the sides. Which makes them look like high poly models. And as this was need to be animated the scene so I need to keep each part separated from each other.

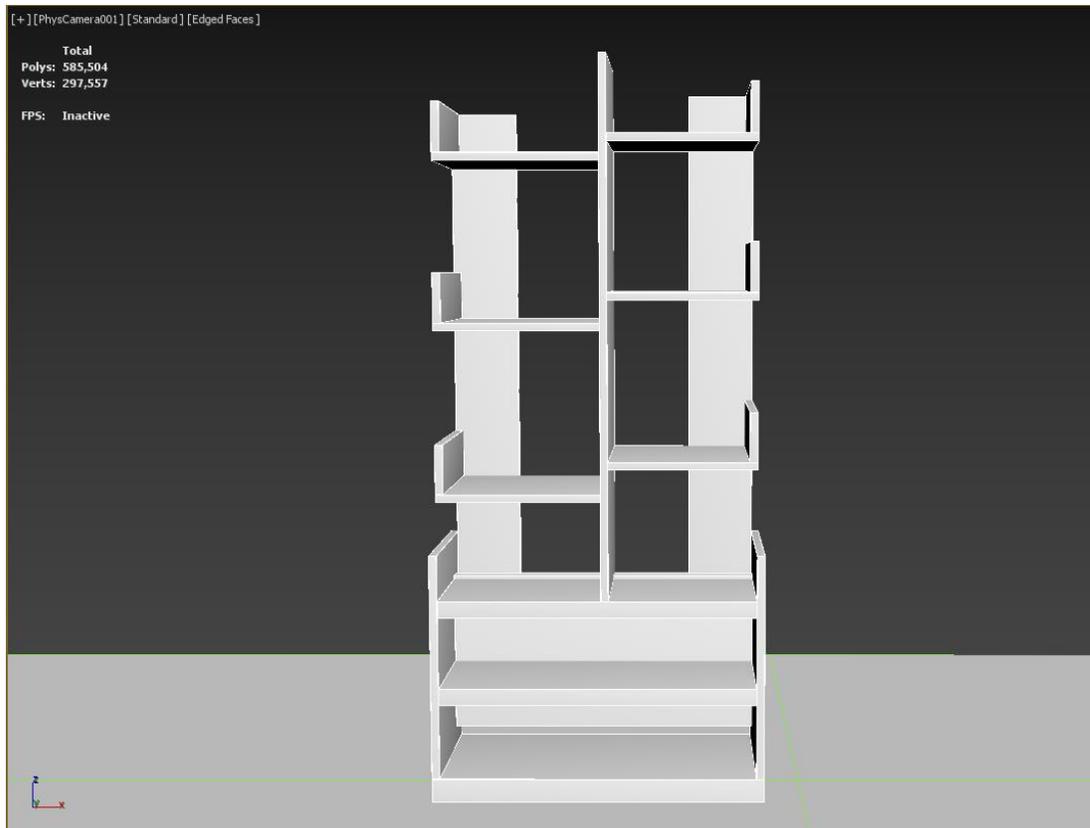


Fig 4.1.1: Book Shelf

This picture of the bookshelf contains low to medium polygon. It's a modern bookshelf which can be used in the office, house or also can be used for decorating other things.

#### 4.1.2: Side Table:

This table was created for decorating the scene. This table was also created from the rectangle. Then Extrude the rectangle and add a chamfer. The lower part was created by box and then took the vertices and created shapes like the picture. And lastly added a sphere to the drawer for the opener. The sphere was also modifier by the edited poly. Take the vertices and scale them a little bit smaller to the upper side and grab the last 2 edges or borders and move them forward. Then apply the turbo smooth for the smoothness.

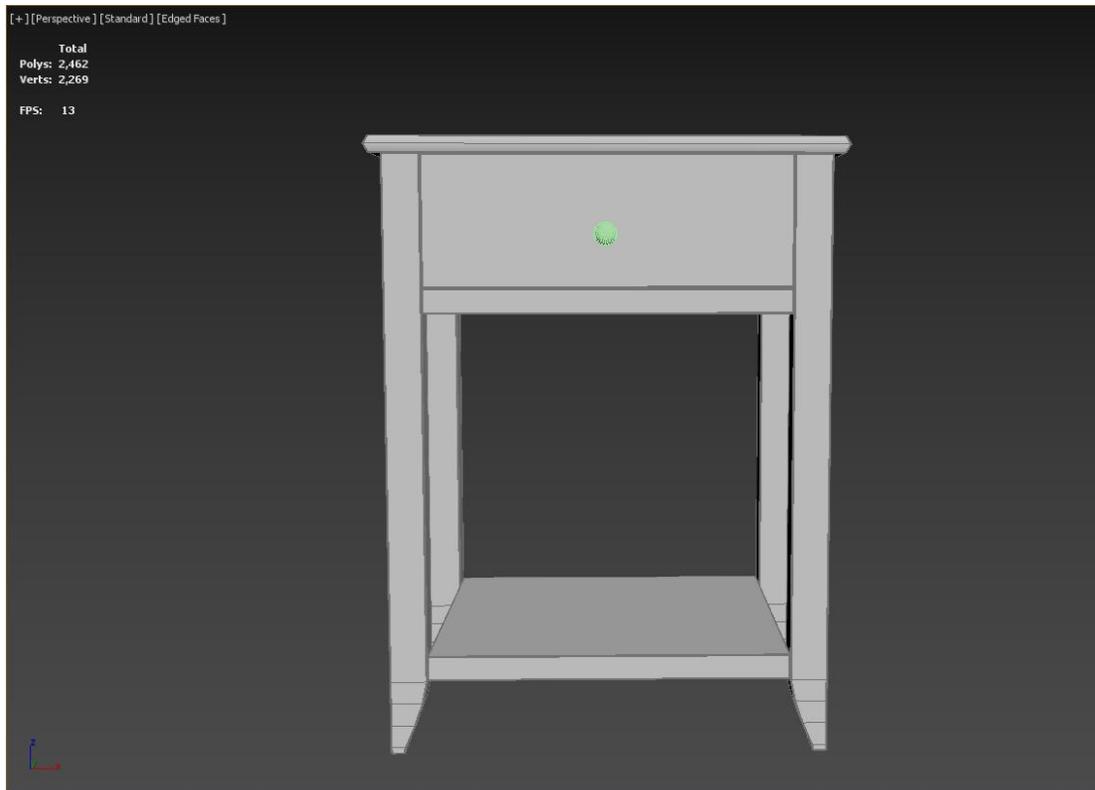


Fig 4.1.2: Side Table

This table contains some objects on it which make the scene more elegant. It has low to medium polygon and a nicely chamfered edge as well.

### 4.1.3: Rocking Chair:

The chair was made by the line shape and after that apply the shell modifier. Put the measure to the outer shell and the inner shell then apply the edit poly modifier from the modifier list. As much as I needed to create the chair nicely I put edit poly again and again so that's the reason for my less mistaken. This was inappropriate so I remove the edit poly and take another one from the modifier list and work on it. After all those things when the model was ready I apply the chamfer modifier and rather than this between edges I apply chamfer from the edit poly so the edges get some supportive edges as well. Play with the vertices as I want to make a shape of course I look after the given image which was for my demo and try to make it look more realistic.

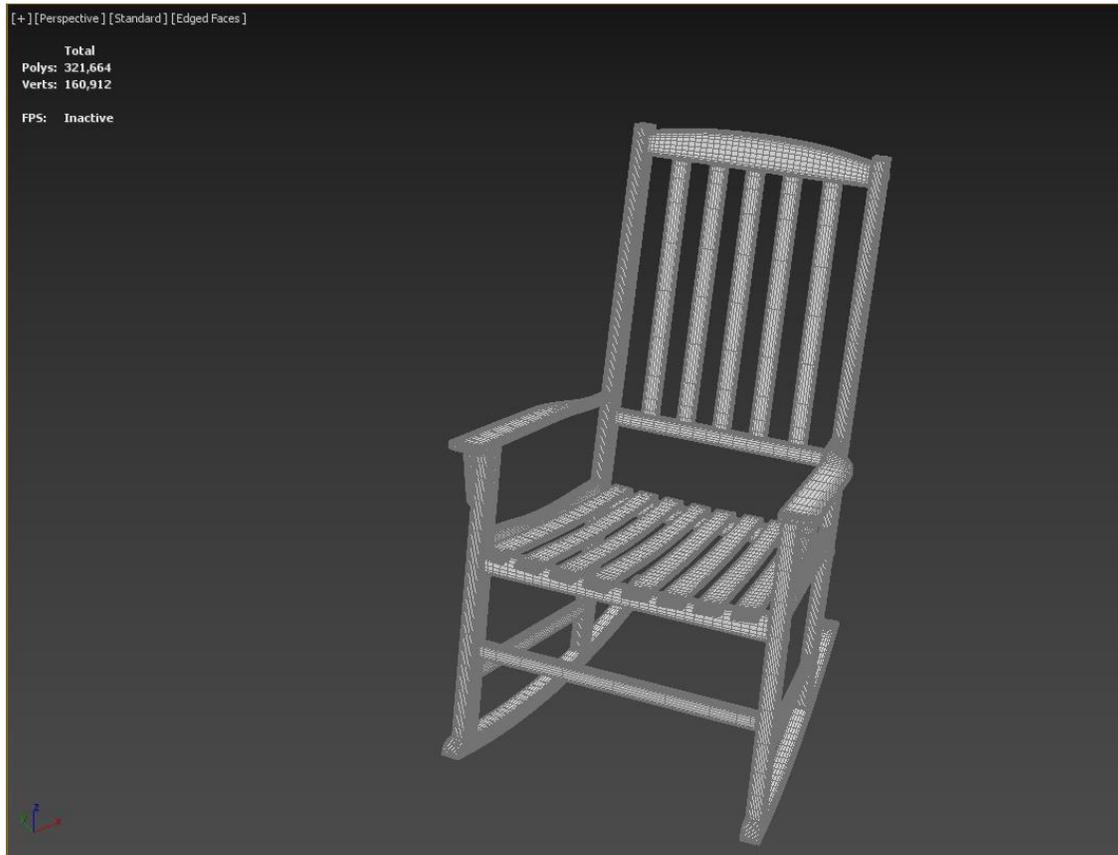


Fig 4.1.3: Rocking Chair

This rocking chair was maintained quad which was modified by line and edit poly. It helps to delete the mistake easily so that whenever I want to go back I can go which is very helpful than Autodesk Maya.

#### **4.1.4: Books:**

Books are essential for this bookshelf. So, I took a box and put an edit poly then put some edges. Took the vertices as I needed and shrunk them to the back side and created a shape that looked like a book. Then do several copies of it to make the shelf heavy.

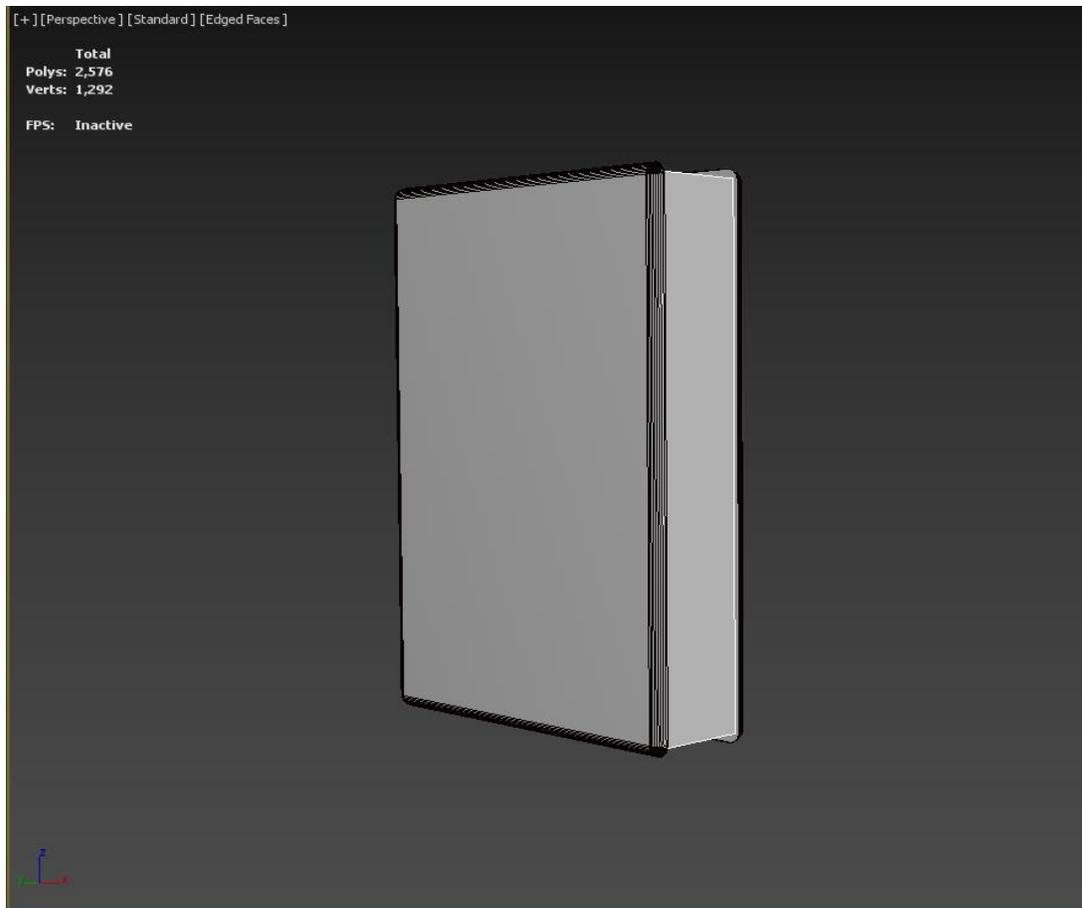


Fig 4.1.4: Book

This book contains the minimal edges to maintain the low poly law. This was made from a box shape. It was so easy to create several books from it.

#### **4.1.5: Wall Clock:**

Wall clock is a mandatory thing I thought so that's why I put it in the scene. Take a cylinder and increase the edges and decrease the height as well it was needed. Then take a line and create the outer shape and to give it some thickness add a extrude modifier.

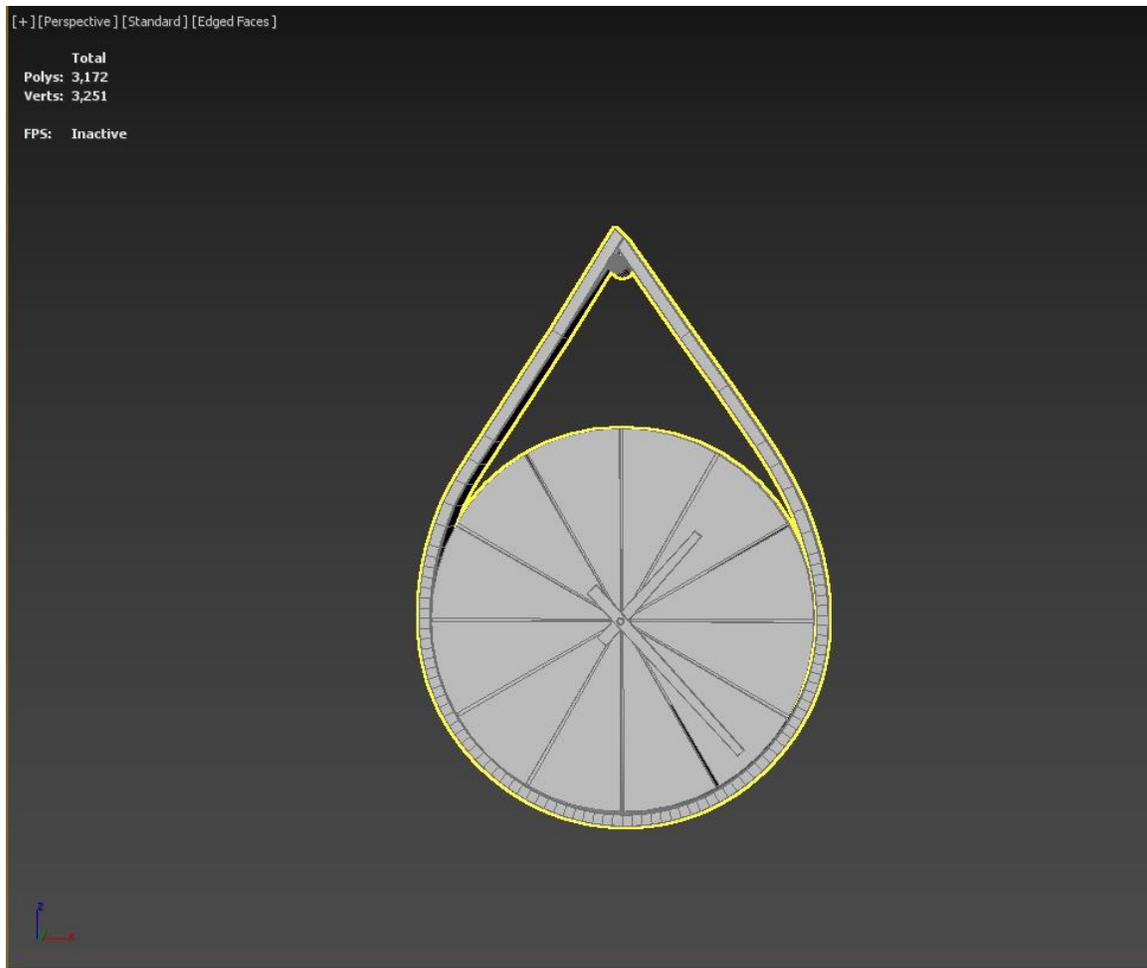


Fig 4.1.5: Wall Clock

This clock contains decorate the scene even beautifully. This was made from a cylinder shape. It was so easy to create the bar and the side panel from the outer side.



Fig 4.1.6: Bookshelf 3D Modeling

This is the scene after all the objects are put together. Before the animation I was checking the company for the organization when they approve it then I started to do the key frame animation in Autodesk max.

#### 4.1.6: Wear drop:

Another model was wear drop. For this modern wear drop making, I like to work with rectangle shapes. As I said before which are very comfortable to make shapes. Take edit poly on the rectangle shape before it gives the extrude from the modifier panel. Created the base first then side part copy from the base and edited by the vertices as I need.

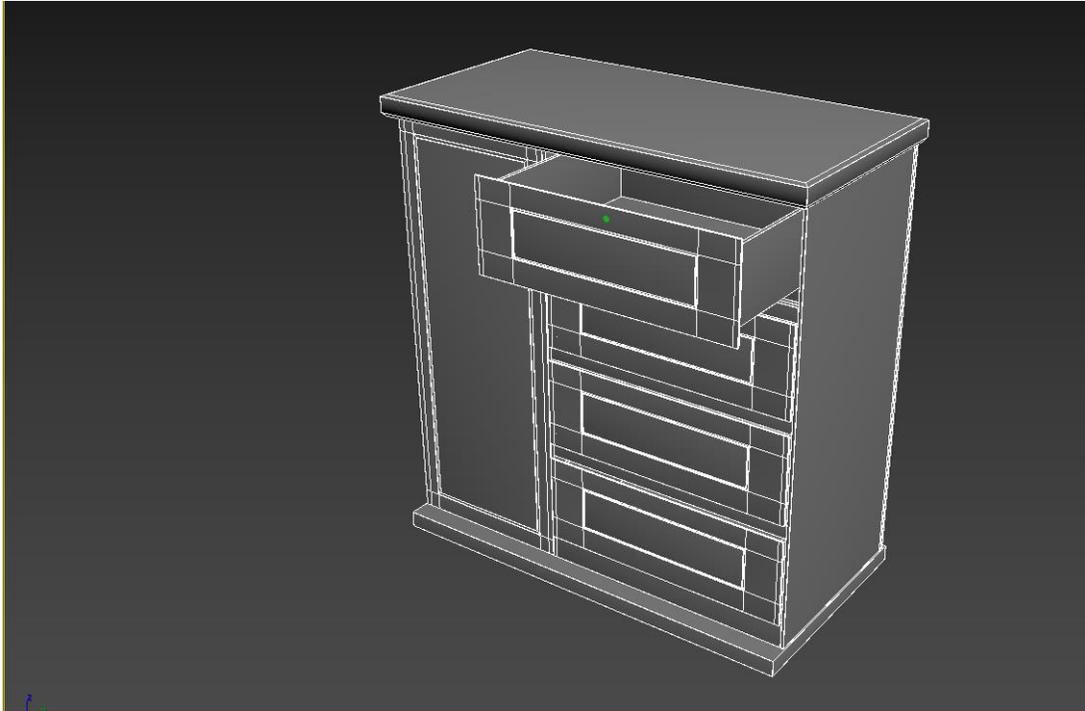


Fig 4.1.7: Wear drop with the wireframe



Fig 4.1.8: Wear drop

This model was also animated after completing the whole scene. It contains four drawers and a long part with a lock and a nice thin handle. Without chamfer it was not completed.

#### 4.1.7: Showpiece:

Created some showpieces for decorated the scene nicely. For this take boxes and create the shapes and also take a line from the shape and make the upper ribbon on the box. And make a tray which carries the whole things together.

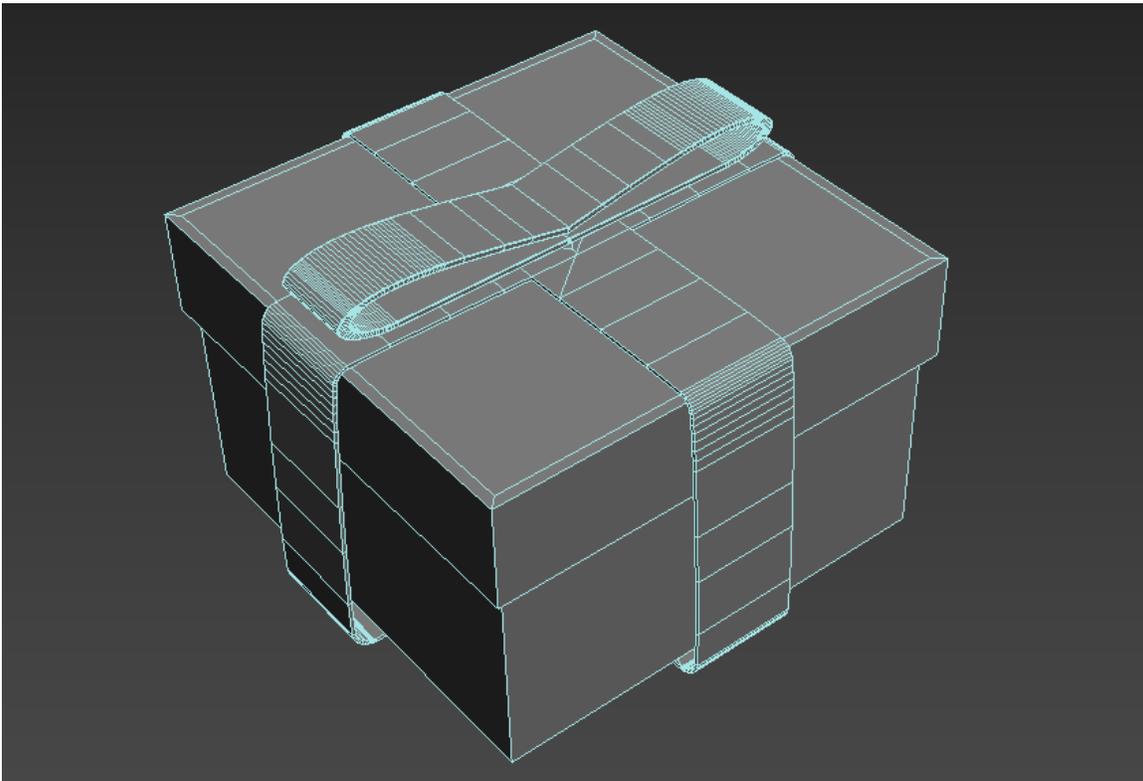


Fig 4.1.9: Showpiece Box

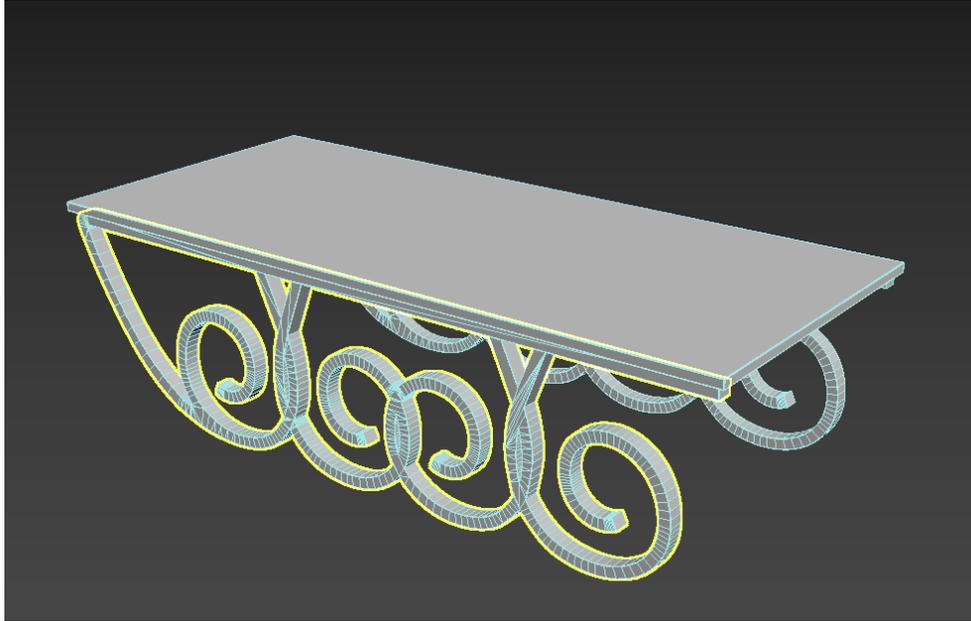


Fig 4.1.10: Showpiece Tray

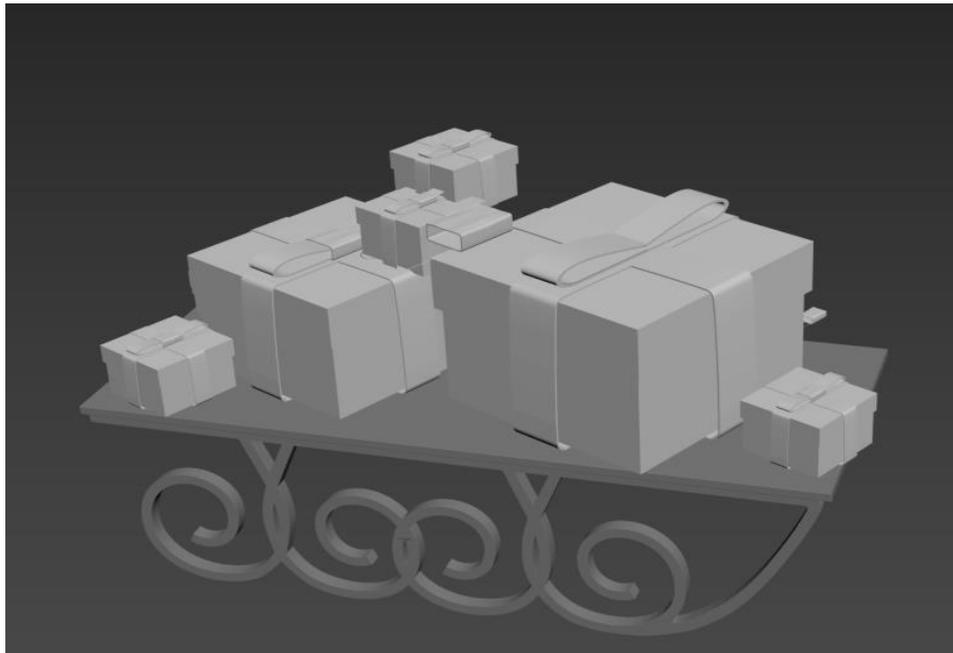


Fig 4.1.11: Showpiece with Tray

This object contains quad polygon as much as I can make it a simple standard. Applying chamfer makes this softer and nicer.

#### 4.1.8: Study Desk:

Another model was giving me study desk for the adult people and also maintain the modern. Take a box then apply the edit poly from the modifier then take the vertices and making the shape as the given picture or demo.

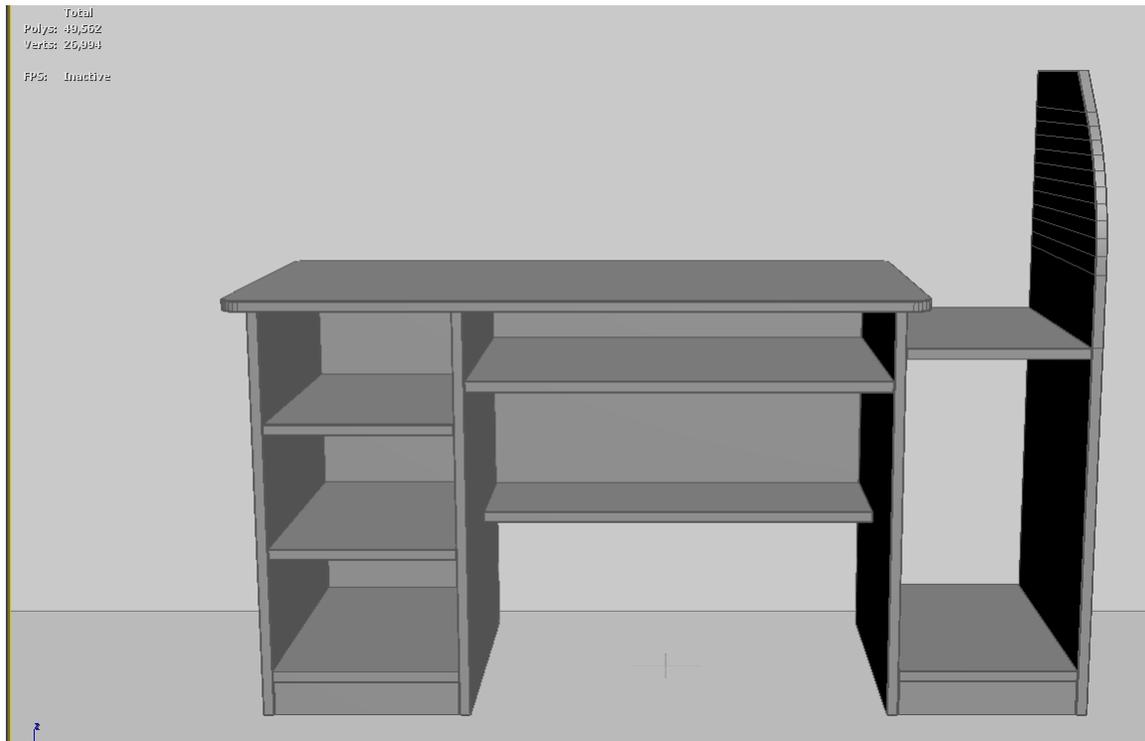


Fig 4.1.12: Study Desk

This desk contains a lot of parts where the students can easily keep their books and others stuffed and accessories.

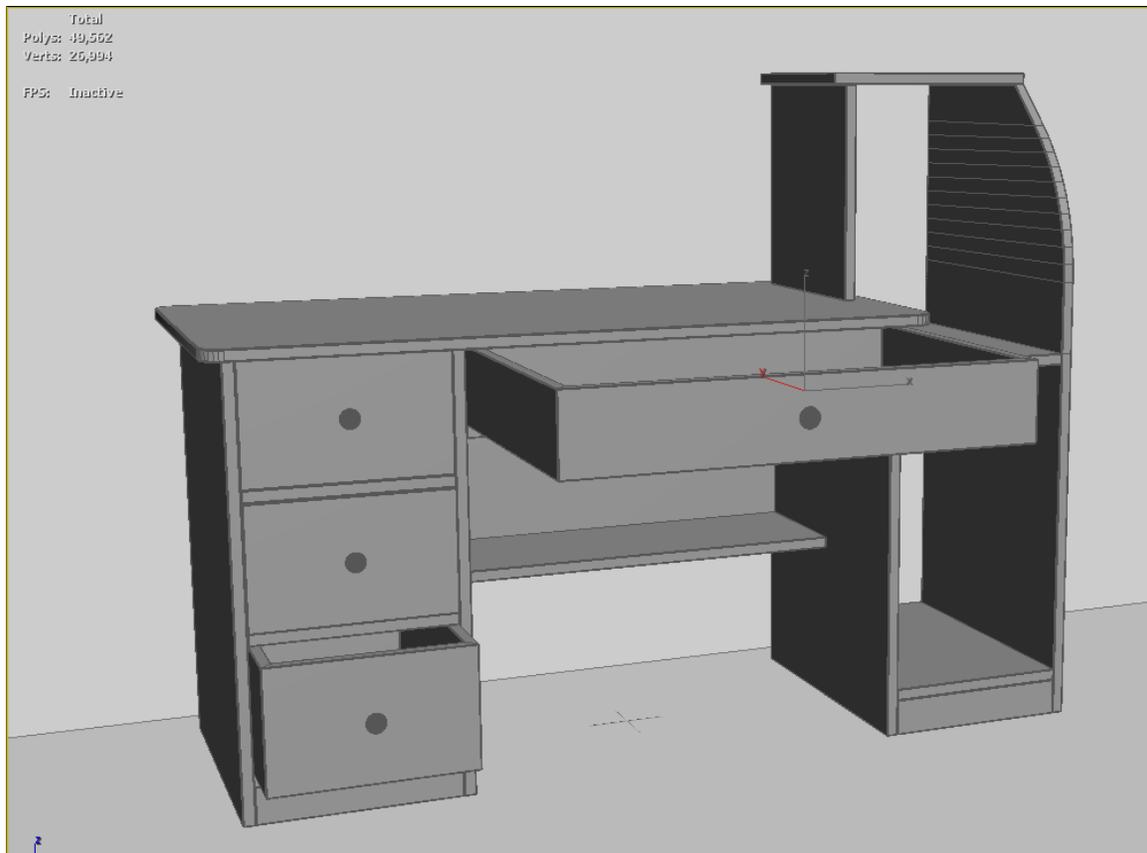


Fig 4.1.13: Study Desk

This is the full model after completing the project. Box are nicely chamfered and maintain the quad as well.

#### 4.1.9: Divan:

Divans are made up of two parts: a base and a cushion. They can be used for lounging, sleeping, or a combination. Nowadays everyone uses divan to make their houses more standard and well decoder.

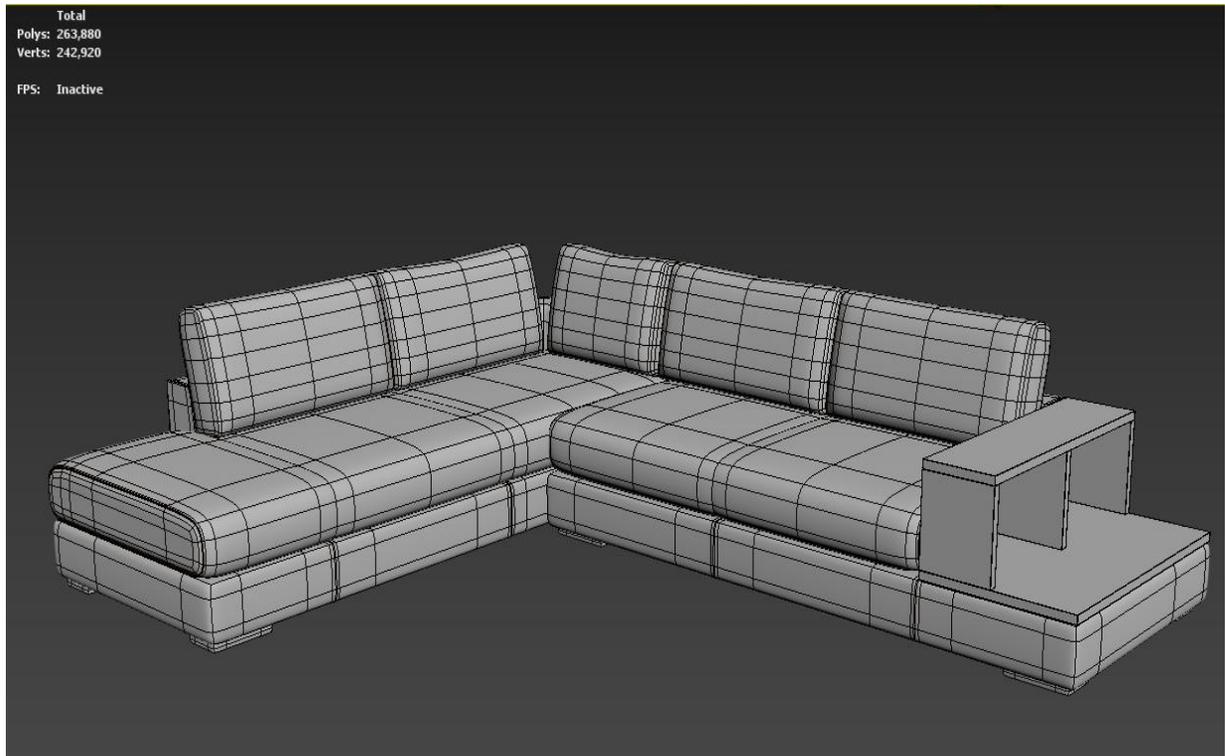


Fig 4.1.14: Divan Modeling

Firstly, take a box as a reference then take another box and apply edit poly on it then take the vertices and make the model. After doing this apply FFD 4x4x4 and select the vertices as needed. Then take another box for the base and side part and the feet which are given under the base. After all, that added chamfer modifier all over the object. Then for the pillow take another box and add some edges and take the middle edge and scale it.

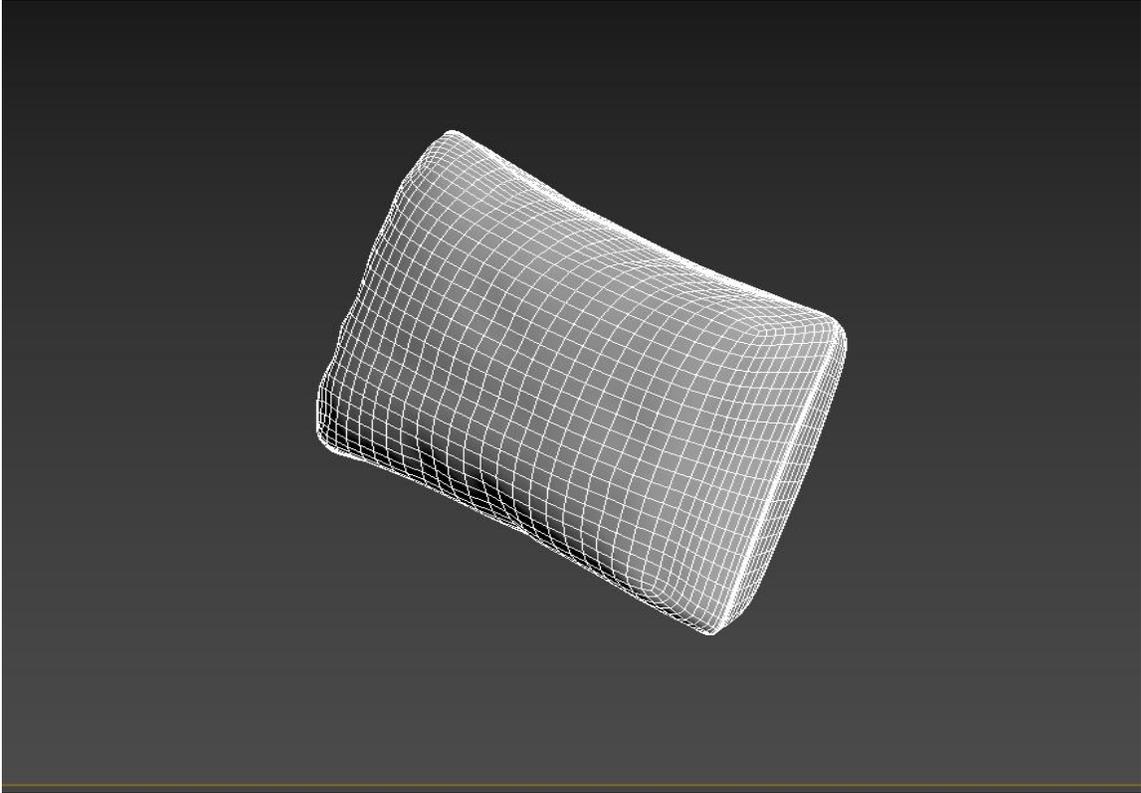


Fig 4.1.15: Pillow Modeling

Also, apply the ffd3x3x3 and apply the turbo smooth from the modifier panel. Make several copies from it and place them all over the divan.



Fig 4.1.16: Divan with The Pillow Modeling

This is the full picture when it ready. Those pillows need to be resized when all those are gathering together. The final result is really so soothing.

#### **4.1.10: Table Modeling:**

This table was created for decorating the scene. This table was also created from the rectangle shapes and cylinder shape. Then Extrude the rectangle and add a chamfer. Take line from shapes and create two shapes from it. The upper part was created from box and then took the vertices and created shapes like the picture. Created parts between the box. This model was used under the Tv shelf as a supporting prop.

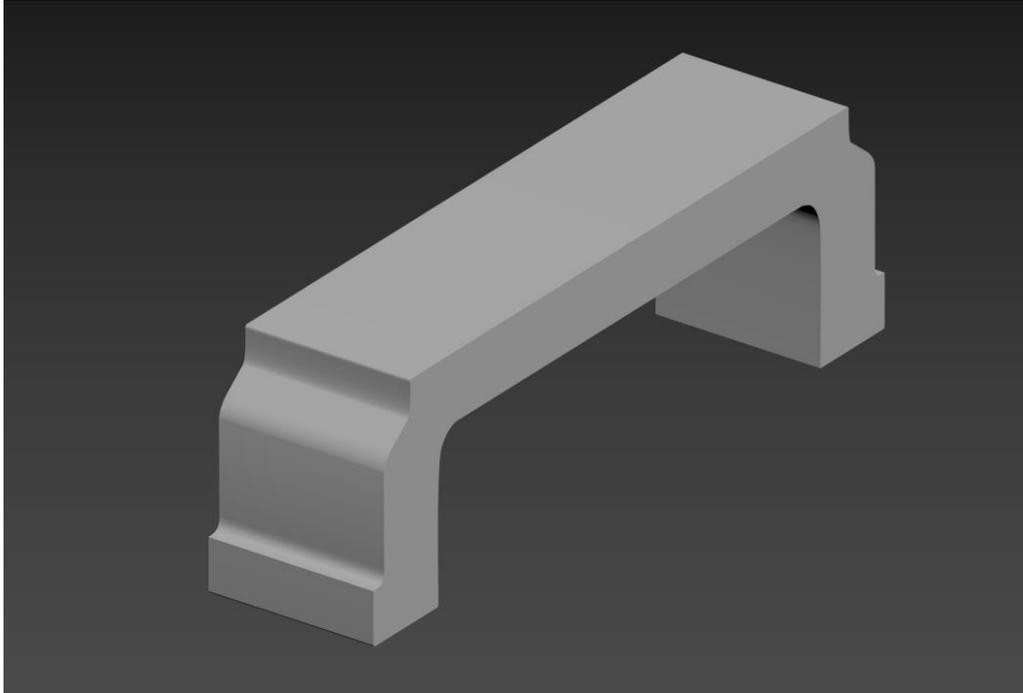


Fig 4.1.17: Table's Base modeling

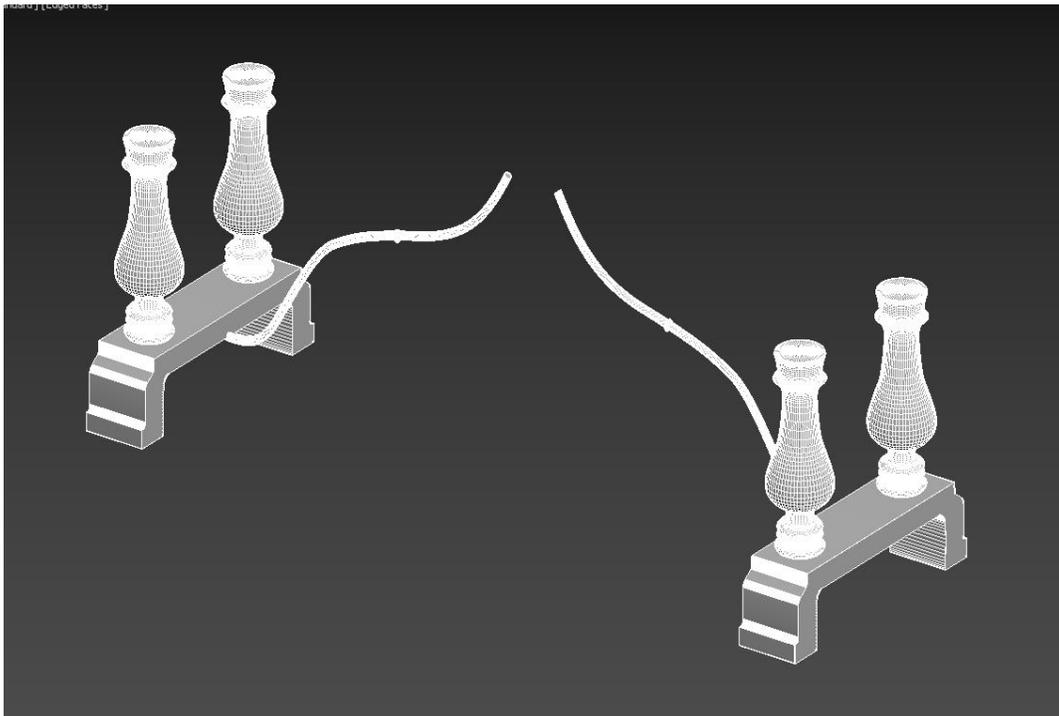


Fig 4.1.18: Table's Base modeling

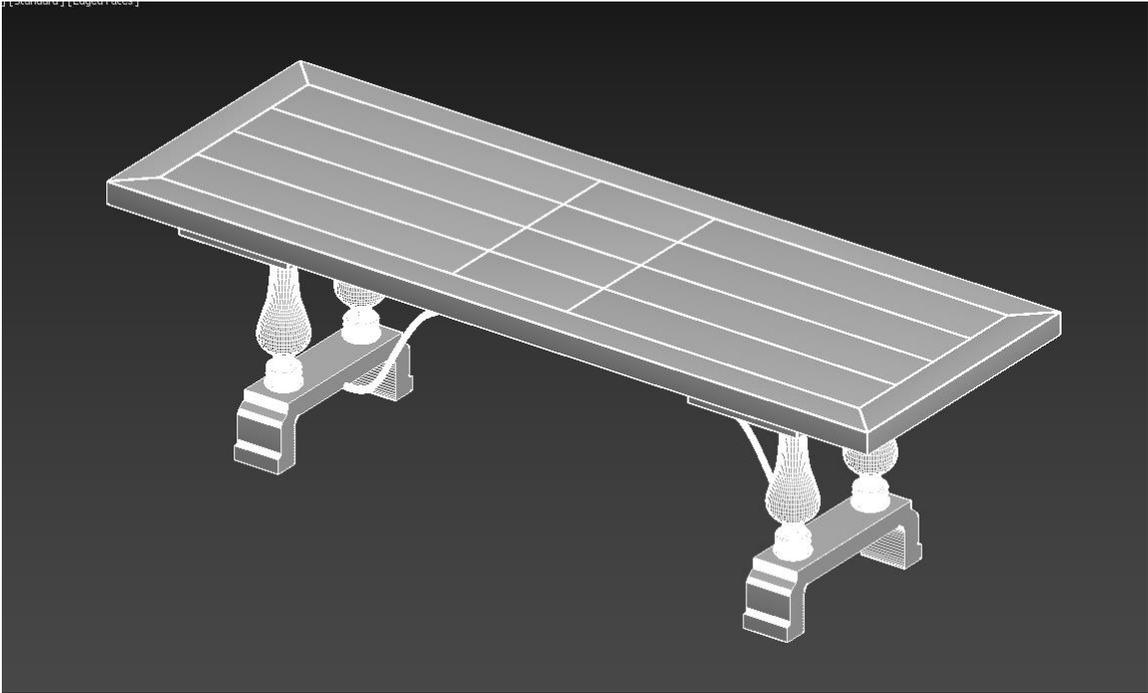


Fig 4.1.19: Table modeling wireframe

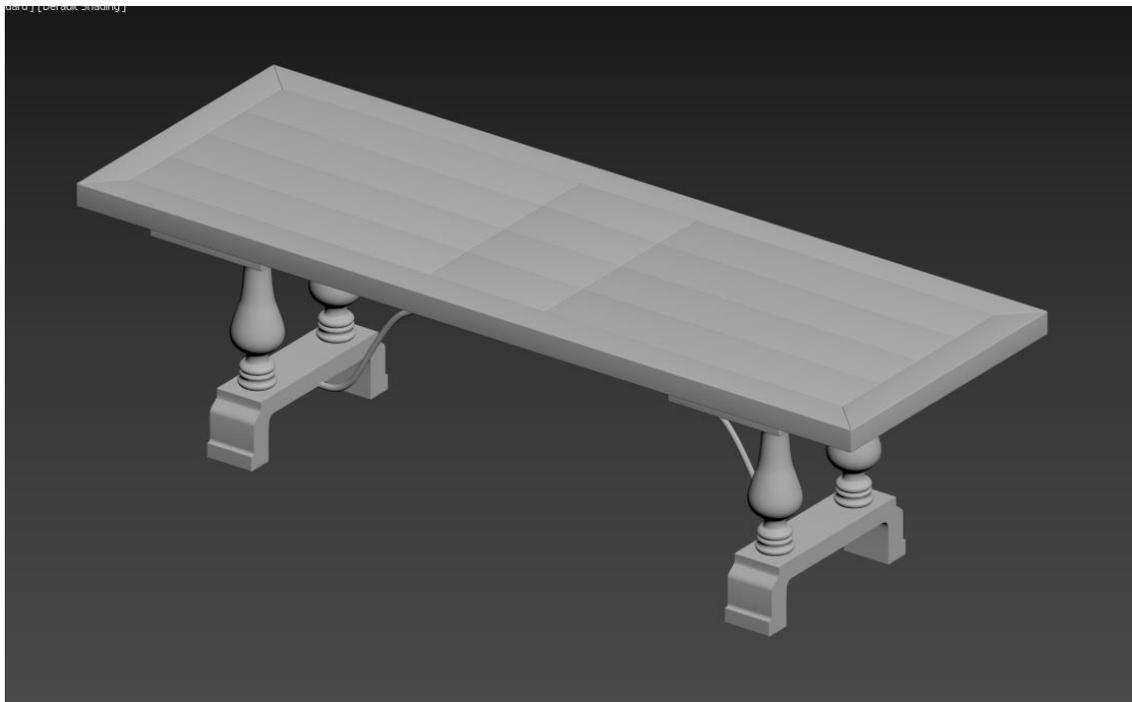


Fig 4.1.20: Table modeling

This table was model for Architectural Visualization. All those pictures are the step that how this model was created in Autodesk Max.

#### **4.1.11: Almirah Modeling:**

The almirah is easy to make. Take a box for the measurement and after that take a rectangle to create the sides. Then convert to spline and take all the vertices and apply the corner method. Add extrude modifier to the rectangle shapes and make the part as needed. Created the side front base back from this rectangle shape.

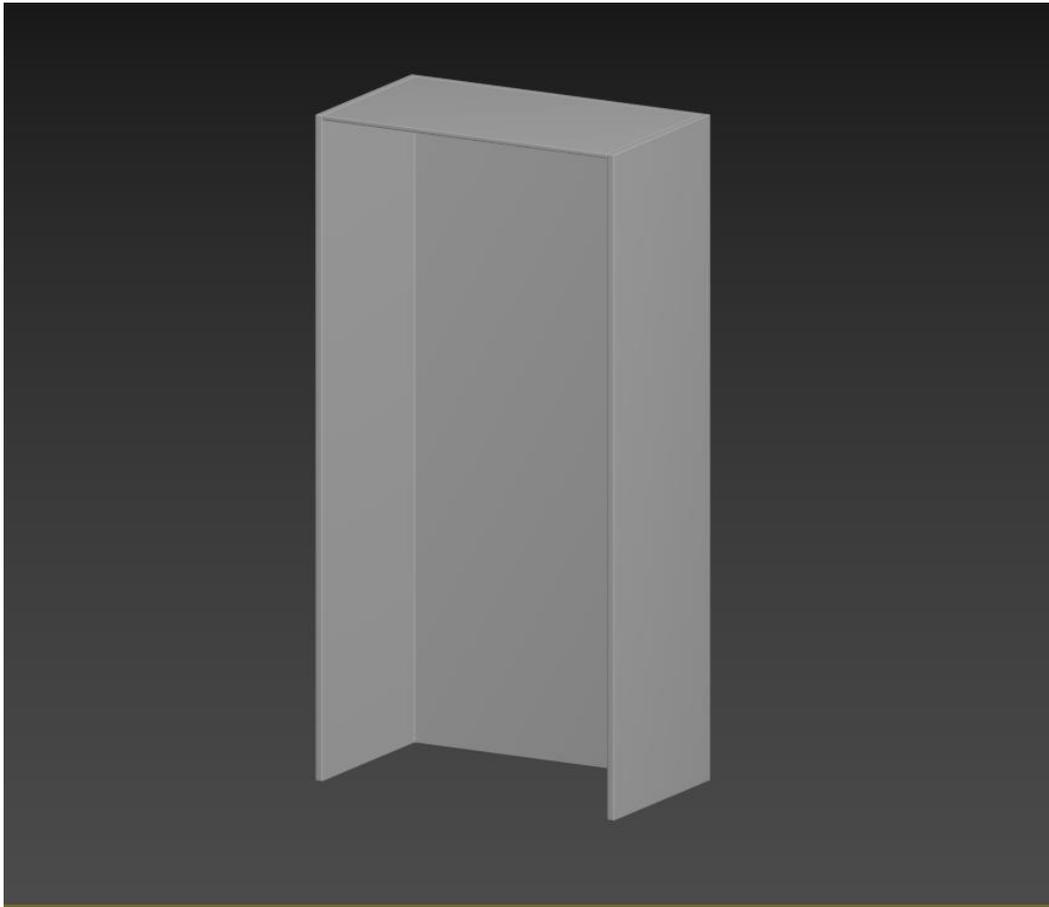


Fig 4.1.21: Almirah modeling

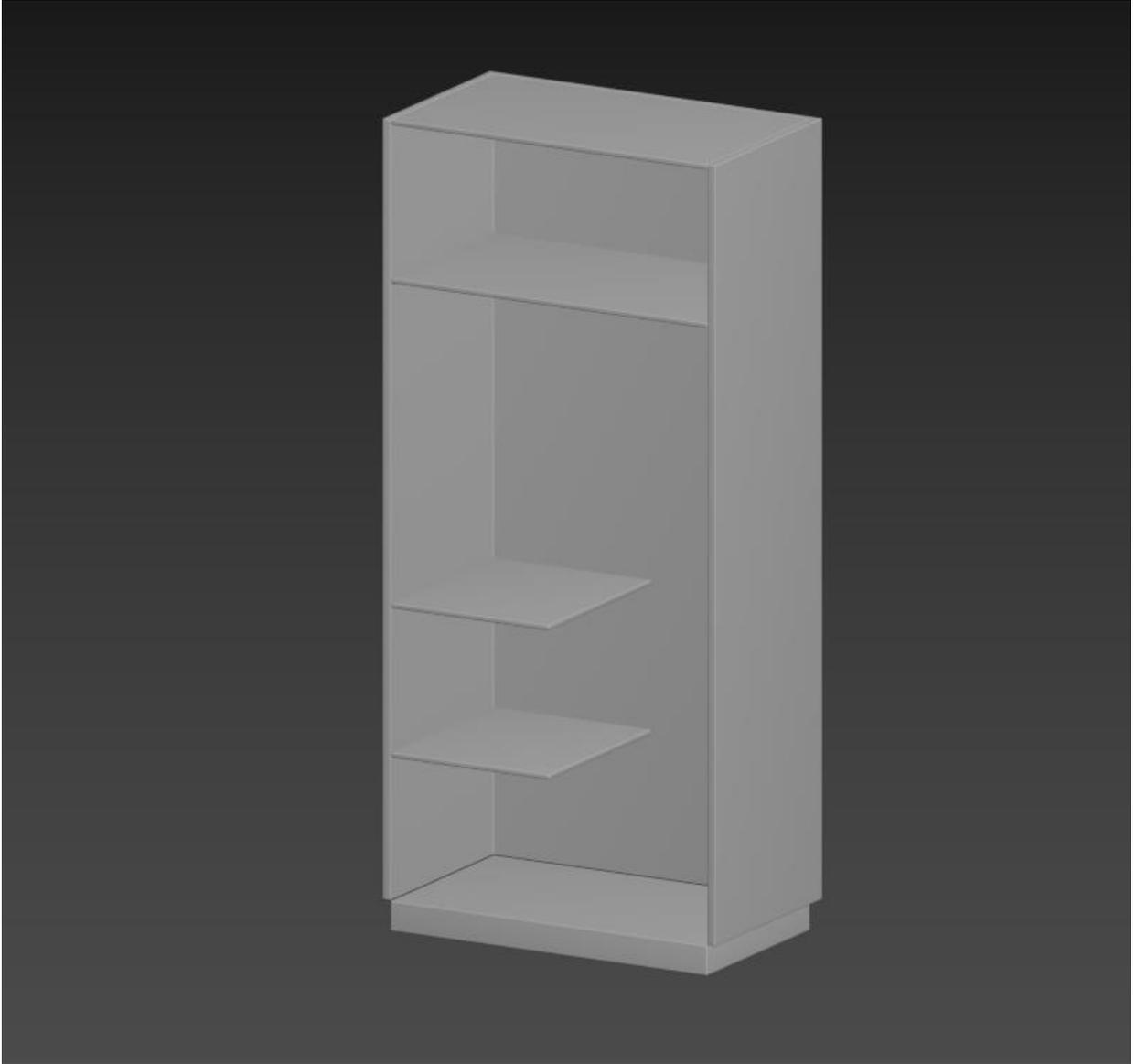


Fig 4.1.22: Almirah modeling

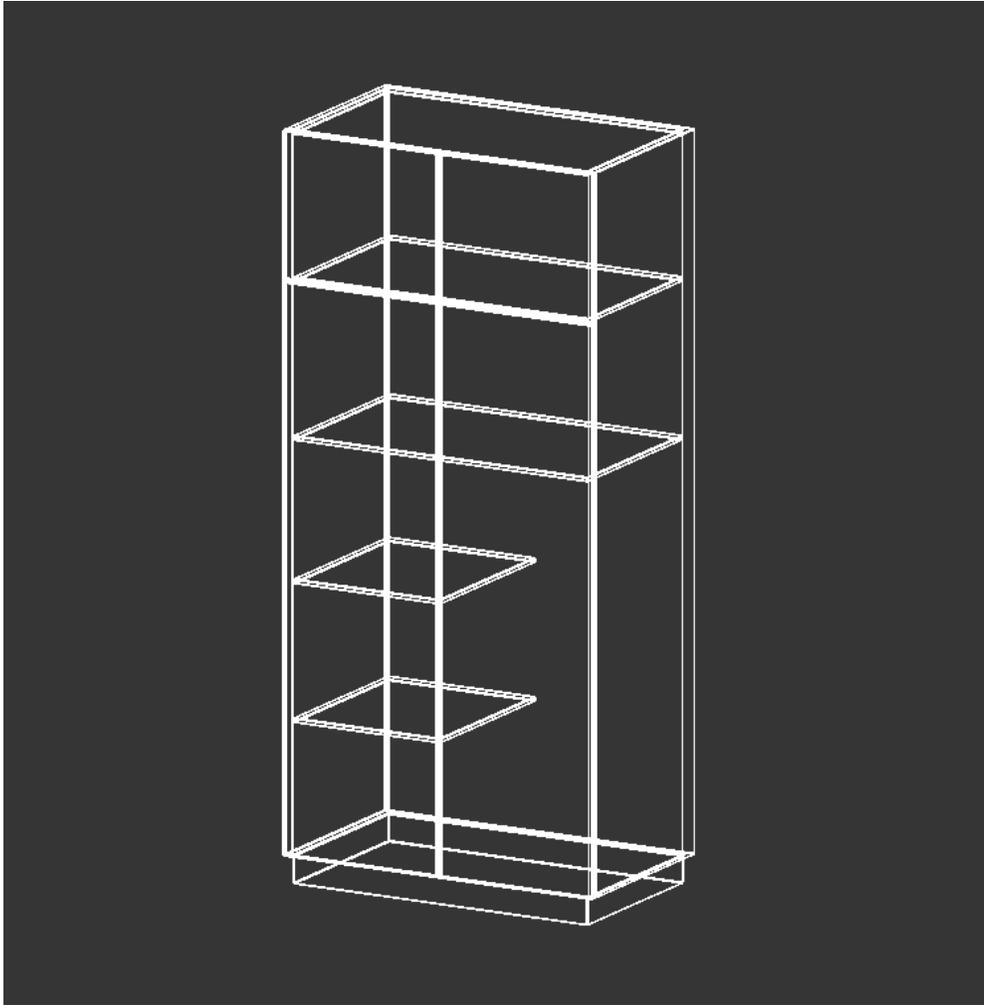


Fig 4.1.23: Almirah modeling

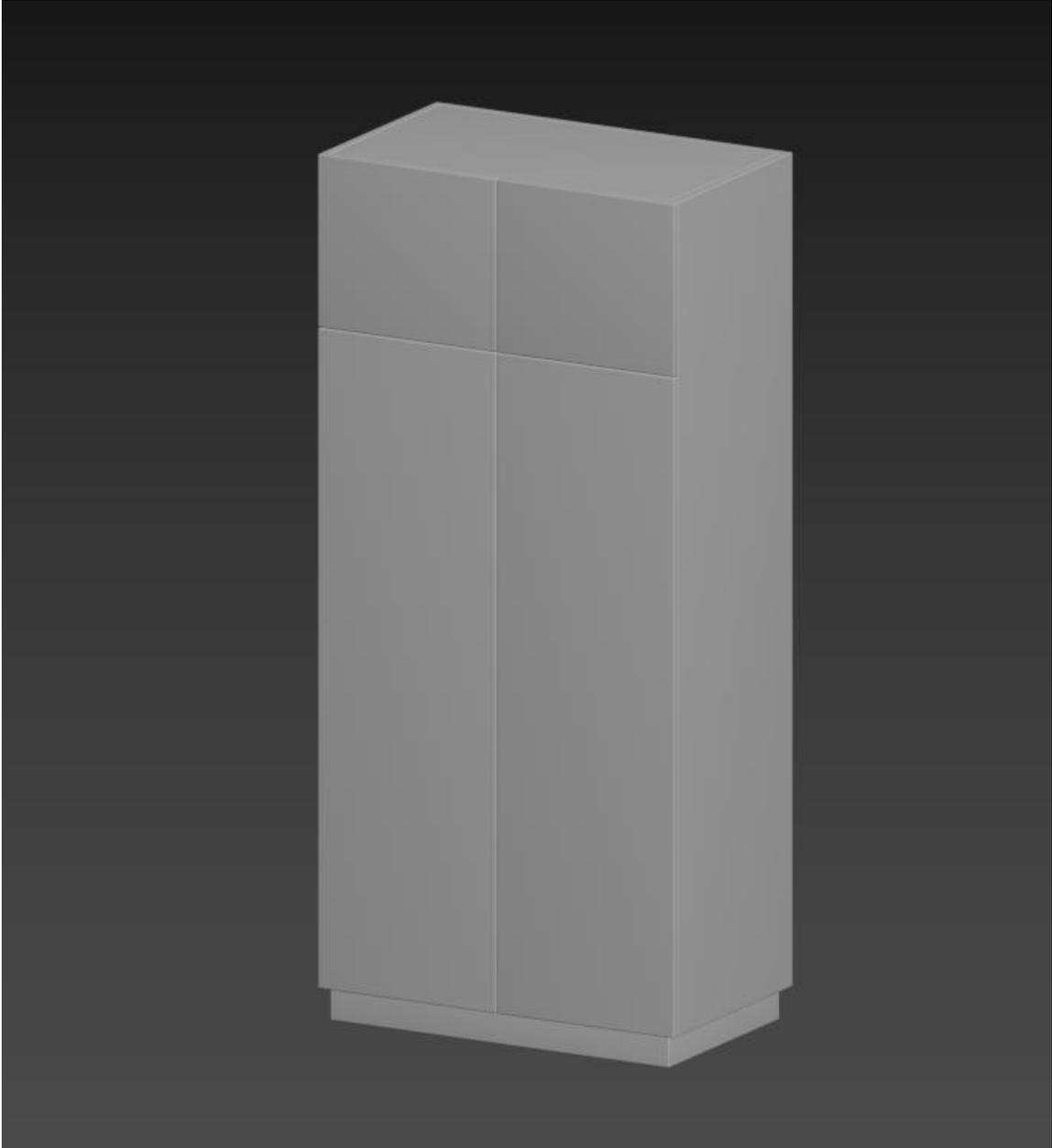


Fig 4.1.24: Almirah modeling

This model was simple and easy to make. When it created I keep that in mind it needs to be modern and stylish with low poly figure. Without chamfer it was not completed well.

#### 4.1.12: Study Desk Modeling:

Another model was giving me study desk for the adult people and also maintain the modern type. Take a rectangle then apply the edit poly from the modifier then take the vertices and making the shape as the given picture or demo.

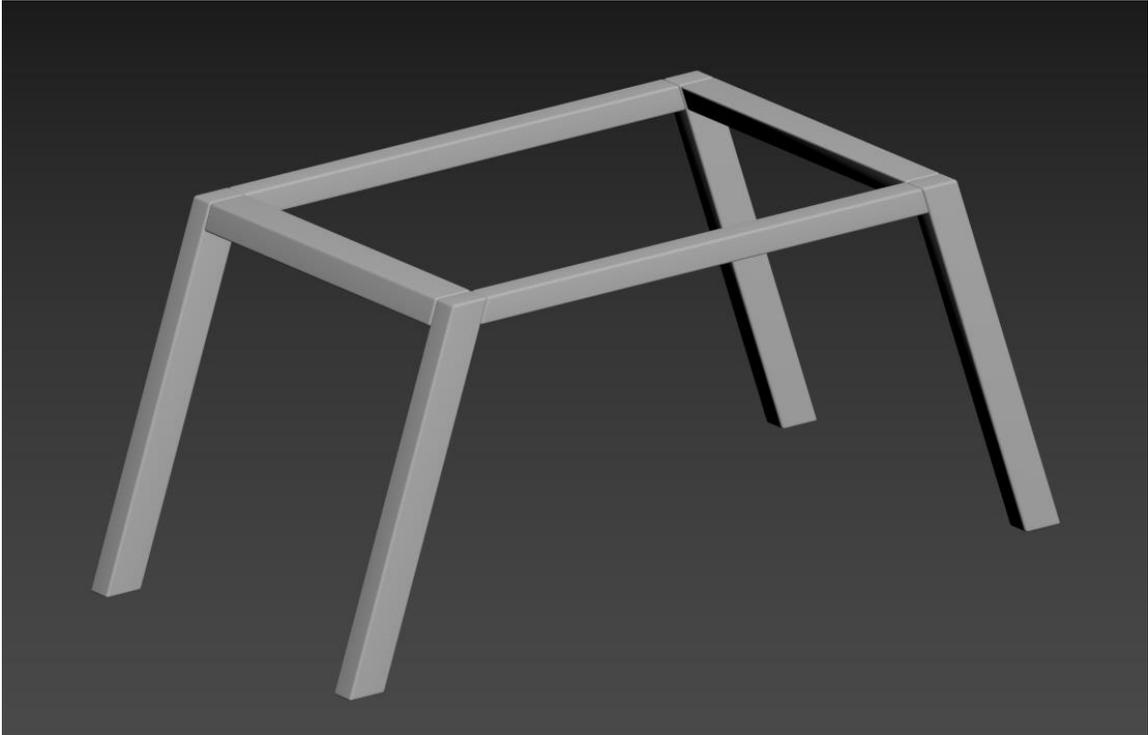


Fig 4.1.25: Study Desk



Fig 4.1.26: Study Desk



Fig 4.1.27: Study Desk



Fig 4.1.28: Study Desk



Fig 4.1.29: Study Desk

Created the base first then take another box for the side part front part and back part. Take another box added some edged by taking edit poly from the modifier list take the vertices and create a half oval shape. All the part is separated from each other so that we can easily modify each part after creating the full model.

#### 4.1.13: Book Stand Modeling:

This bookshelf was made from rectangle shapes. So that's why the poly count was less. This was given by the company and told me to create a modern bookshelf with a low poly so it's a challenge for me to create an object with details and which contains low poly. Take a rectangle and create shapes as they give me the measurement. Then extrude them and lastly add a chamfer to the edges for softening the sides. Which makes them look like high poly models. And as this was need to be animated the scene so I need to keep each part separated from each other.

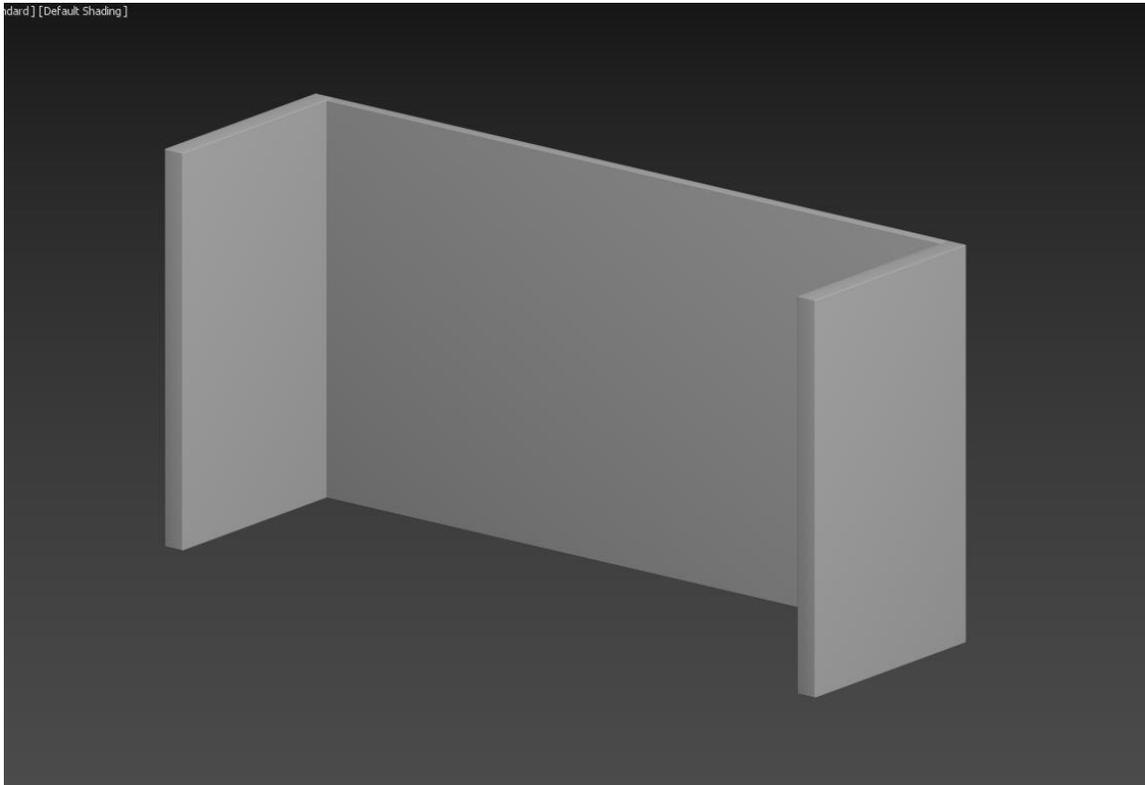


Fig 4.1.30: Book stand

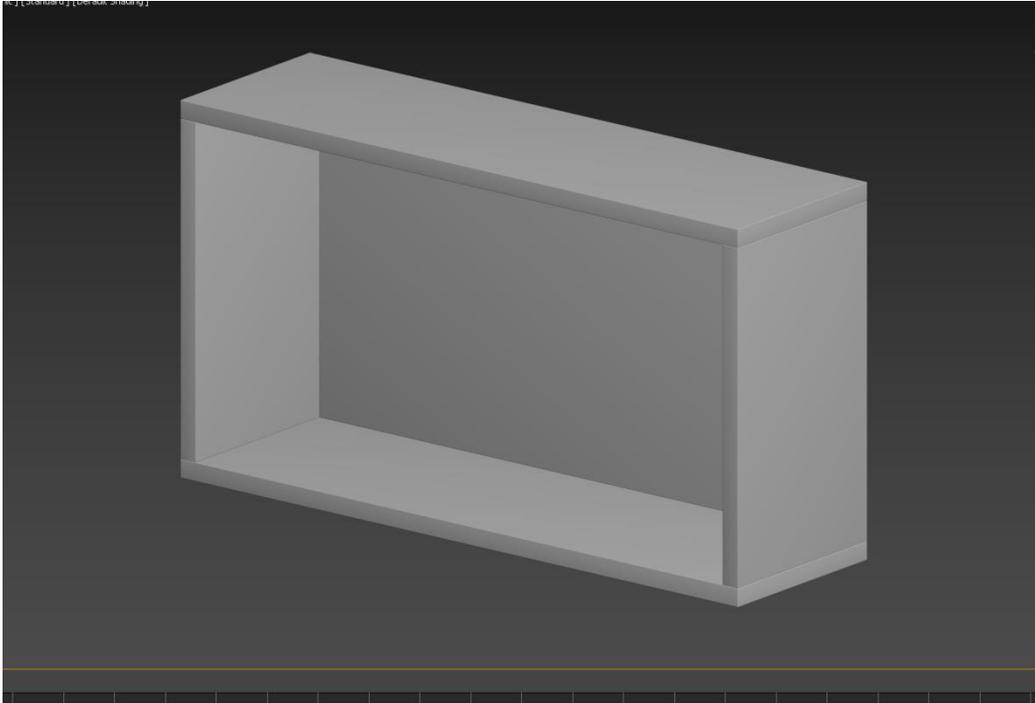


Fig 4.1.31: Book stand

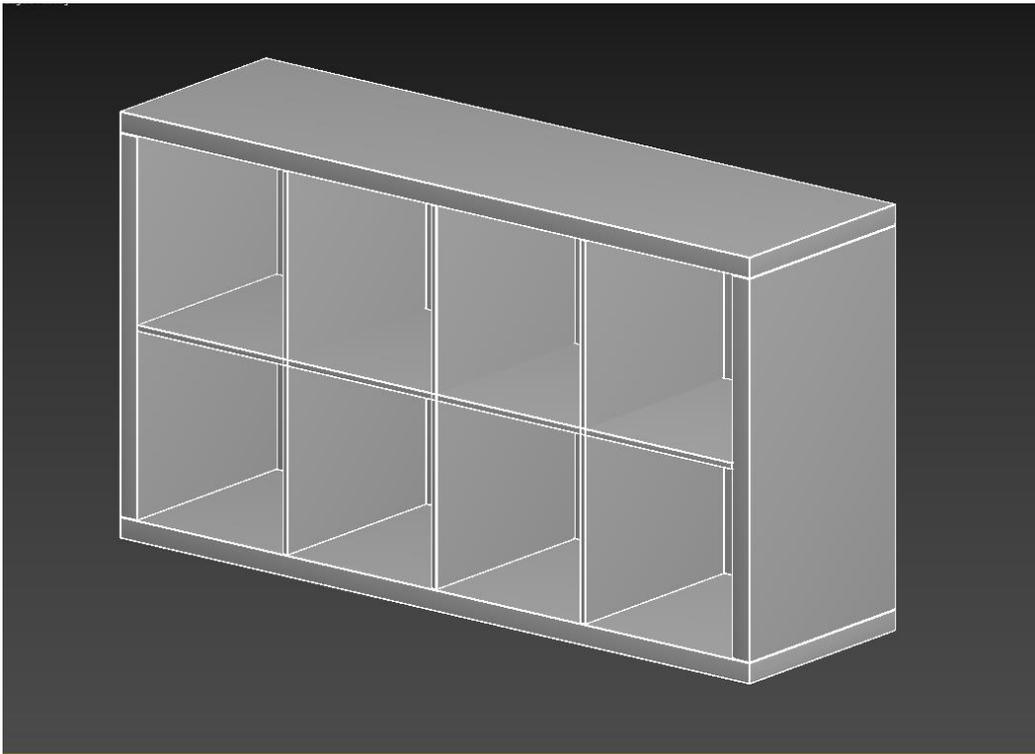


Fig 4.1.32: Book stand Wireframe Mode

This picture of the bookstand contains low to medium polygon. It's a modern bookshelf which can be used in the office, house or also can be used for decorating other things.

#### **4.1.14: Book Rack Modeling:**

Take a box for the measurement and after that take a rectangle to create the sides. Then convert to spline and take all the vertices and apply the corner method. Add extrude modifier to the rectangle shapes and make the part as needed. Created the side front base back from this rectangle shape.

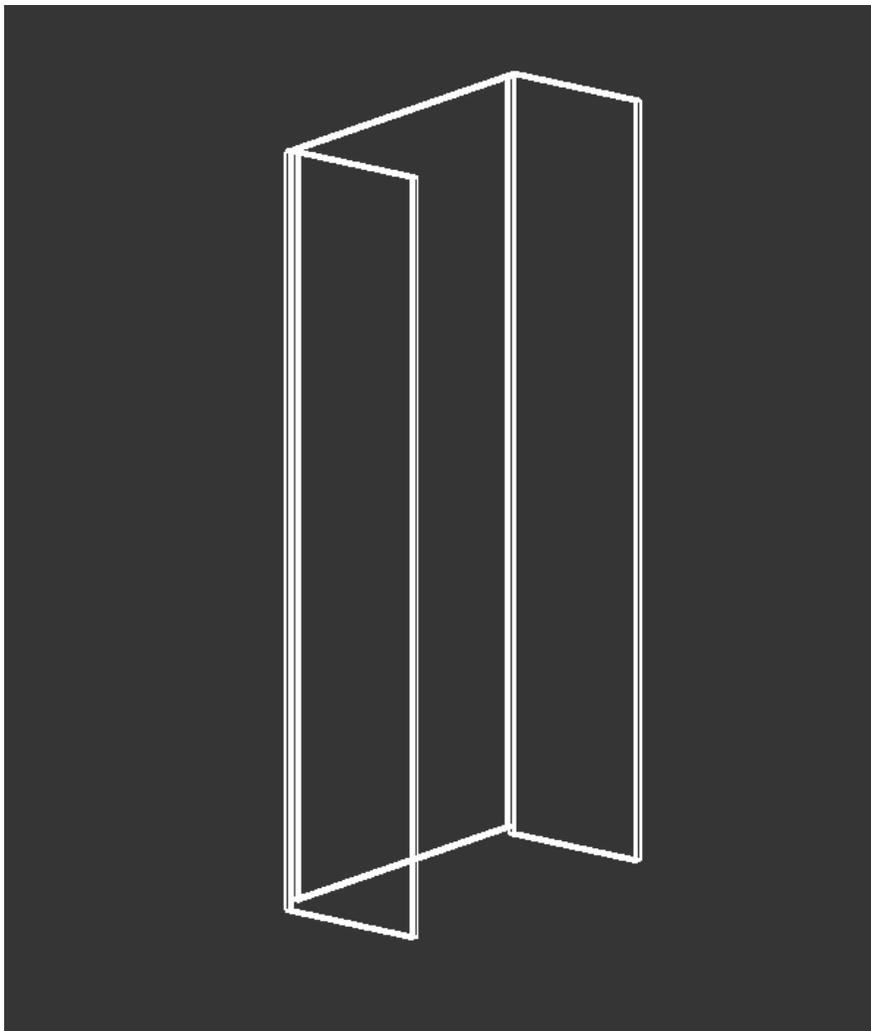


Fig 4.1.33: Book rack Wireframe Mode

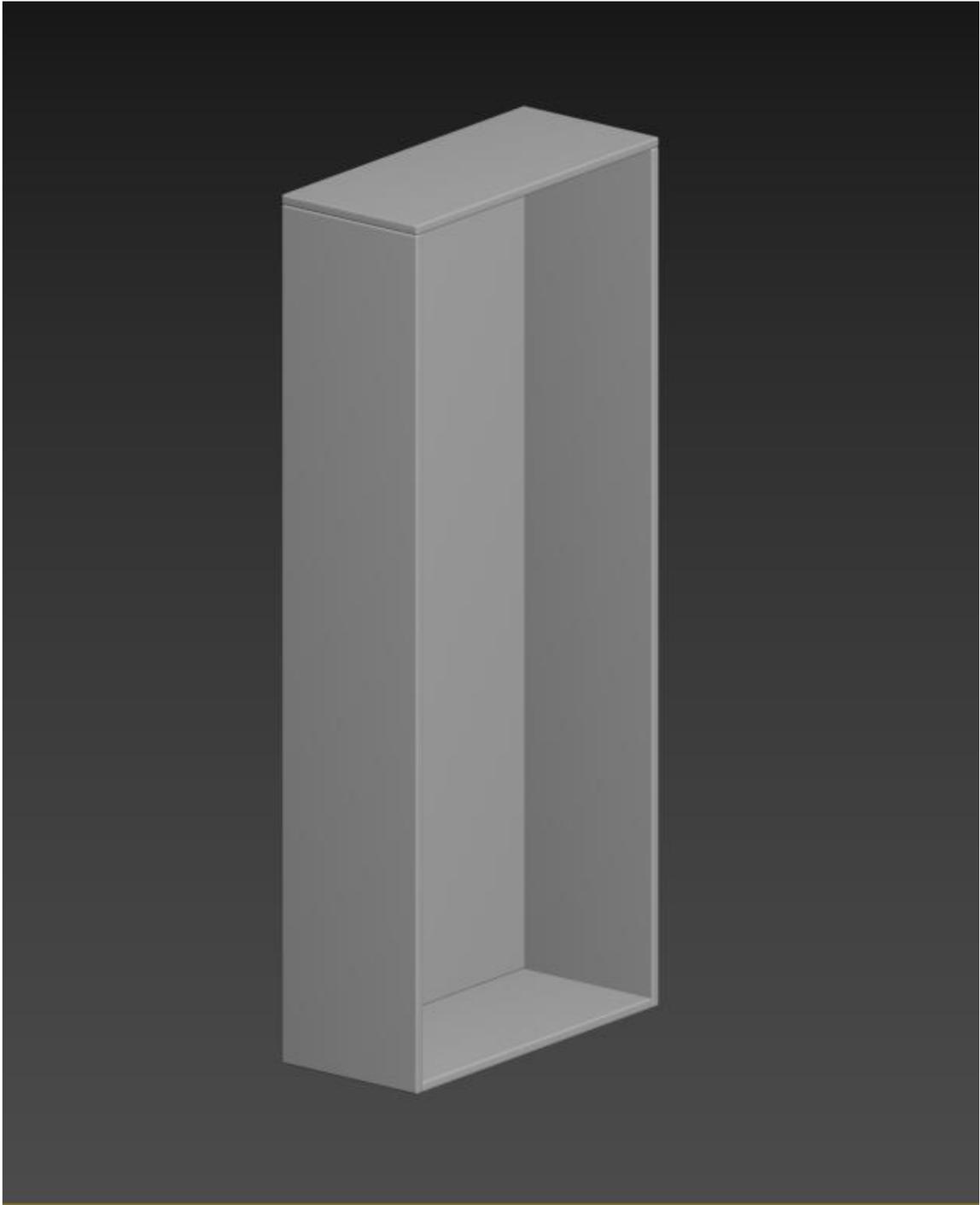


Fig 4.1.34: Book rack Modeling

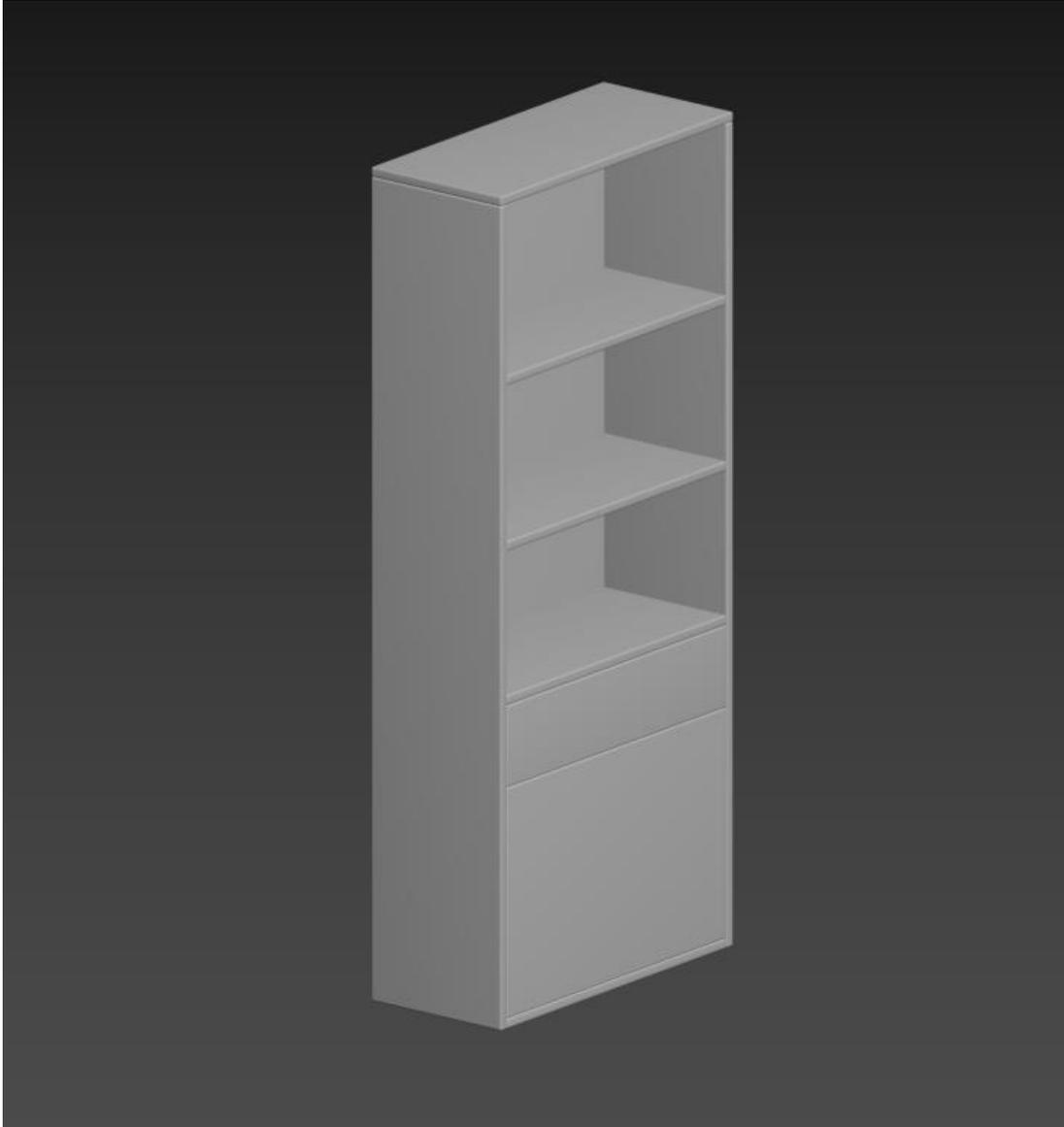


Fig 4.1.35: Book rack Modeling

This figure of the bookrack contains low to medium polygon. It's a modern bookrack which can be used in the office, house or also can be used for decorating other things.

#### **4.1.15: Couch Modeling:**

Firstly, take a box as a reference then take another box and apply edit poly on it then take the vertices move them forward.

Edit poly > select face > insert> extrude> insert> extrude. Then take another box for the sitting part. After doing this apply modifier> FFD 4x4x4 and select the vertices as needed. After all, modifier> chamfer all over the object.

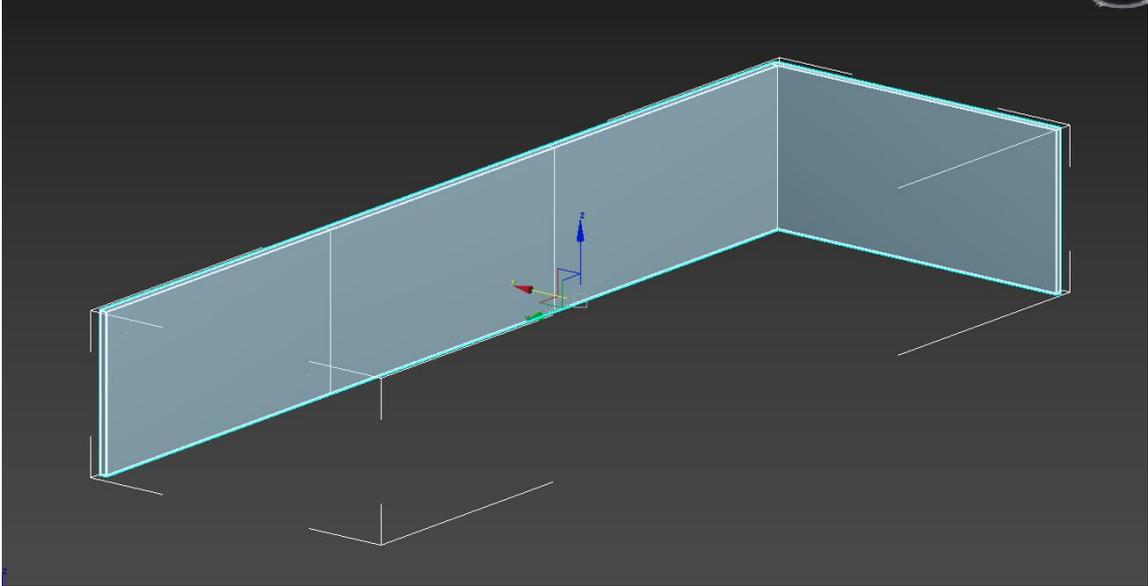


Fig 4.1.36: Couch Modeling

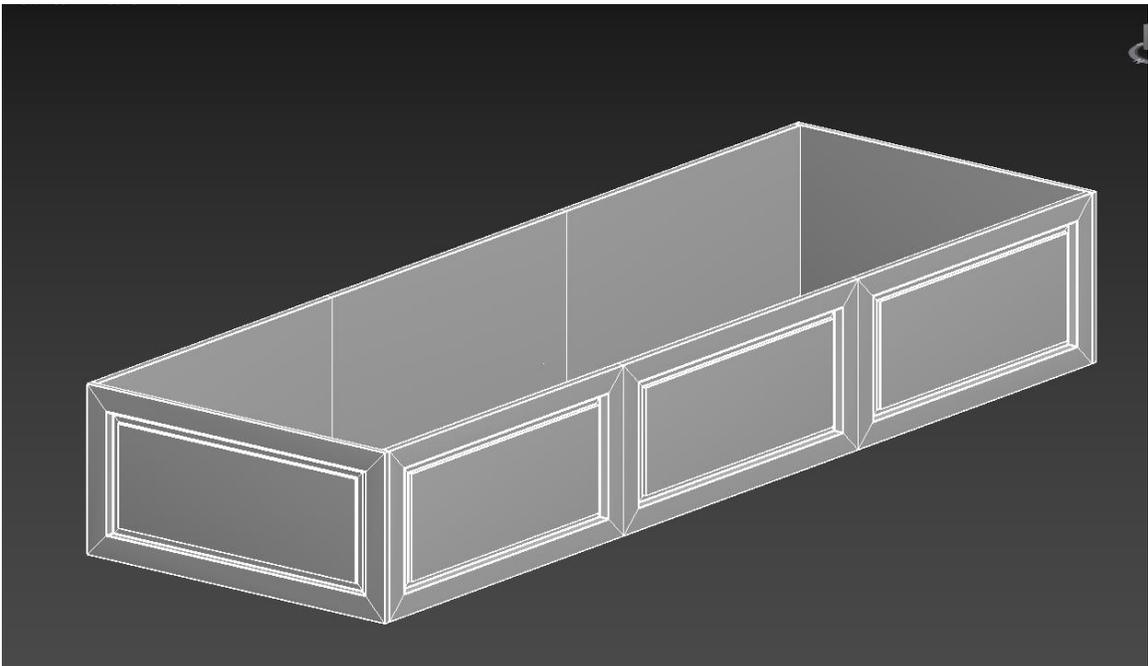


Fig 4.1.37: Couch Modeling

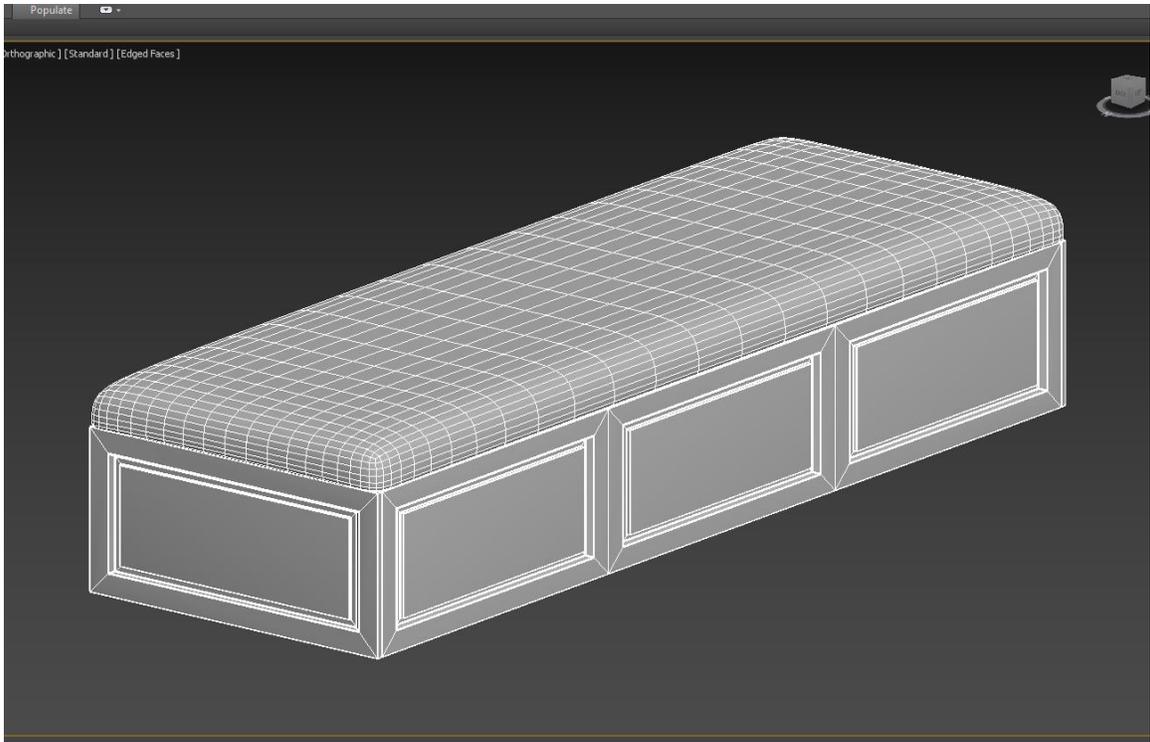


Fig 4.1.38: Couch Modeling Wireframe Mode

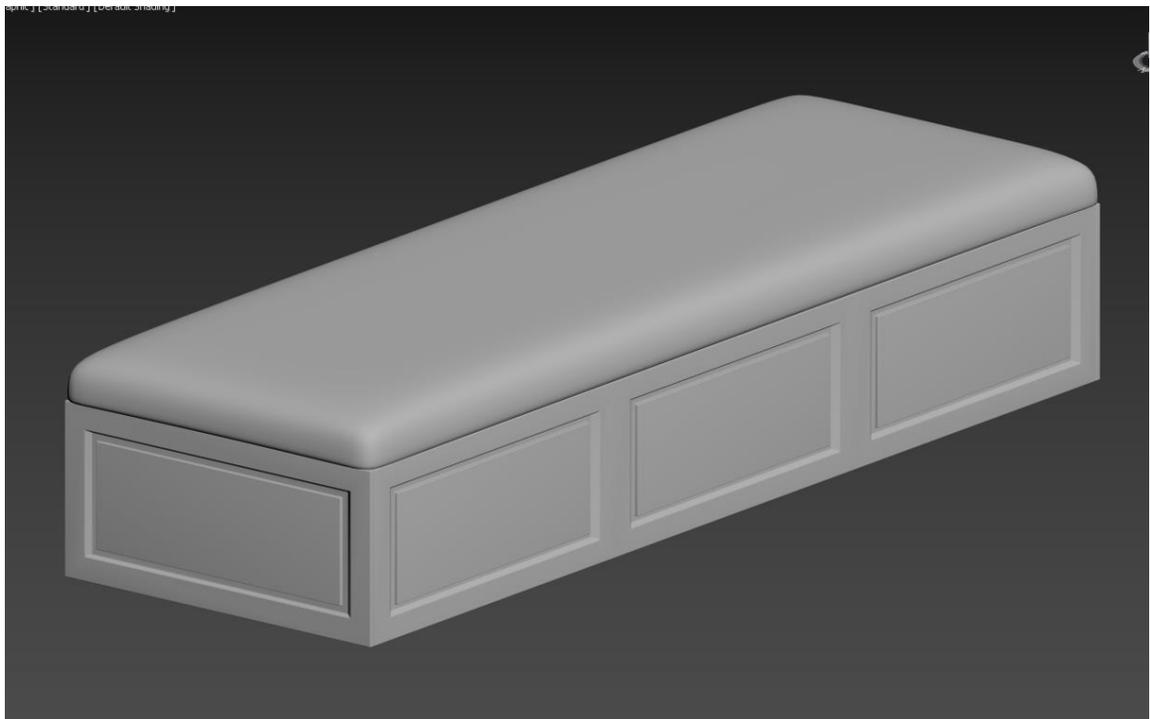


Fig 4.1.39: Couch Modeling Final

Fig:4.1.36-4.1.39 contains a couch. On the second floor of this building in the kid's study room this couch was placed near the window for relaxation and to feel the environment.

#### 4.1.16: Bed Table Modeling:

This table was created for decorating the scene. This table was created from the box. The lower part was created by box > modifier> edit poly>took the vertices and created shapes like the picture. Added another part on the upper side which is the base of this table drawer. Then go to modifier>edit poly> select face > insert> extrude> insert> extrude. And lastly added a sphere to the drawer for the opener. The sphere was also modifier by the edited poly> deleted the edges> grab the last two edges> take forward>scale> turbo smooth.

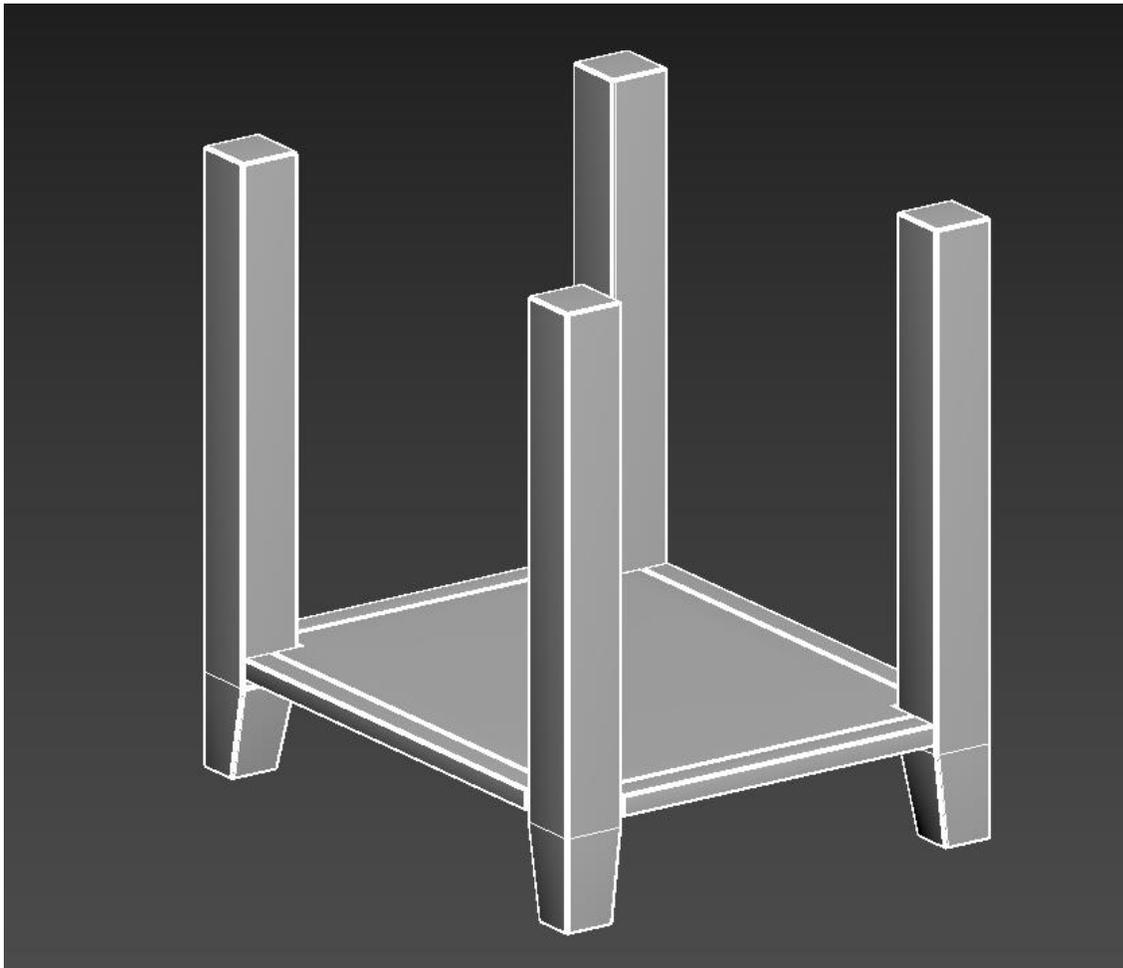


Fig 4.1.40: Bed Table Modeling

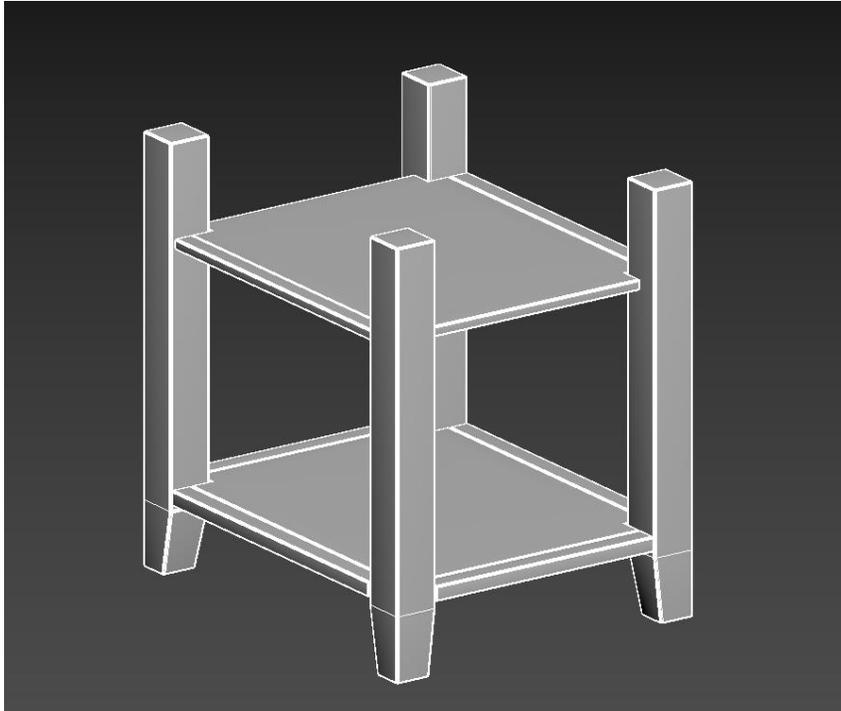


Fig 4.1.41: Bed Table Modeling

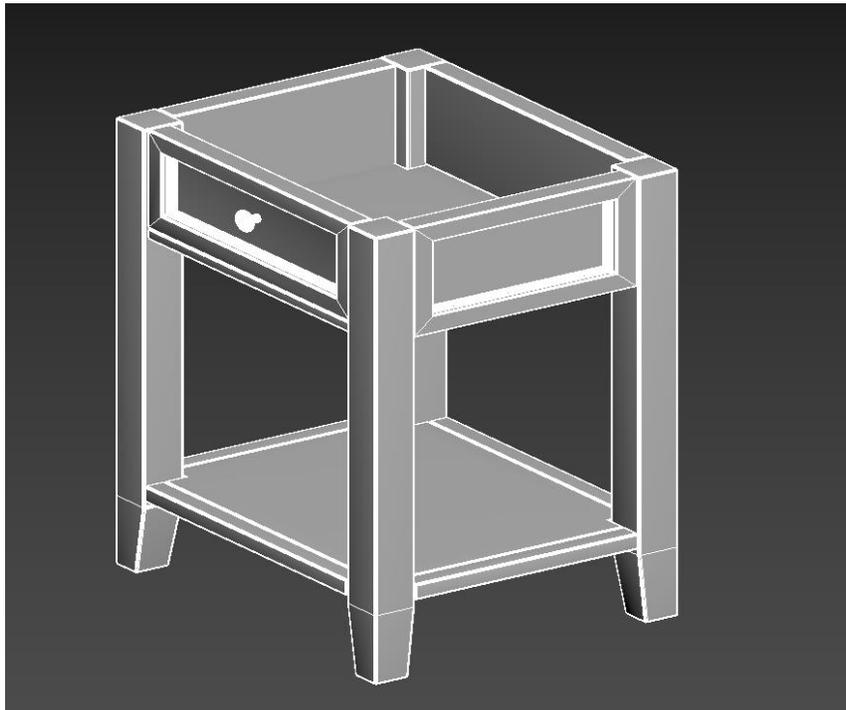


Fig 4.1.42: Bed Table Modeling



Fig 4.1.43: Bed Table Modeling

This table was placed in the kid's bed room for keeping various objects on it.

#### **4.1.17: Sofa Set Modeling:**

Firstly, take a box as a reference then take another box and apply edit poly on it then take the vertices move them forward. Edit poly > select face > extrude. Take cube for the base stand> edit poly> scale> chamfered. Modifier> chamfer box for the sitting part. After doing this apply modifier> FFD 4x4x4 and select the vertices as needed. After all, modifier> chamfer all over the object.

For the table take a rectangle> convert to spline> corner vertices> take two vertices and fillet. Take another box for the middle portion> modifier> chamfer. Copy them and set one above.

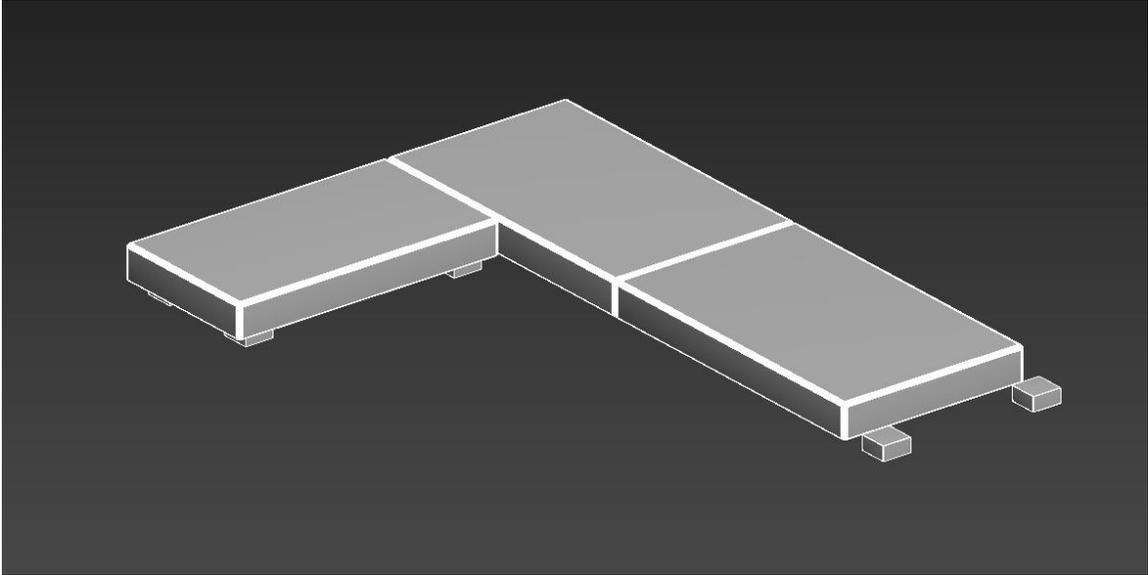


Fig 4.1.44: Sofa Modeling

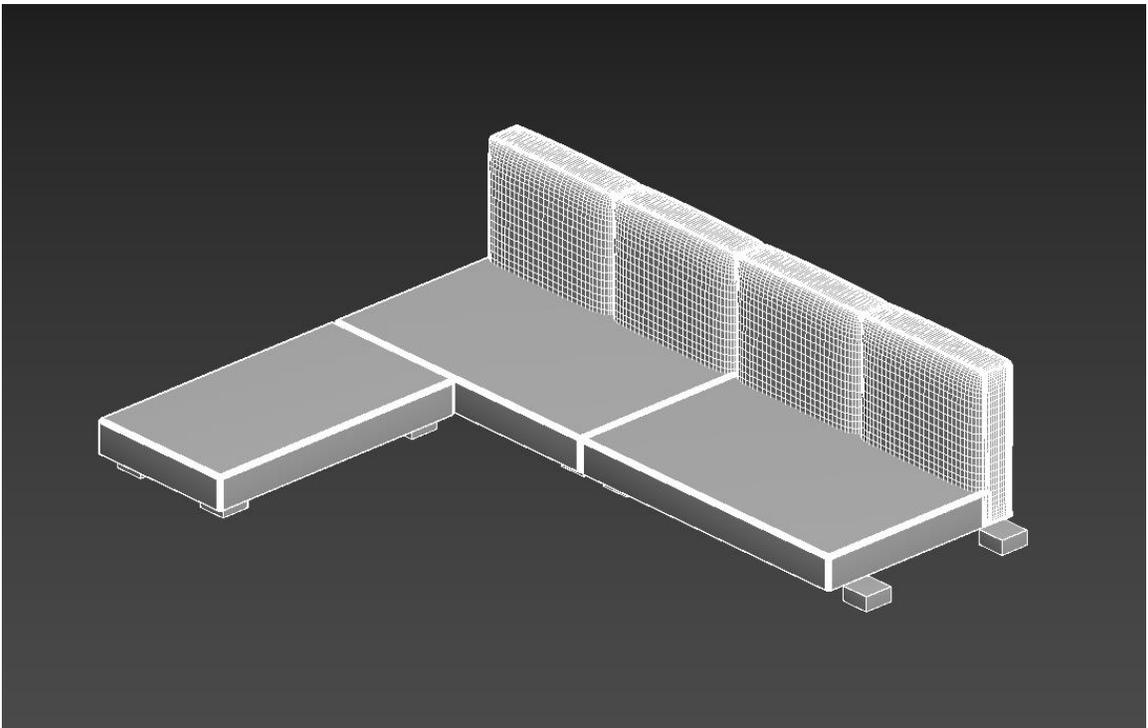


Fig 4.1.45: Sofa Modeling

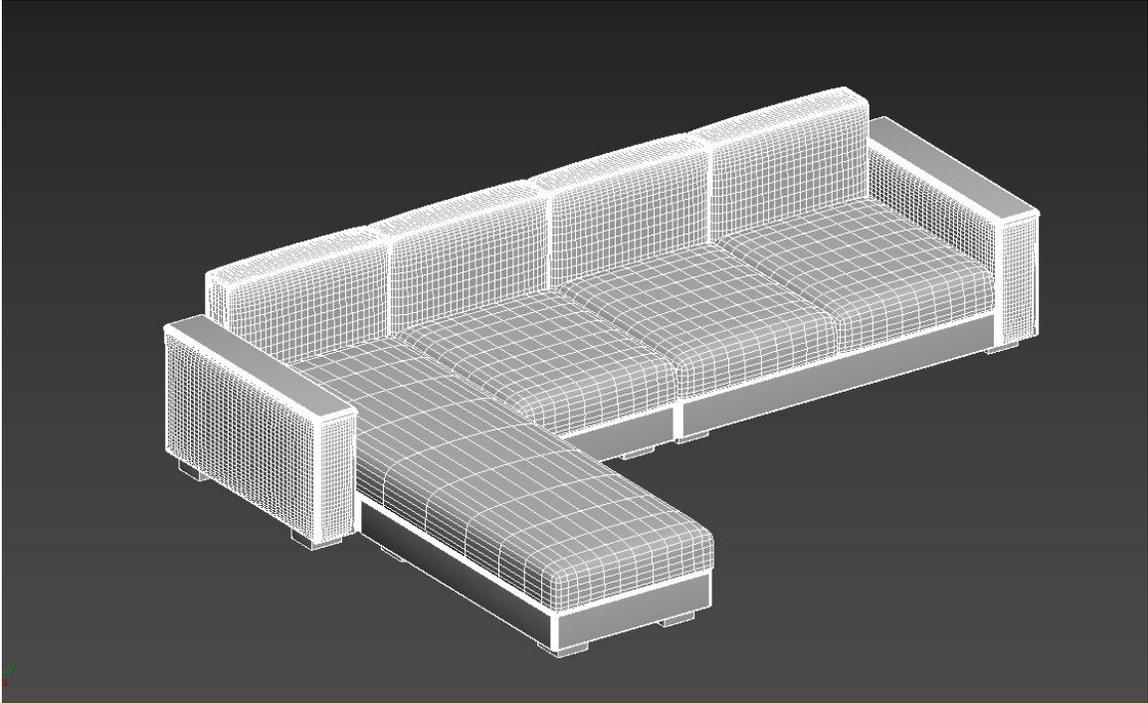


Fig 4.1.46: Sofa Modeling

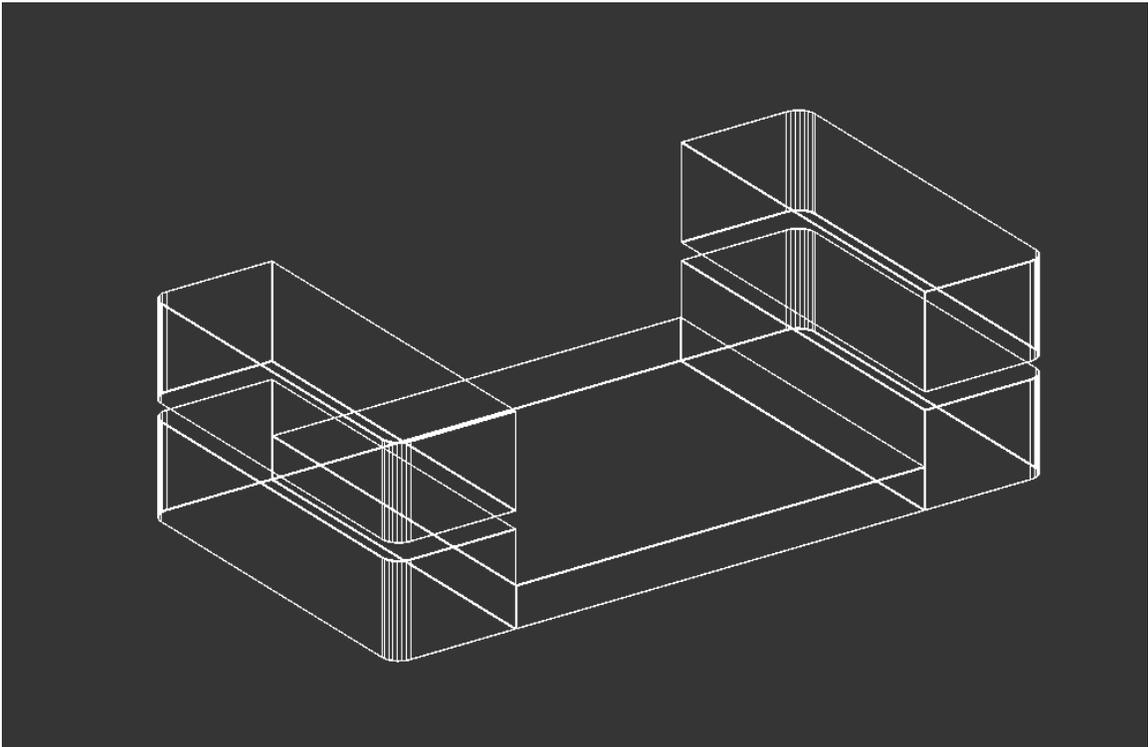


Fig 4.1.47: Sofa Table Modeling

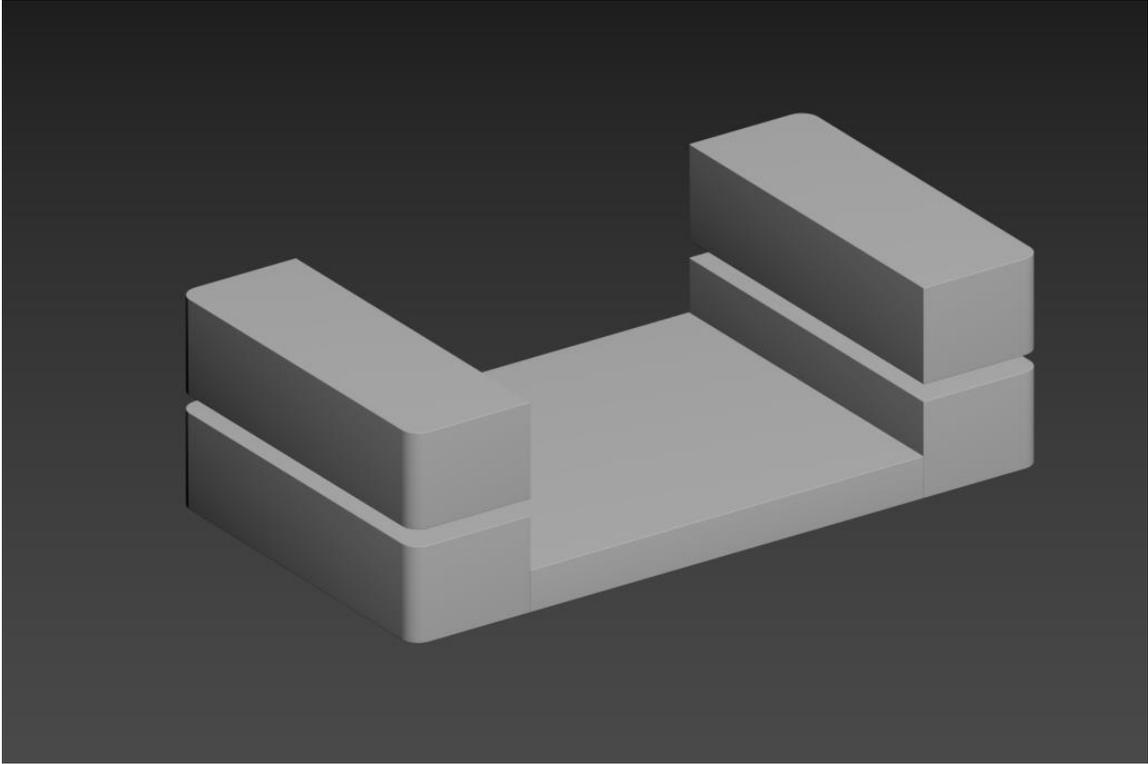


Fig 4.1.48: Sofa Table Modeling

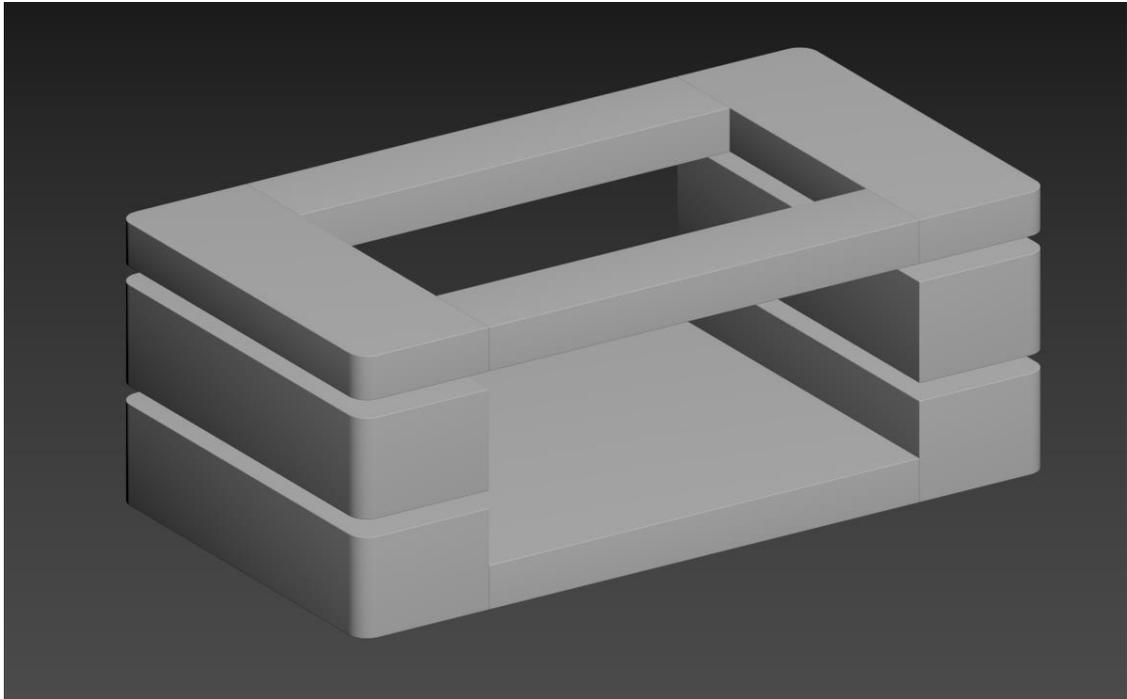


Fig 4.1.49: Sofa Table Modeling

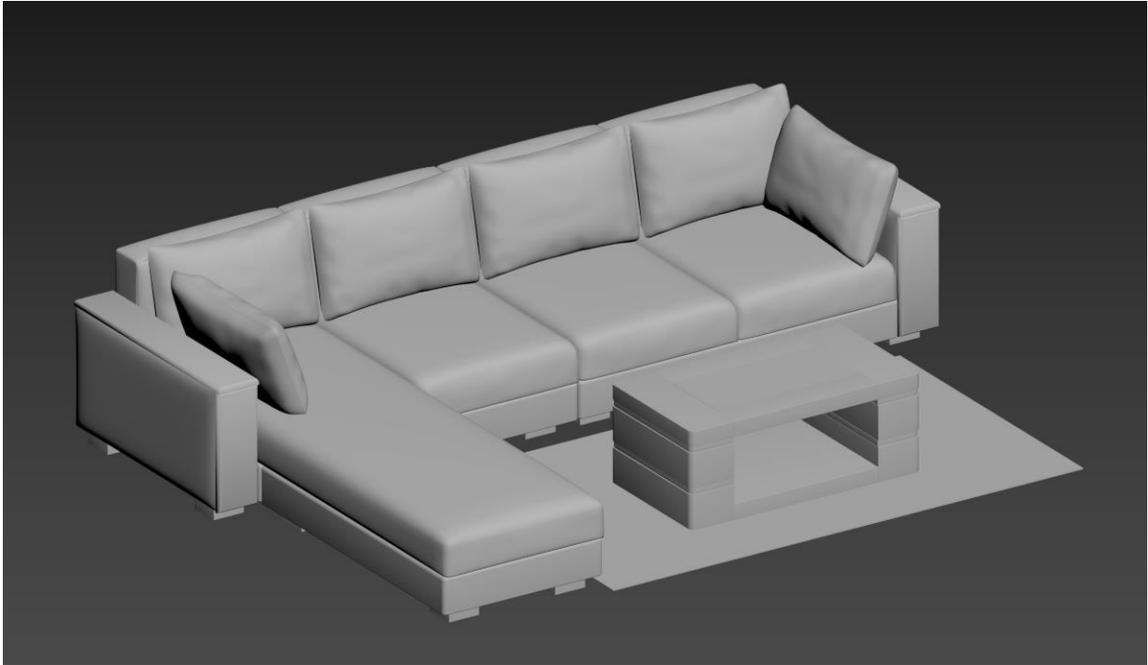


Fig 4.1.50: Sofa Set Modeling

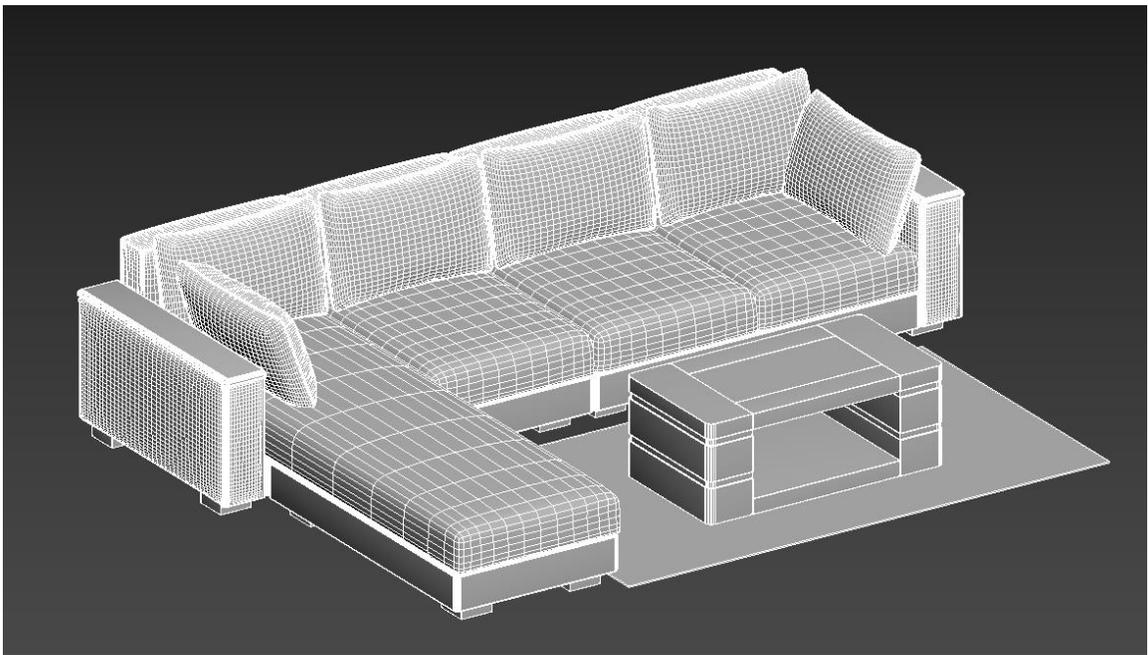


Fig 4.1.51: Sofa Set Modeling Wireframe Mode

Fig:4.1.44-4.1.51 contains a sofa set. On the first floor on the living room. Where people can seat and sharing their thoughts.

#### **4.1.18: Book Rack Modeling:**

Take a box for the measurement and after that take a rectangle to create the sides. Then Rectangle> convert to spline> and take all the vertices >and apply the corner method. Add shell modifier> to the rectangle shapes. Created the side front base back from this rectangle shape. Add another box for the middle shelf. Grab all the parts> modifier> chamfer.



Fig 4.1.52: Book Rack Modeling



Fig 4.1.53: Book Rack Modeling

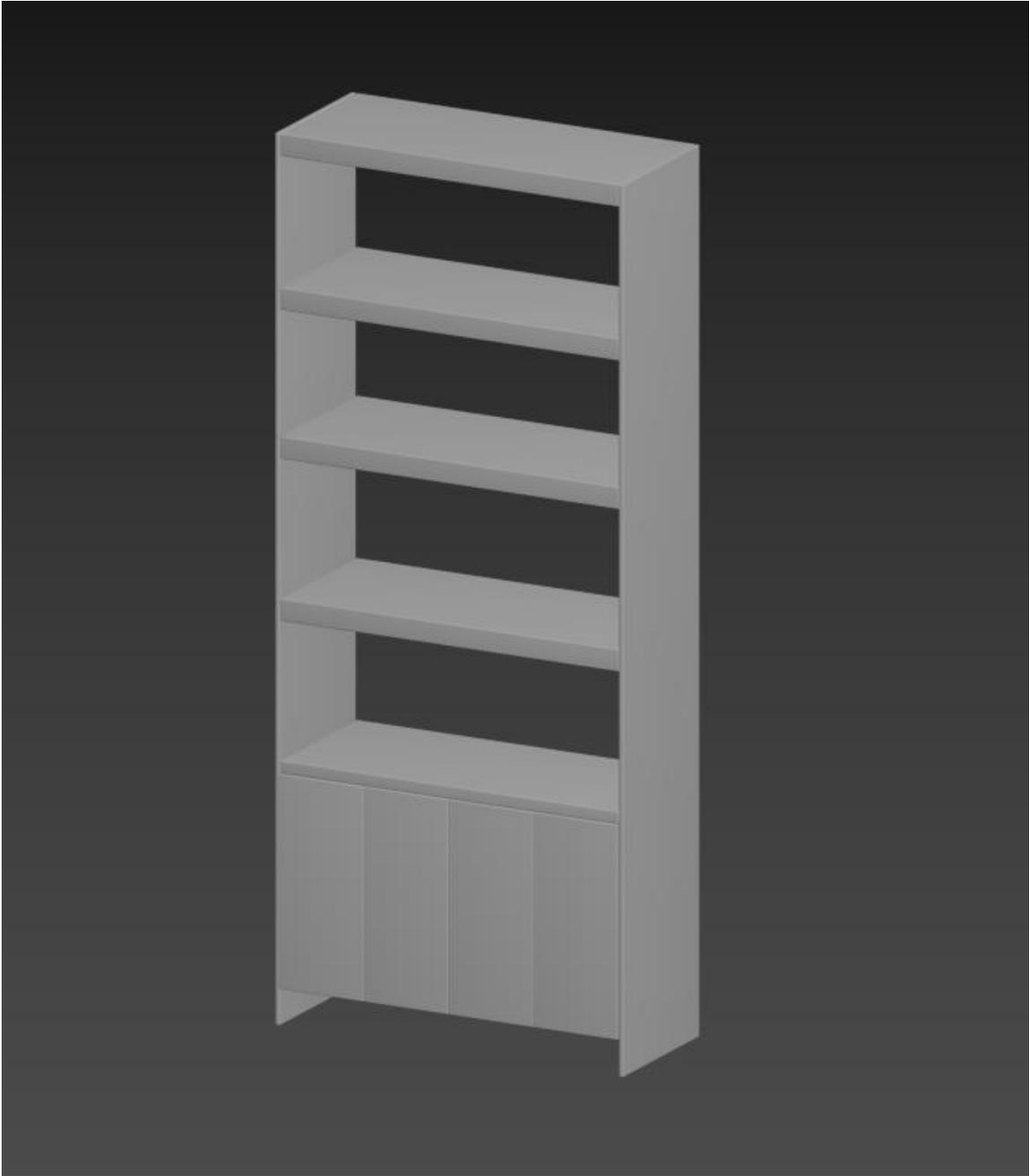


Fig 4.1.54: Book Rack Modeling

This figure 4.1.52 - 4.1.54 contains side parts and the middle shelf. After that take the back-side part and the front part to complete the book rack.

#### 4.1.19: Laundry Wear drop Modeling:

Rectangle> convert to spline> take the vertices> corner. After that take another rectangle shape and apply shell modifier>increase the value>edit poly>added edges>take one by one and >select faces> deleted faces>chamfer edges.

Take a sphere and apply edit poly> select faces> deleted> edges grab forward> scale down> turbo smooth applies on it.

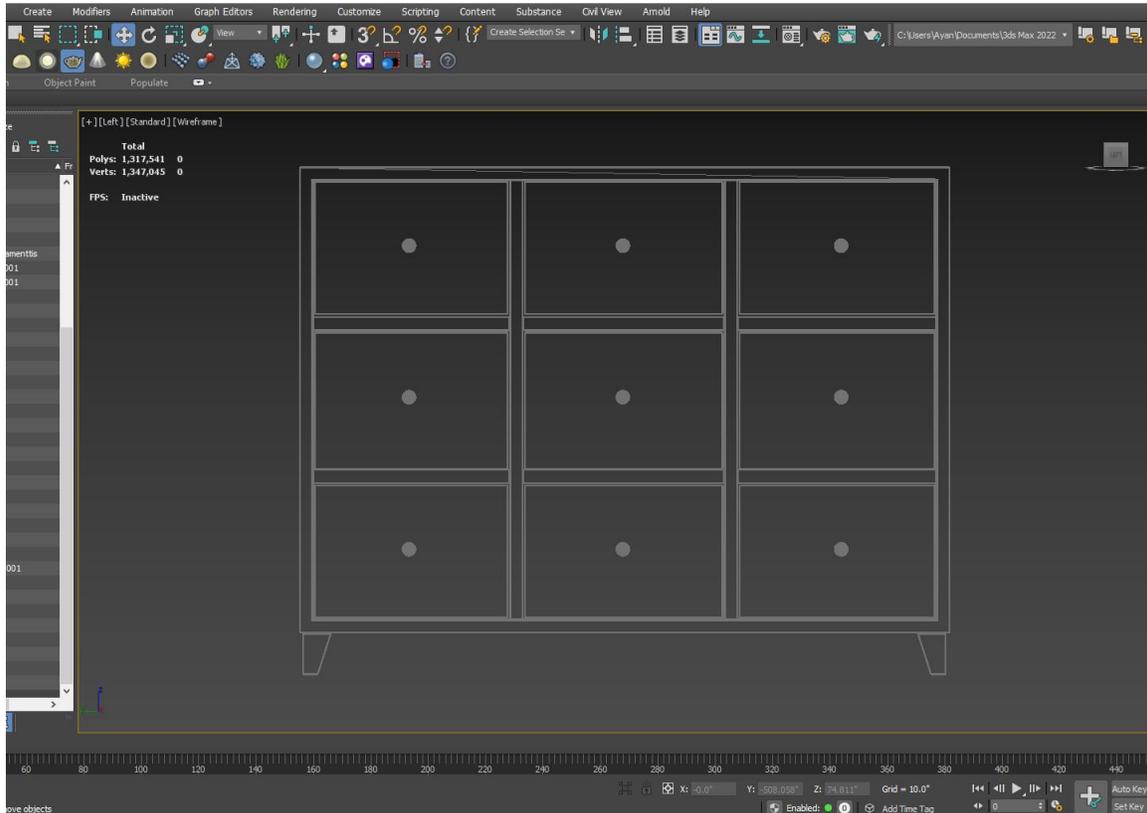


Fig 4.1.55: Wear drop Modeling

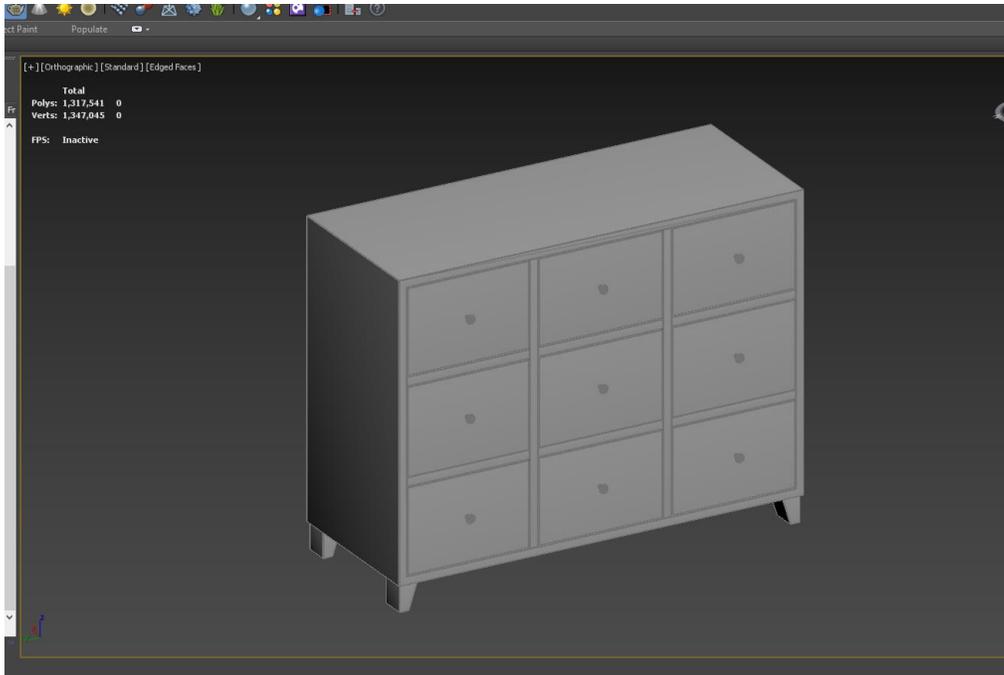


Fig 4.1.56: Wear drop Wireframe Modeling

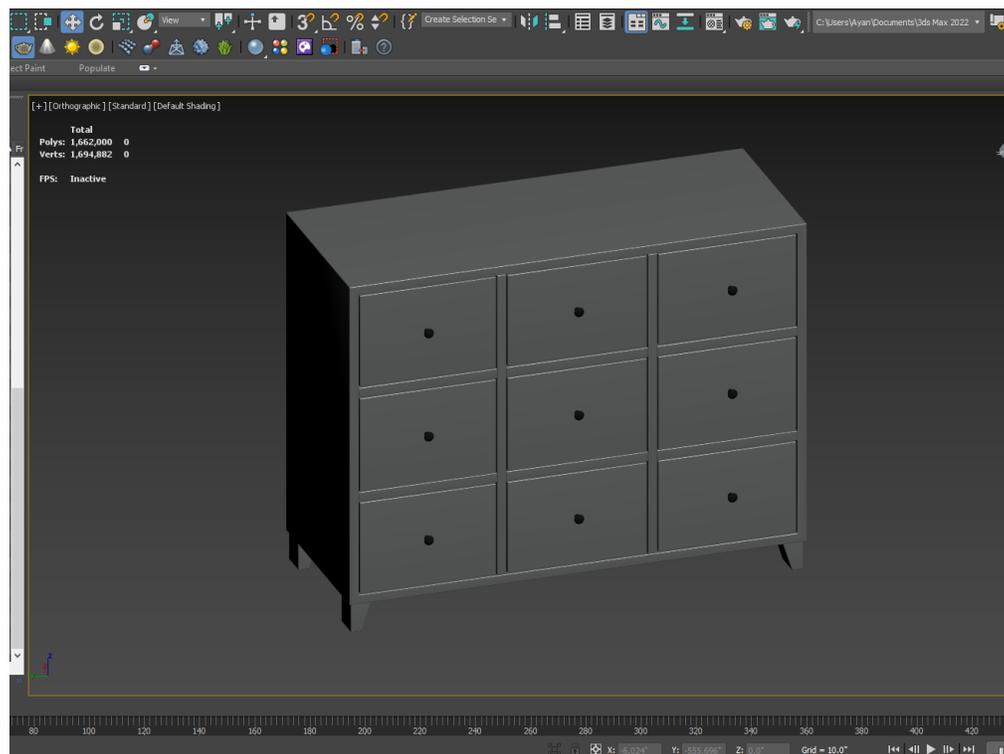


Fig 4.1.57: Wear drop Modeling

This figure 4.1.55 - 4.1.57 contains the object where using rectangle and make this model easily with a low polygon count.

#### 4.1.20: Decoration Tool Modeling:

Take a line from the shape > convert to the spline> corner the vertices> take the between vertices and apply fillet on it. Up down the vertices as we needed. Lastly apply chamfer to the whole model.

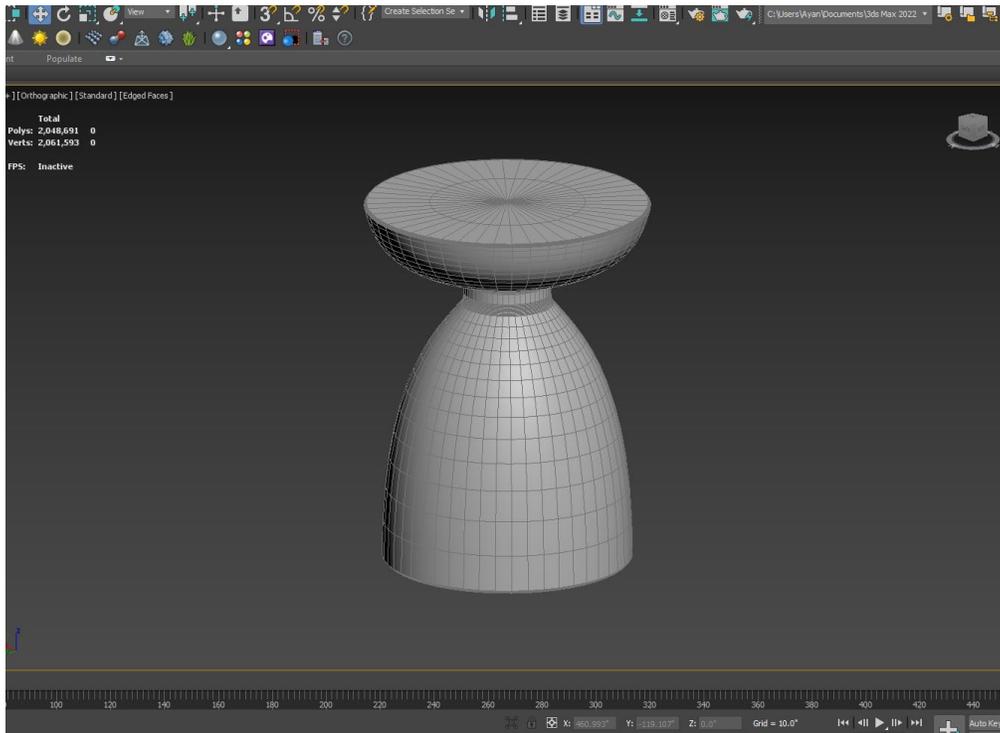


Fig 4.1.58: Decoration Tool Wireframe Modeling

It can be using in a multiple way. Though it was placed in the middle of the sofas in the living room for decorating the scene.

#### 4.1.21: Fire Place Side Table Modeling:

This table was created for decorating the scene. This table was created from the box. The side part was created by box > copy> take to another side> copy>rotate to the upper side> modifier> edit poly> modifier> chamfer.

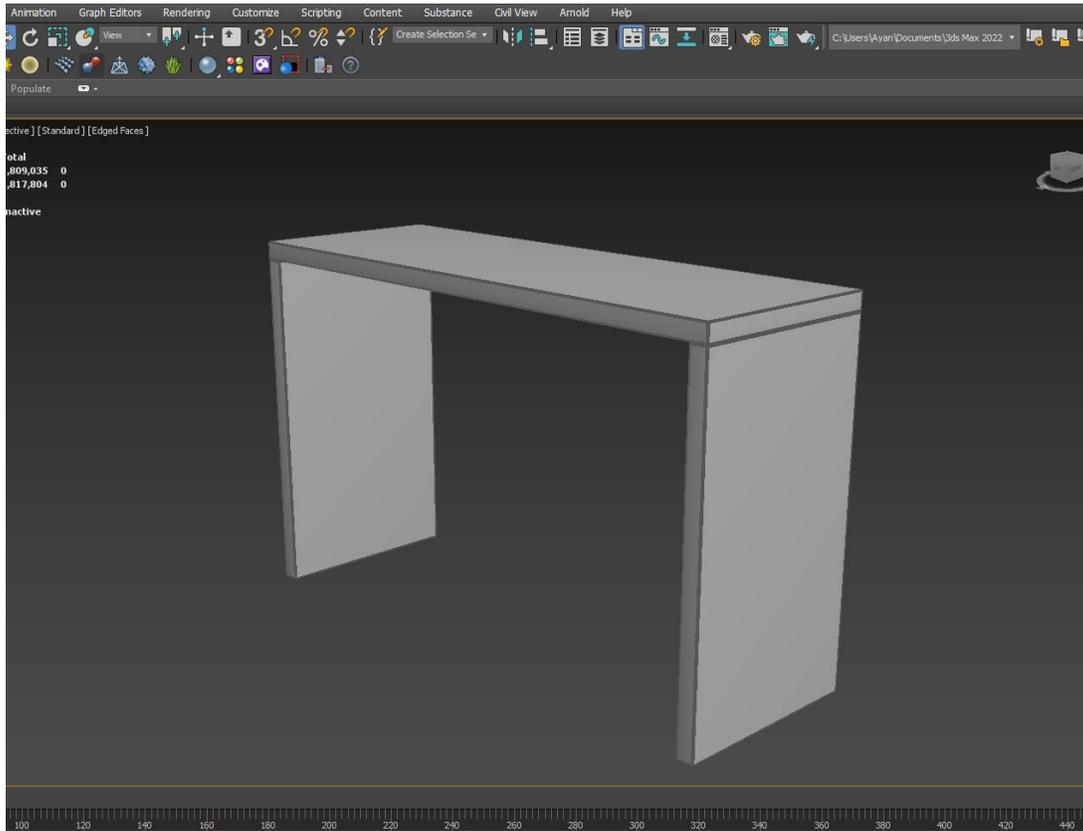


Fig 4.1.59: Table Wireframe Modeling

This table is using besides the fire place in the apartment.

#### 4.1.22: Sofa Table Modeling:

This table was using in the middle of the sofa set. This table was created from the box. The side part was created by box > copy> take to another side> copy>rotate to the upper side> modifier> edit poly> modifier> chamfer.

Take a rectangle for the base part> convert to the spline>corner the vertices> take the part together> apply chamfer to the edges.

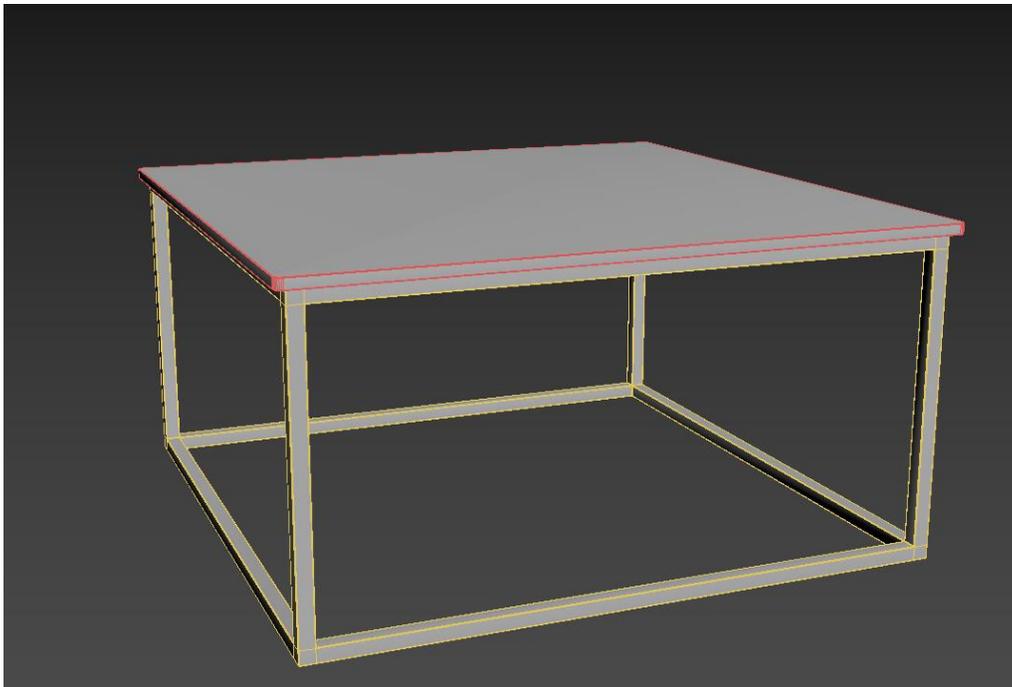


Fig 4.1.60: Table Wireframe Modeling

This model is using for the sofa set complimentary.

#### **4.1.23: Sink tap Modeling:**

Take the refence file first then chose a cylinder> modifier> edit poly> bevel> scale down>deleted the bottom faces>chamfer to edges.

Take another cylinder for the handle also apply the same process. Add some more objects to make this properly. Before applying turbo smooth view this wire frame mode by pressing F4. Then applying the turbo smooth for more smoothness to the object.

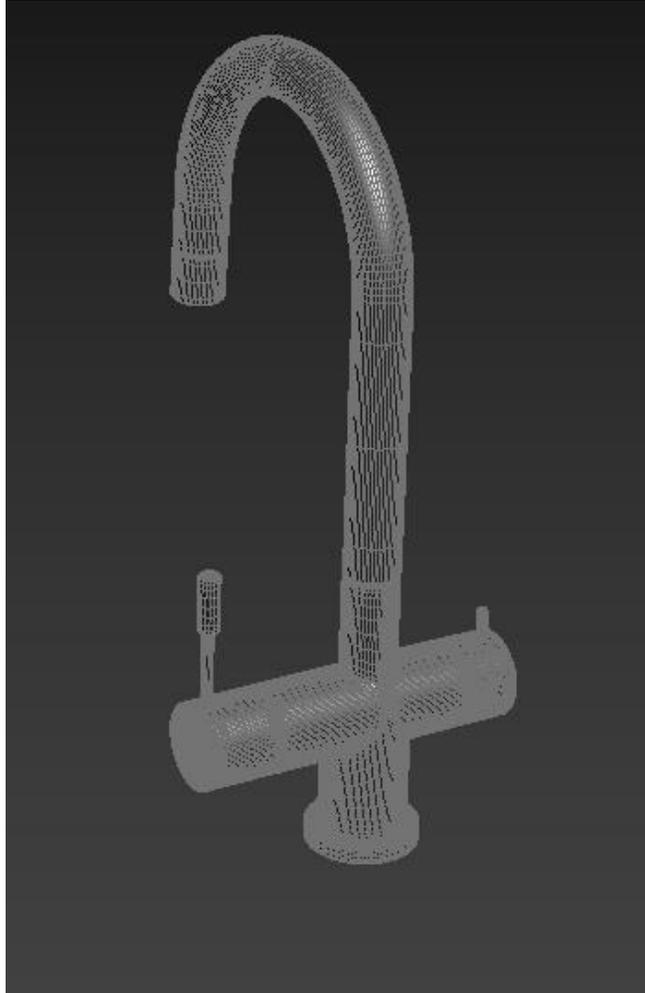


Fig 4.1.61: Kitchen Sink Wireframe Modeling

This model is using in the kitchen sink. For detailing it contains little bit high poly.

#### **4.1.24: Kitchen Towel Modeling:**

For this kitchen tissue I am going to using a cylinder as the main base or which we call the roll then take another cylinder for the handle and take a sphere> modifier> edit poly> deleted the last faces and hold the border and scale it and reduce the size and grab over the cylinder.

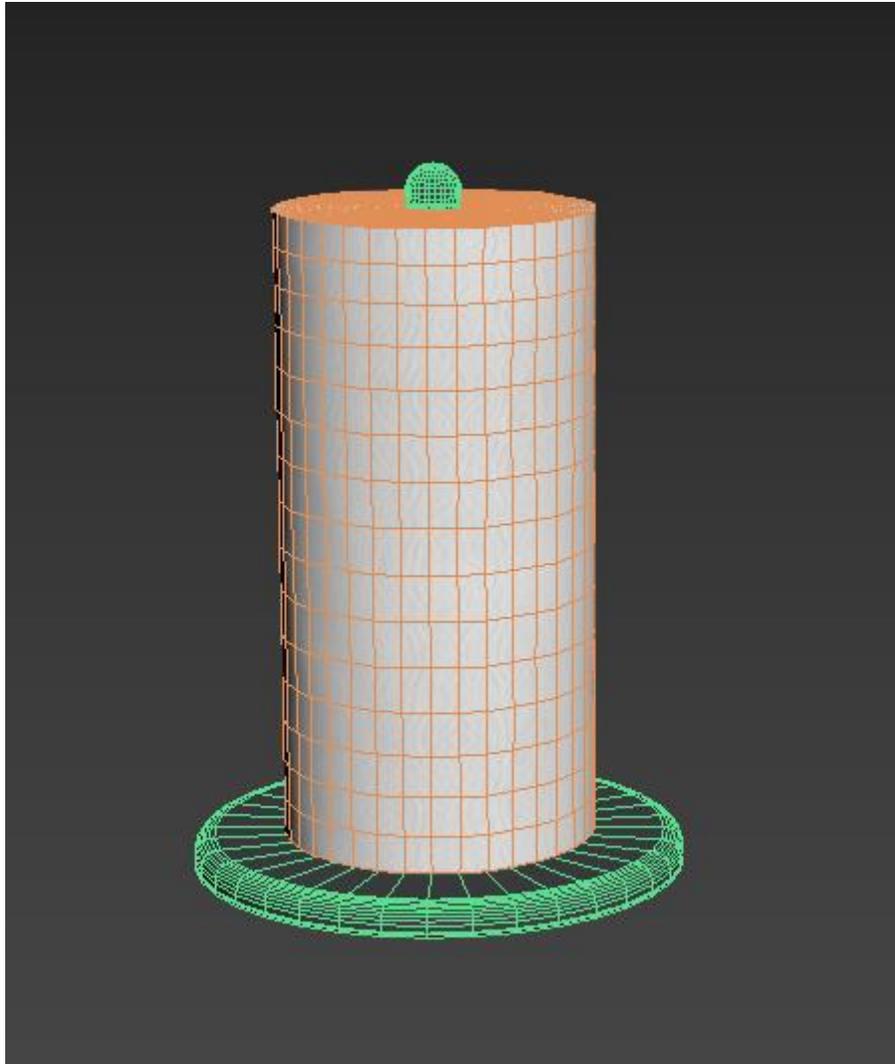


Fig 4.1.62: Kitchen Towel Wireframe Modeling

For the bottom part take another cylinder> edit poly> take the upper faces> scale size. Then all the objects attach together. And lastly apply the chamfer to the edges for smoothness.

#### **4.1.25: Cup Modeling:**

Take a cylinder> modifier> edit poly> delete faces from the top and bottom> take the edges and scale it to the outside then increase the size and decrease the lower size. For the handle

take a line> draw it as a handle the go to the rendering view from the panel> allow the option rendering view and display to the viewport.

Cup>select the two faces where the handle was placed then > edit poly> insert> deleted faces> take the border and also the handle border and apply bridge from the modifier panel. Lastly apply turbo smooth to the model for a better view.



Fig 4.1.63: Cup Wireframe Modeling



Fig 4.1.64: Cup Modeling

This is the final picture of this model which carry quad polygons.

#### **4.1.26: Kitchen Cabinet Modeling:**

Take a box> edit poly>add segment> chamfer each edge> take each face> insert>extrude.

For the handle take a line> convert to the spline > corner vitrics> take two vertices and fillet this two sides.

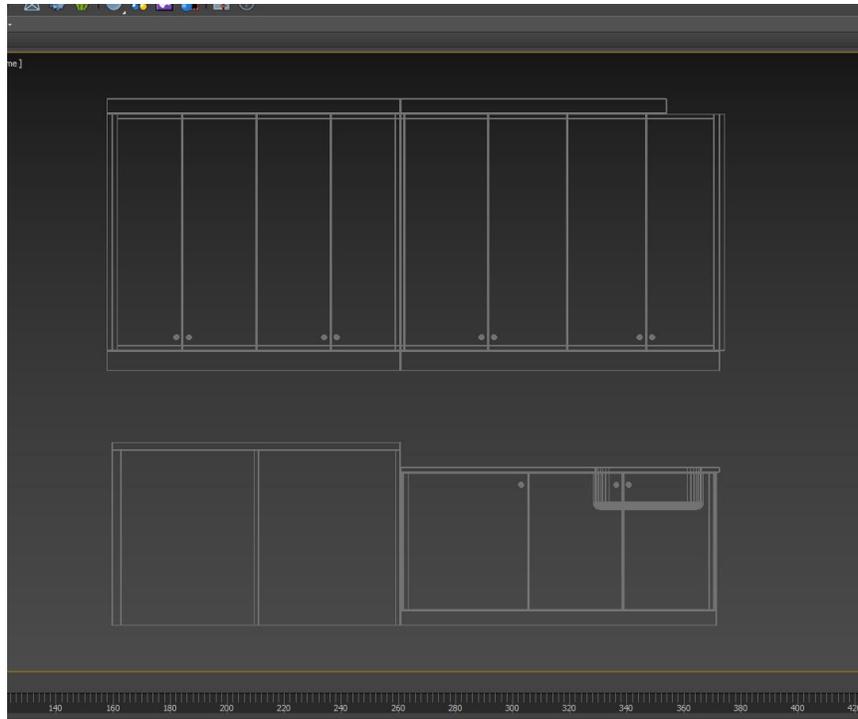


Fig 4.1.65: Kitchen Cabinet Front View Modeling

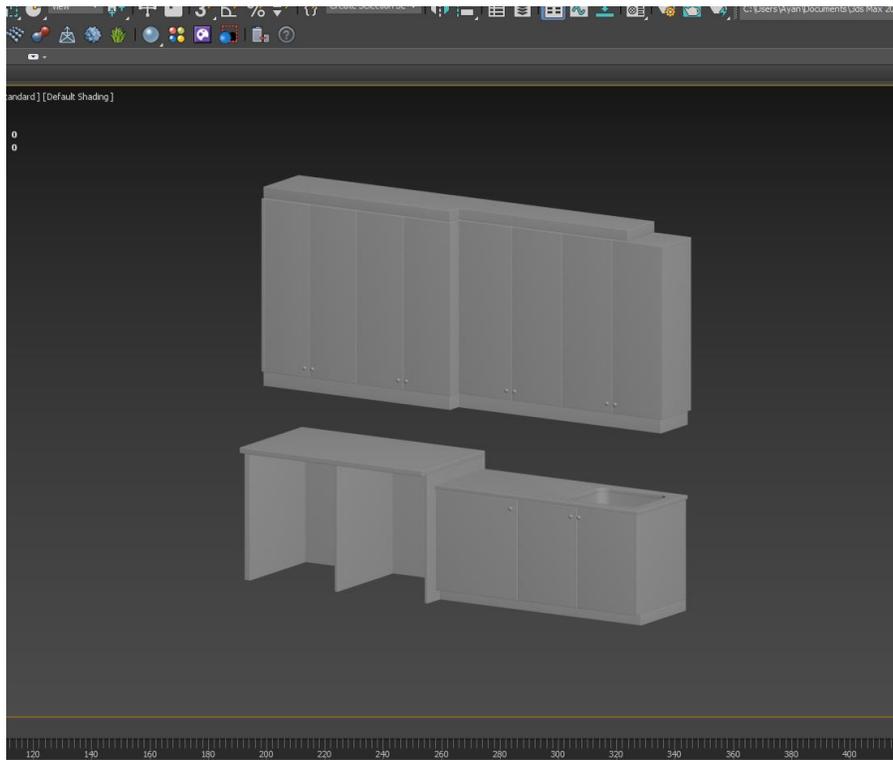


Fig 4.1.66: Kitchen Cabinet 3D View Modeling

#### 4.1.27: Plate Modeling:

Take a line and draw half of the plate shape > convert to spline > adjust vertices > fillet middle vertices for round the sides > go to modifier > lathe modifier > then adjust the value. For smoothness increase the segment > then go to modifier > apply smooth modifier.

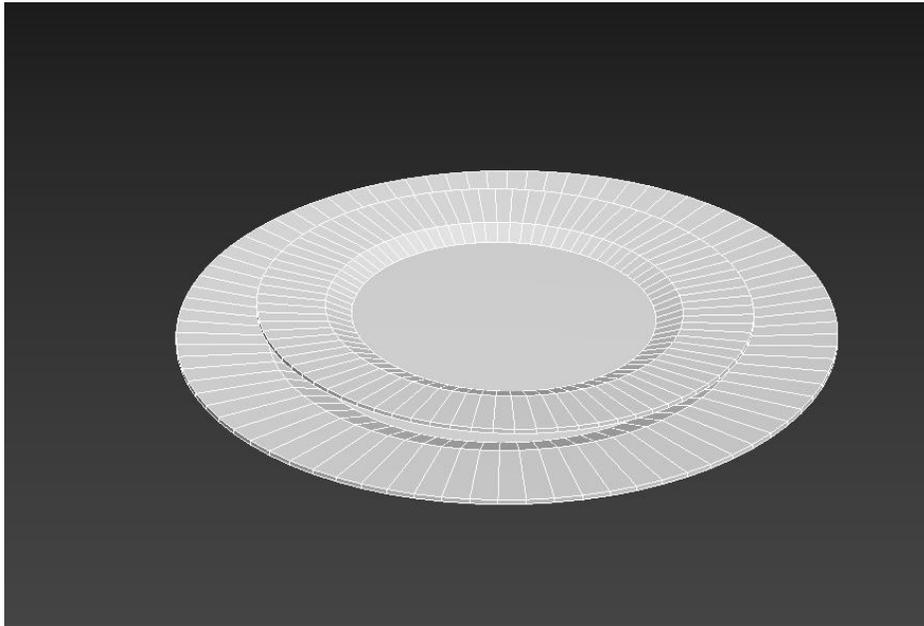


Fig 4.1.67: Kitchen Object Modeling Wireframe

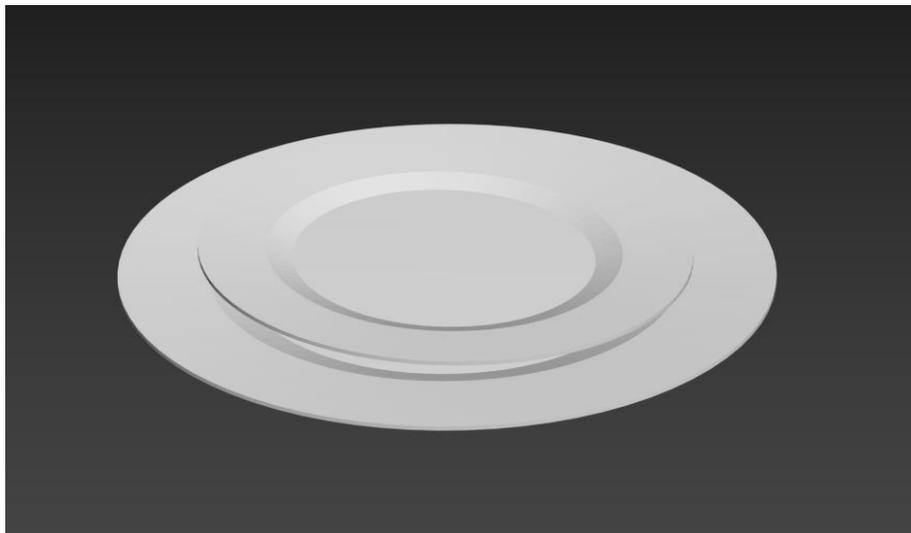


Fig 4.1.68: Kitchen Object 3D View

#### 4.1.28: Bowl Modeling:

Take a sphere > go to modifier > edit poly > and deleted half of the shape > take the last vertices and scale it down little bit> decrease the size of the bowl> apply shell modifier > then adjust the value. Added the lower part take the faces> extrude> scale size.

For smoothness increase the segment > then go to modifier > apply turbo smooth modifier.

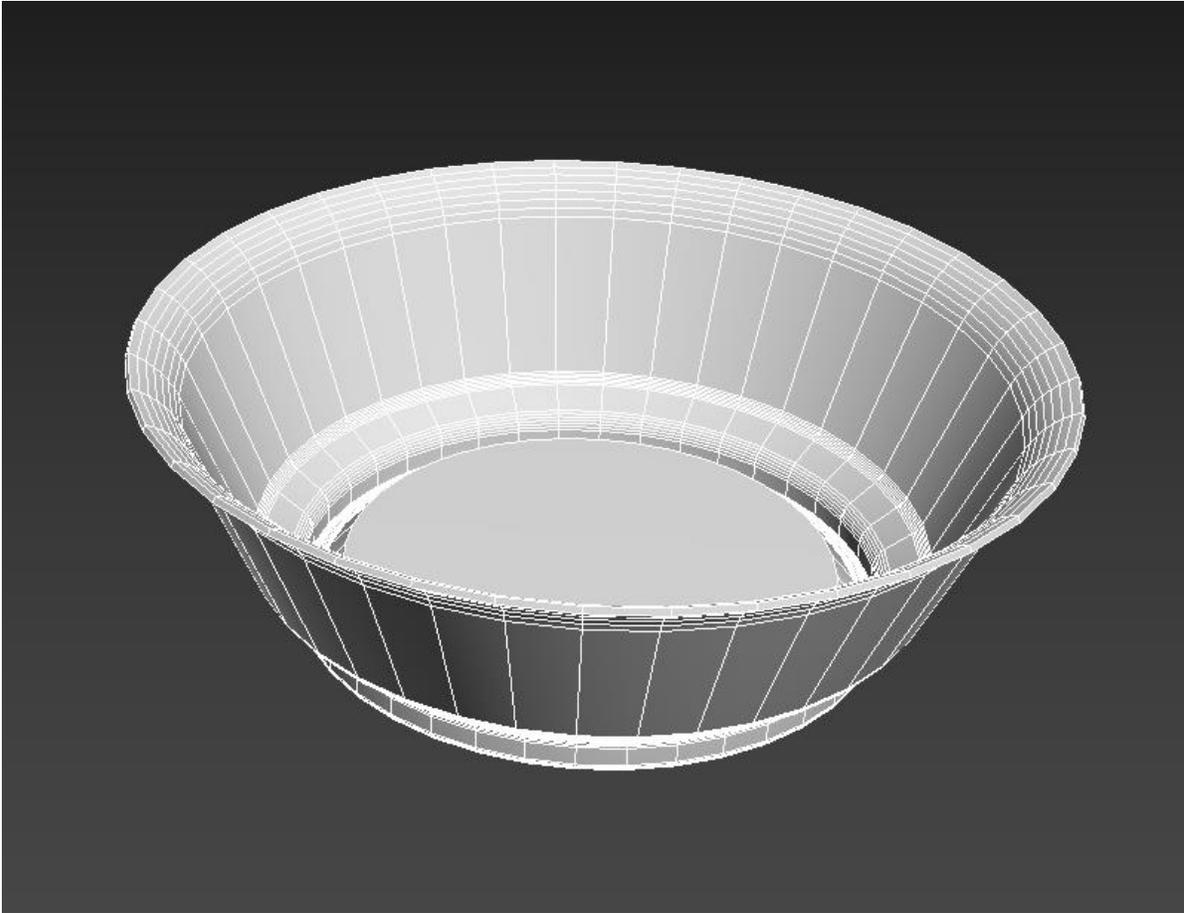


Fig 4.1.69: Kitchen Object Wireframe View



Fig 4.1.70: Kitchen Object Bowl

These two pictures are containing a kitchen object modeling one is wireframe view and the other one is 3D view.

#### **4.1.29: Window Modeling:**

A window is some several corridors basically used in several models. Have to model several windows. I made it simpler for several scenes. I modeled simple windows using box and rectangle and lattice modifier applied in other scenes. Tried to make an actually lightweight poly cube design model just to make the model lighter to help it from viewport an assembly crash. For the border take another rectangle apply chamfer to it.

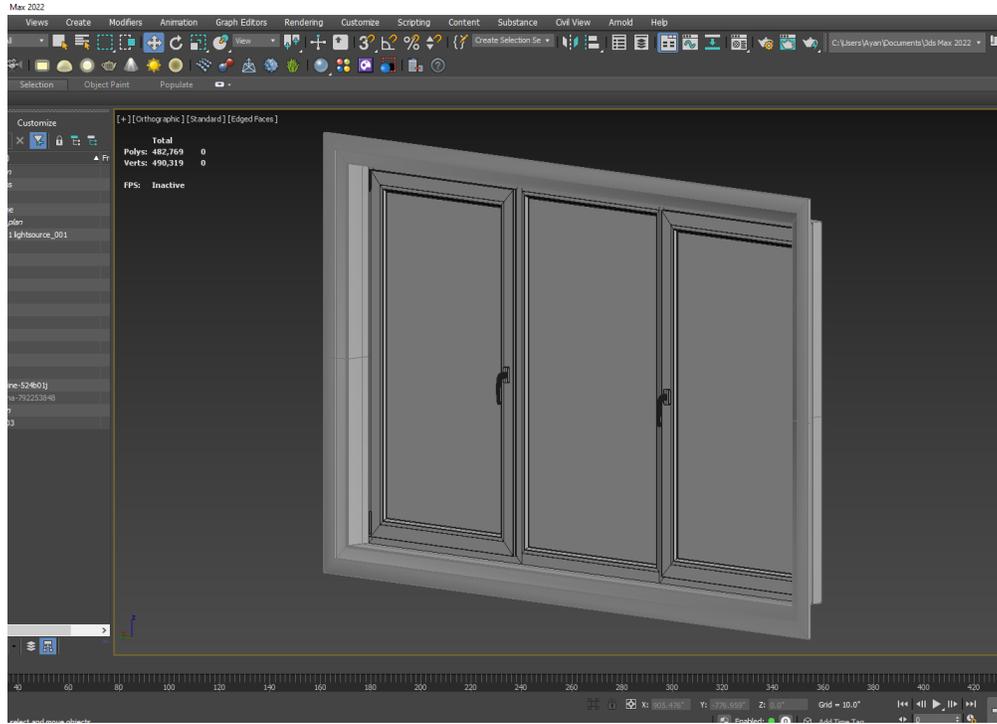


Fig 4.1.71: Window Modeling

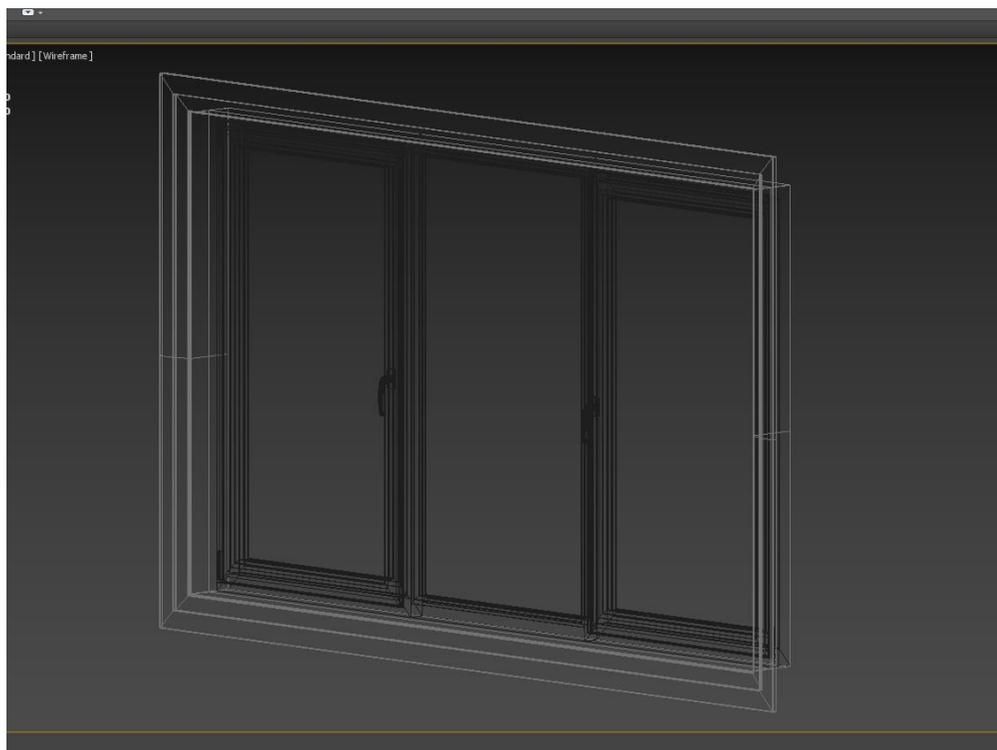


Fig 4.1.72: Window Wireframe View

## 4.2: UV Unwrap:

Unwrap is one of the popular methods for doing UV of any 3d object. UV means representing a 3d object's face with a flat 2d face. It's used to texture 3d objects smoothly. This process of creating a UV map is called UV unwrapping. Then the U and V represent two axes of the 2d space. And in the 3d space, there are three (X, Y, Z) axes represent 3 different directions.

### 4.2.1: Bookshelf:

For this object I am using UVW Map. Which is quite easy for the box shape objects. Select the part by part and going to the modifier panel > UVW Map apply > choosing the parameter as needed.

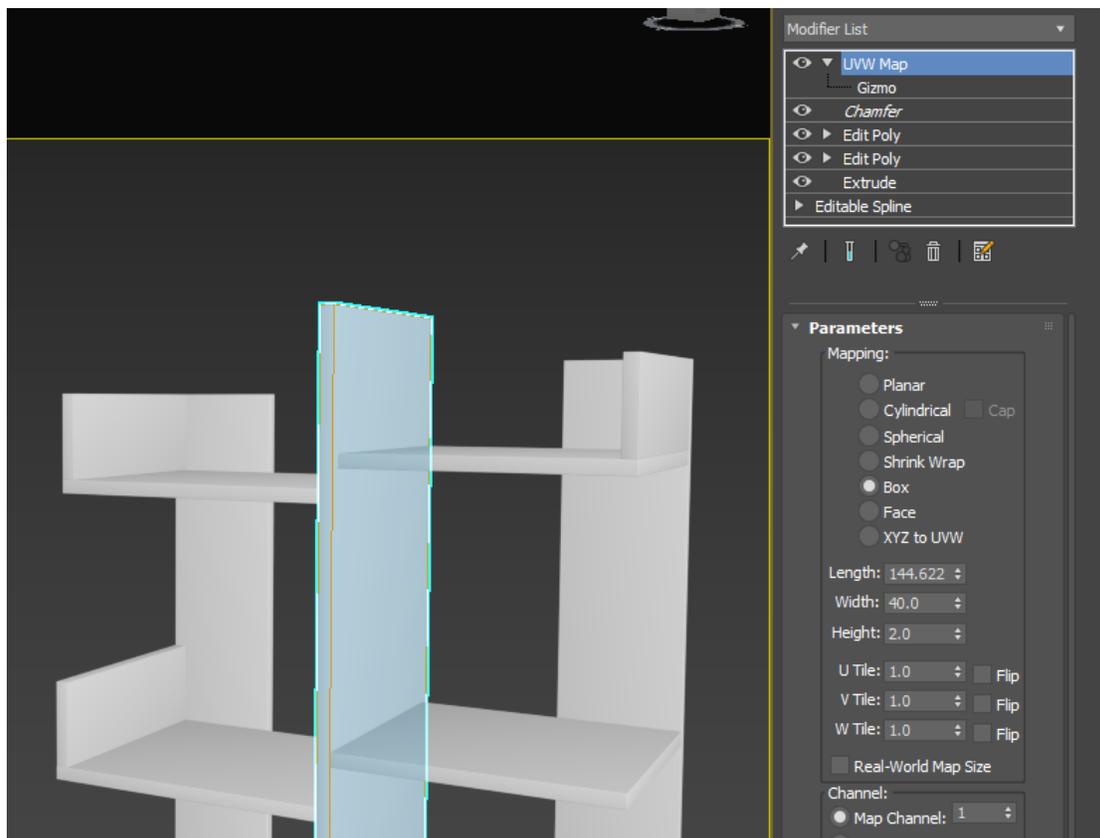


Fig 4.2.1: Bookshelf Unwrap

After applying texture then I need to apply the UVW Map and scale the gizmo to match the block size so it looks seamless.

#### 4.2.2: Table:

For this object I am using again UVW Map. Which is easy for the box shape objects. Select the part by part and going to the modifier panel> UVW Map apply> choosing the parameter> box then adjust the length, width, height as needed.

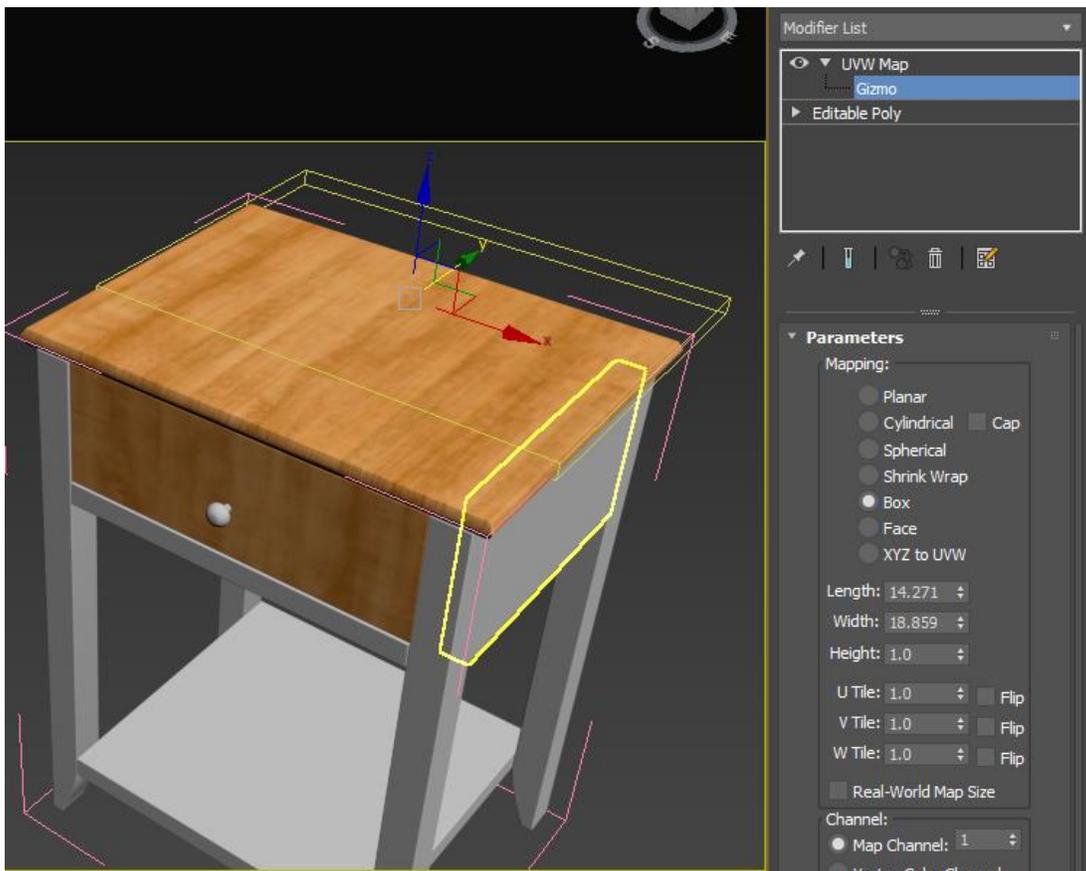


Fig 4.2.2: Table Unwrap

### 4.2.3: Wear drop:

For this object I am using again UVW Map. Select the part one by one and going to the modifier panel> UVW Map apply> choosing the parameter> box then adjust the length, width, height as needed. Also, this UVW map can be copy by clicking the right side of the mouse and paste on the another one so we not need to apply the same thing again and again.

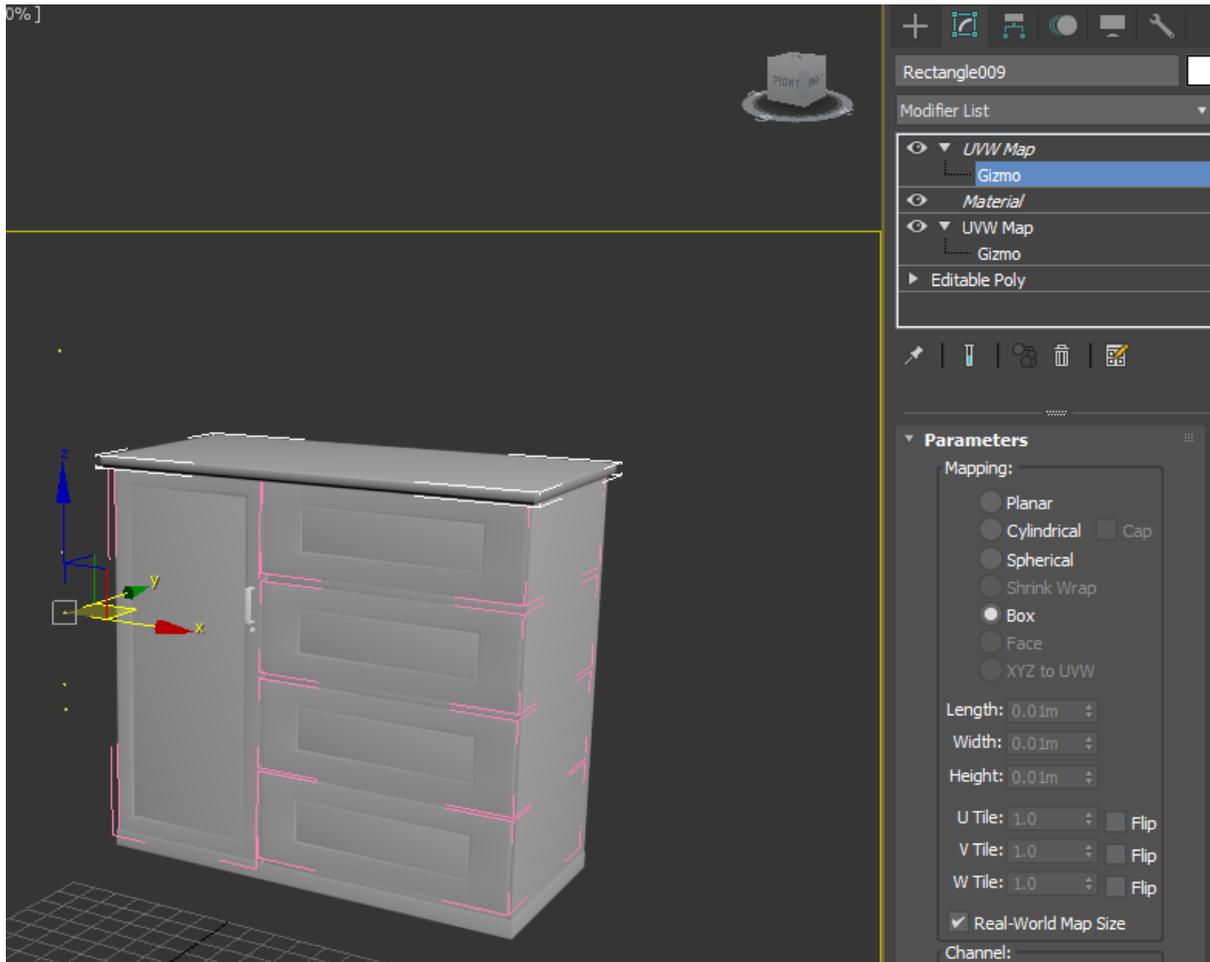


Fig 4.2.3: Wear drop Unwrap

### 4.2.4: Sink Tap:

For the sink tap we need go to the modifier> UV Unwrap > open UV editor> cut this clicking the middle edge then > unfold it.

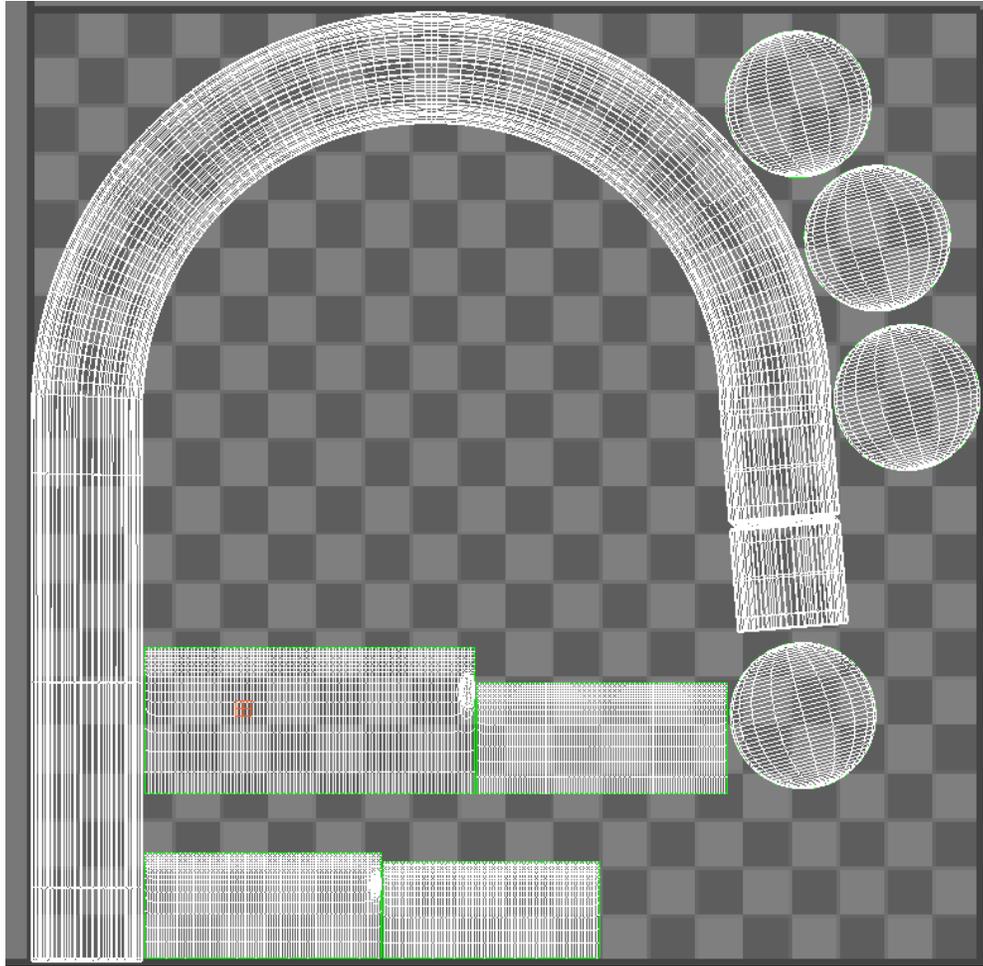


Fig 4.2.4: Sink Tap Unwrap

### **4.3: Texture:**

Texturing is a method of making high-quality detail, surface texture, or color info on a computer-generated 3d model or graphic. For our project, we've used "Autodesk Max" to texture most of our models. We are using PBR texture the objects. Physically-based rendering (PBR) is a shading method used to accurately represent the interaction of light with surfaces.

PBR is used by many real-time engines to describe a set of simplified shading models wholly driven by a small set of texture maps. While these shading models are already supported by the Physical Material, PBR contains many other unsupported features. For this reason, these simplified scripted materials have been created, with a front-end UI provided for the Physical Material <sup>[3]</sup>. Which is provided by the company.

#### **4.3.1: Bookshelf:**

For the bookshelf texturing we are using pbr based material. At first collect a script for this and then to the Autodesk max panel> run script> load textures.

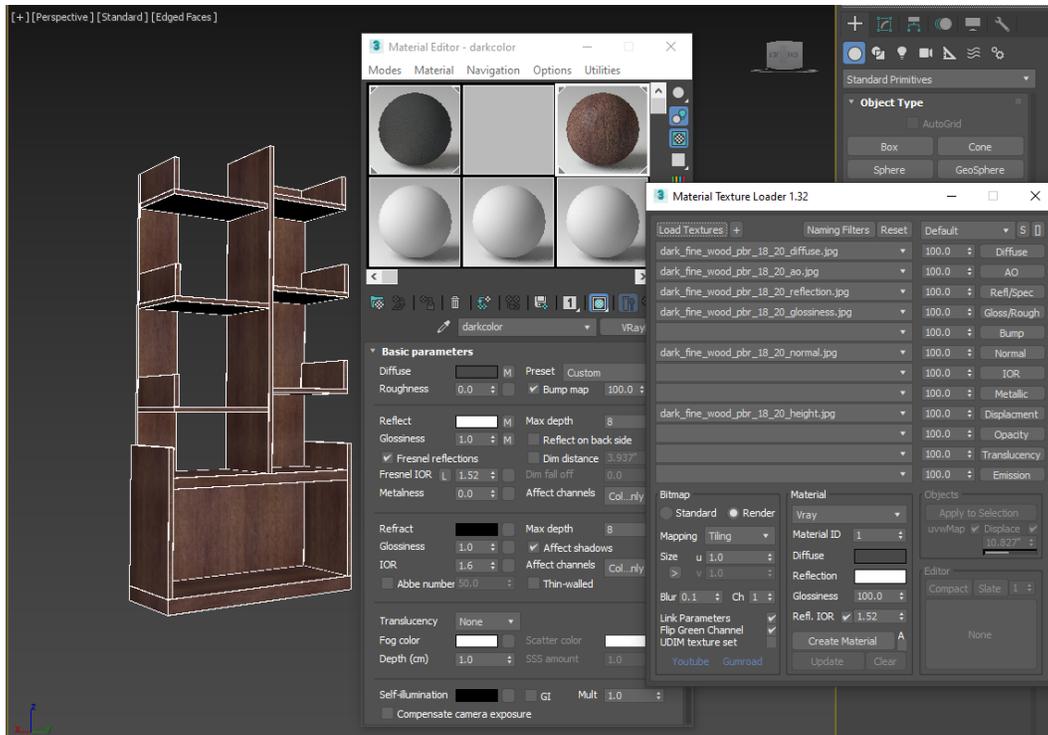


Fig 4.3.1: Bookshelf Texture in Autodesk Max

As this are box shape objects and after that we are using UVW map and changes the parameter to make the texture seamless and looks the product elegant.

### 4.3.2: Wear Drop:

This is also the same as the bookshelf. One thing is noted that when we are applying the texture though the script so we need to run the script all the time and then load the textures from the folder. We can also choose what we use in the object like normal map, glossiness, height map etc.

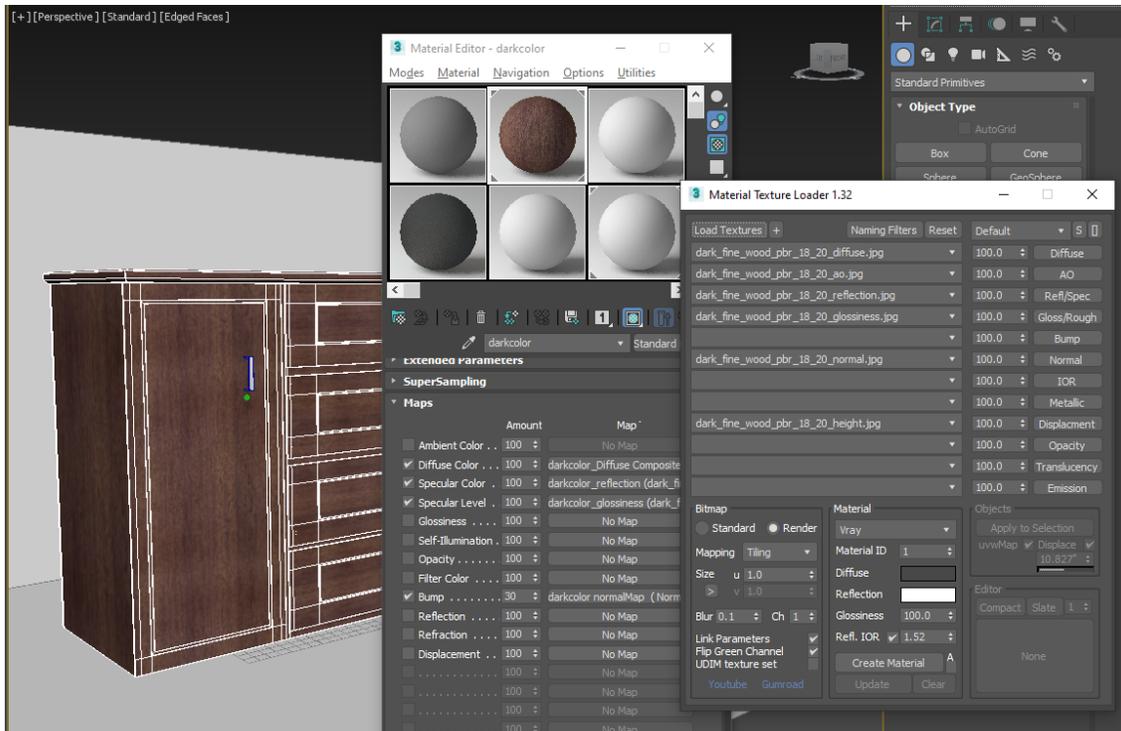


Fig 4.3.2: Wear drop Texture in Autodesk Max

Though we are adding the texture but we can also change the roughness glossiness manually from the material editor.

### 4.3.3: Book Texture:

For the book texture I am using the same method as before using for the others object.

Take the book and press Alt+Q for selected the upper part and hide the middle part of this book and apply the texture from the load texture. Then clicking the mouse right side and unhide all and apply the other material on the middle portion.

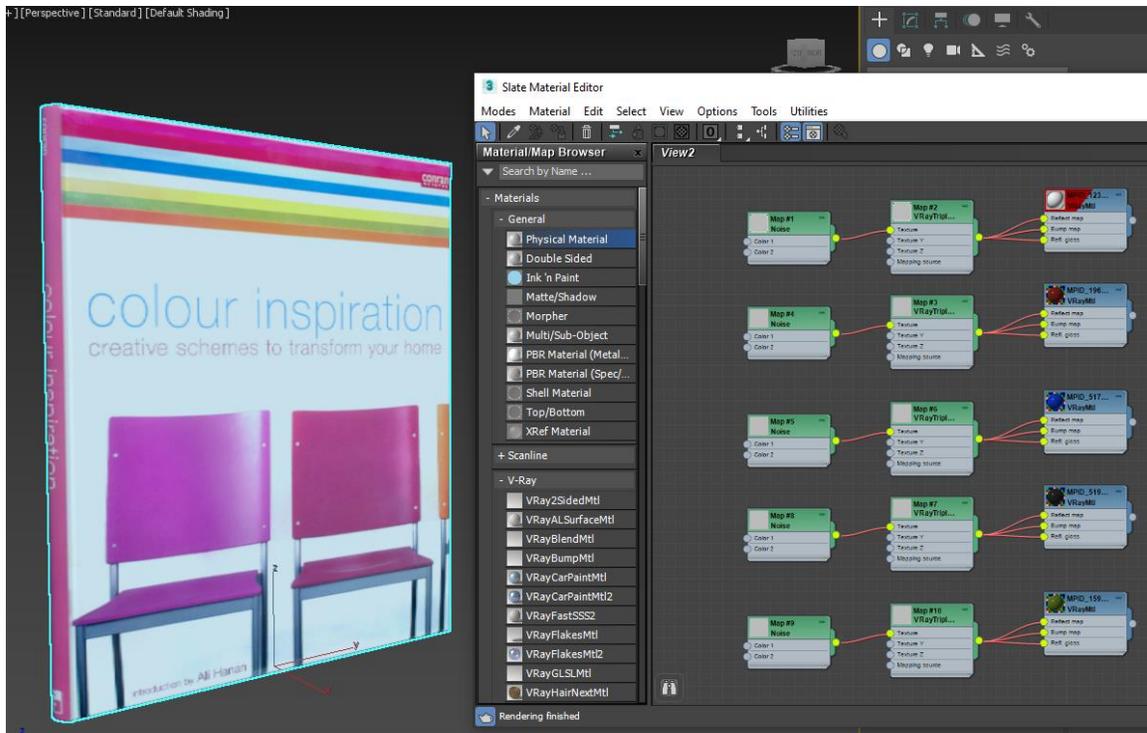


Fig 4.3.3: Book Cover Texture in Autodesk Max

As I can customize the material through the material slot so I am changing some roughness glossiness manually. Increasing the glossiness for the upper part of the book cover.

#### 4.4: Animation:

Animation is when images of figures are manipulated to appear to the human eye as though they're moving. In traditional animation, images are drawn independently to be photographed or put onto film. Another kind of traditional animation is called stop motion animation. With this, three-dimensional figures are painstakingly committed to film, frame by frame, being moved slightly between shots. With 3D animation, all of the images are created using computer graphics [11].

We used the keyframe animation technique to animate our product of various scenes. Key frames have been smooth with the help of the curve editor. Also, we animated scenes from different Angeles in seductive ways through the camera animating. We use a dummy character for the camera animation. So that it helps us in the texturing mode. We set up the lighting scene the same for the furniture visualization product and the product visualization.

#### 4.4.1: Wear Drop Animation:

For animating the wear drop we used a dummy as the support system then link the dummy to the camera. For this camera animation, we were using vray physical camera then animated the scene individually. And when we started animating the scene we used the safe frame mode by pressing shift+F. Basically, the Video Safe Frames feature displays a series of concentric rectangular frames in the viewport. Use these frames to see the proportions of your rendered output within the viewport. This is particularly useful when you're rendering to output that does not match the viewport's aspect proportion.

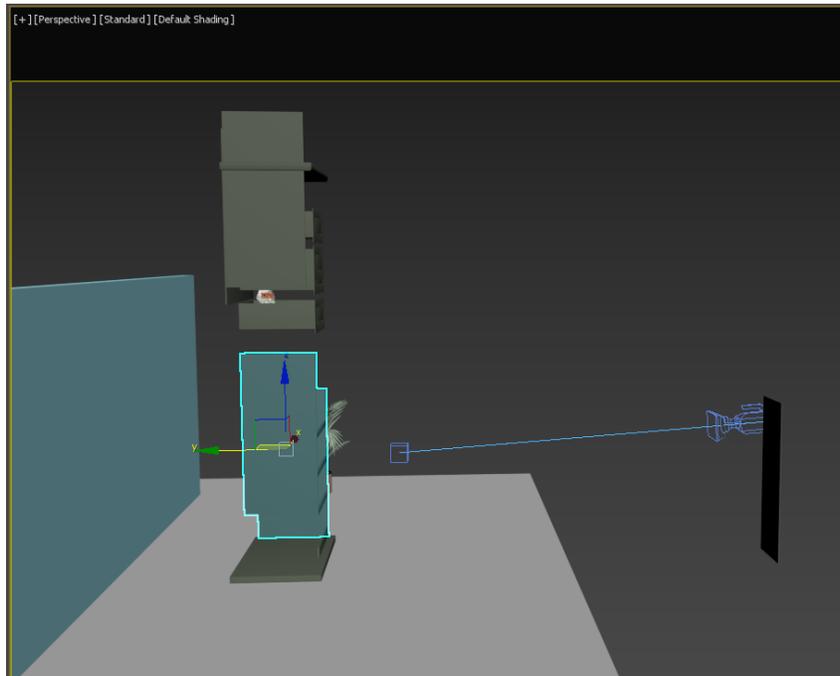


Fig 4.4.1: Wear Drop Animation in Autodesk Max



Fig 4.4.2: Wear Drop Animation in Autodesk Max Front View

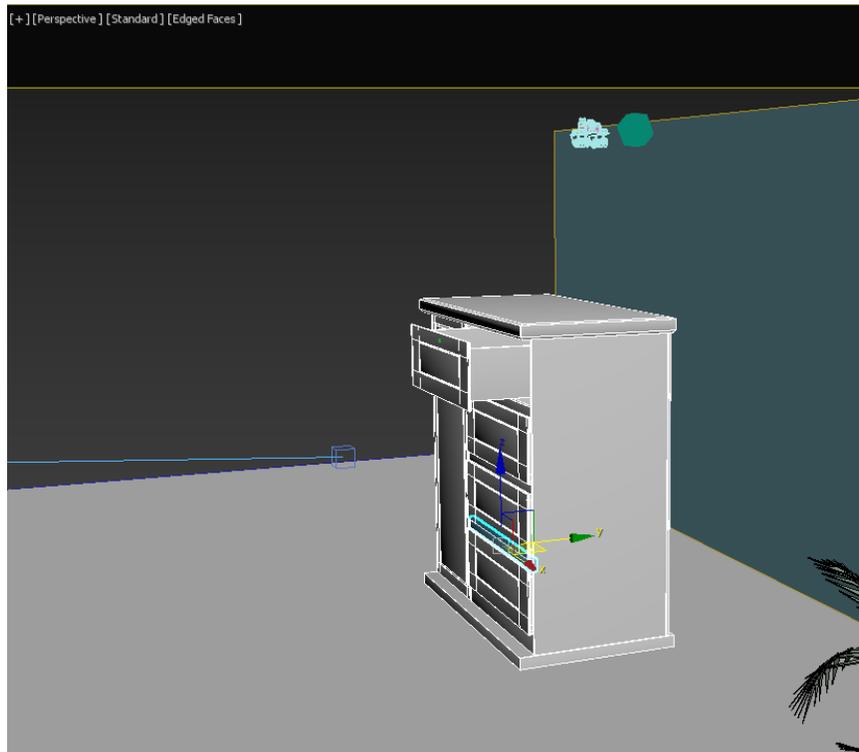


Fig 4.4.3: Wear Drop Animation in Autodesk Max Side view

The figure 4.4.1- 4.4.3 contains the animating part. Where we using the physical camera for animation the scene. Camera was slightly paned and the part of the wear drop was animated by the key. We take 0-350 frames for this animation.

#### 4.4.2: Book shelf Animation:

For the book shelf animation, we take the physical camera where the camera was still and animated the book shelf part separately. For this go to moodier panel> take the physical camera > from vray cameras. Setting the keys as needed. We set up the keys at 0-250 frames. And set the set frame mode for this animation.

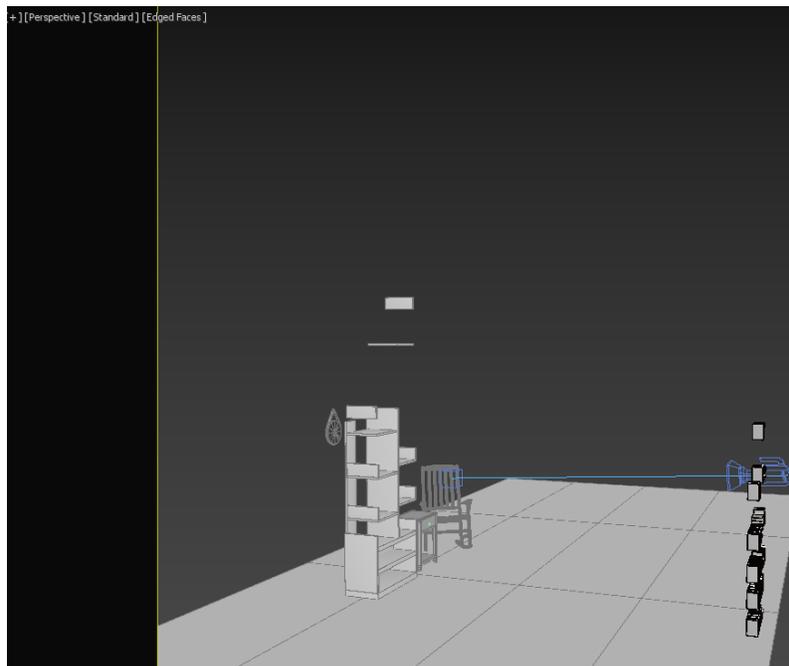


Fig 4.4.4: Book shelf Animation in Autodesk Max Side view

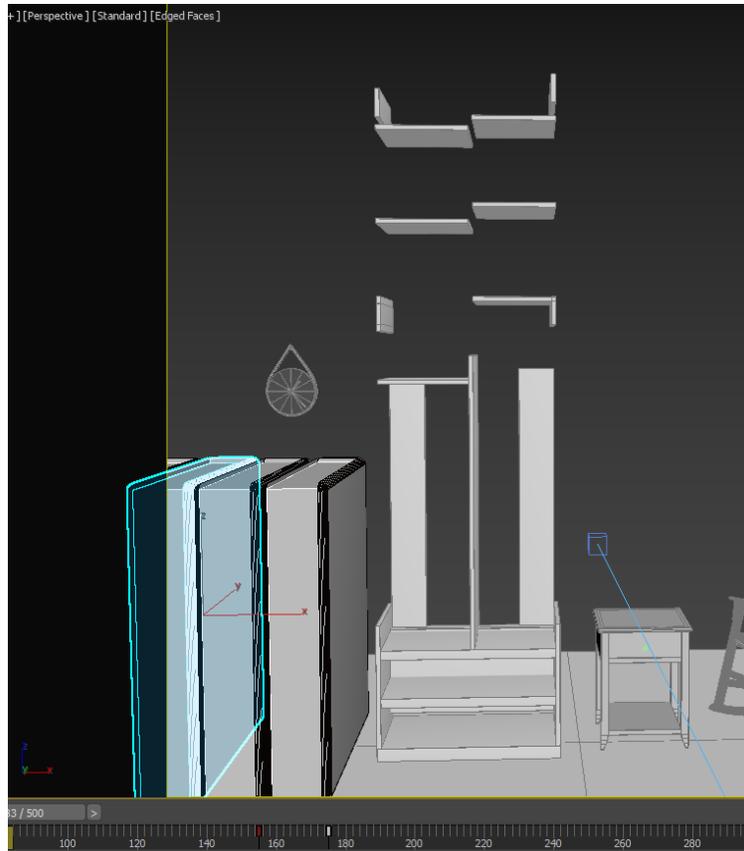


Fig 4.4.5: Book shelf Animation in Autodesk Max Side view

Figure 4.4.4- 4.4.5 contains the animating scene. Where we use the physical camera for animation the scene. Take a part individually and set the first key 0-20 then the second part was animated 15-25 and the rest of the objects doing in the same method.

#### 4.4.3: Divan Animation:

For the divan animation, we take the physical camera where the camera was still and animated the divan part independently. For this go to moodier panel> take the physical camera> from vray cameras. Setting the keys as demanded. And set the set frame mode for this animation. The camera was barely paned and the part of the wear drop was animated by the key. We take 0-350 frames for this animation.

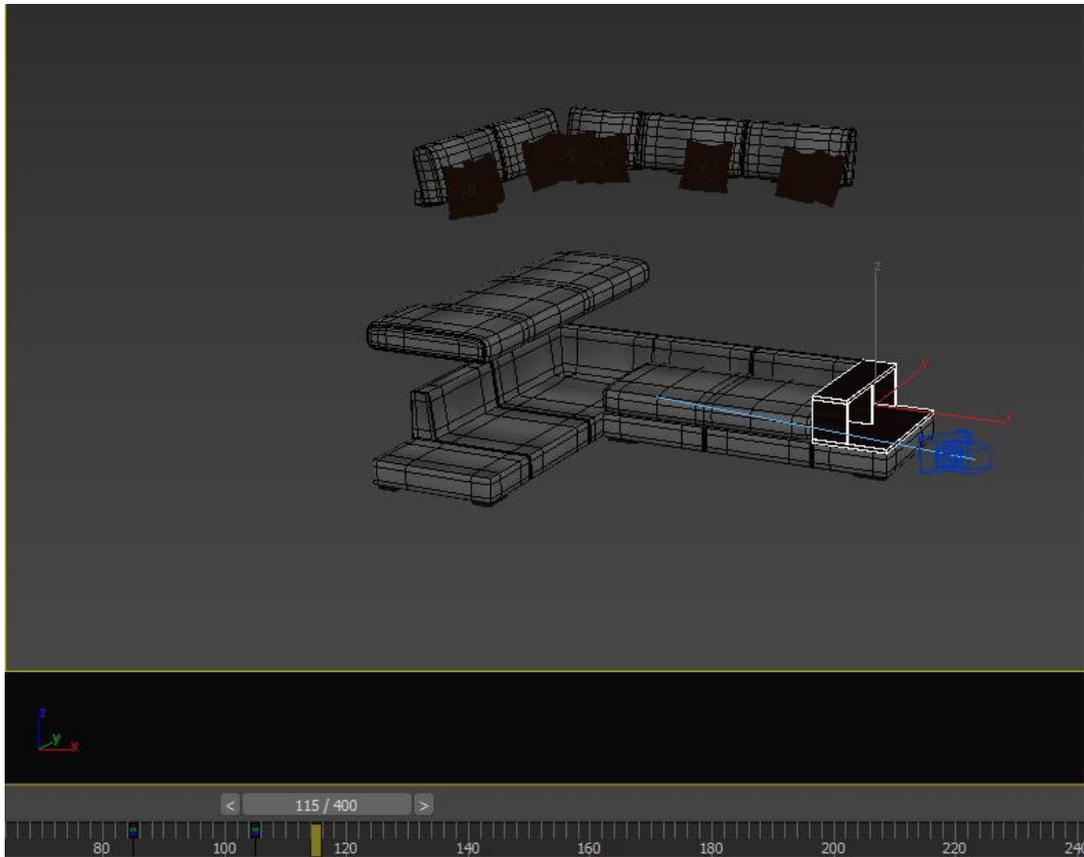


Fig 4.4.6: Divan Animation in Autodesk Max

Figure 4.4.6 was shows how we set the key frame for per objects and animated the scene.

#### 4.4.4: Study Desk Animation:

For animating the study desk, we used a dummy as the support system also link the dummy to the camera. For this camera vitality, we were using vray physical camera also amped the scene collectively. And when we started animating the scene we used the safe frame mode by pressing shift + F. substantially, the Video Safe Frames point displays a series of concentric square frames in the viewport. Use these frames to see the proportions of your rendered affair within the viewport. This is particularly useful when you are rendering to output that doesn't match the viewport's aspect proportion.

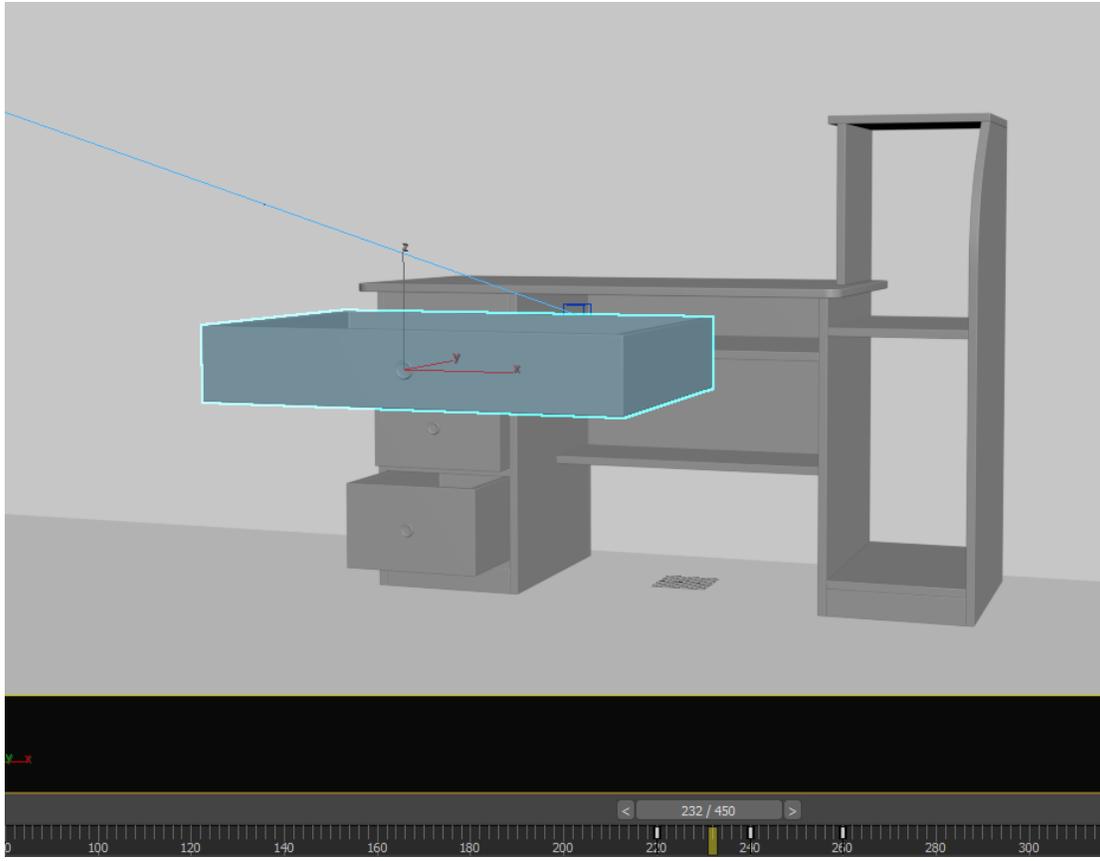


Fig 4.4.7: Study Desk Animation in Autodesk Max

Figure 4.4.7 contains the animating part. Where we use the physical camera for animation the scene. The camera was narrowly moved up to down and the part of the study desk was animated by the key manually. We take 0-300 frames for this animation.

## CHAPTER 5

### LIMITATIONS AND CHALLENGES

#### 5.1 Limitations:

Every mistake is an opportunity to learn something new. Materializing an idea isn't as easy as planning. Giving form to my idea wasn't much easy. There I had to face several problems, confusion and error in my design. Some problems happen due to my mistake and ignorance in the workflow. Though every problem killed my time and

energy I come suitable to break and avoid them coming time. In this chapter challenges, I had faced and the results will be discussed. A lot of impalpable limitations were faced while working on this design. These limitations affected the affair of our design in one way or another. Some of these are discussed below. The most impalpable limitation was the lack of experience. There were some gests in all the way in this process but the proper channel was no way followed. Also, the compass of skill perpetration was also limited. When it came to such a big design with a proper channel was to be followed, we fell suddenly on the experience which affected time operation and chancing results to problems faced.

A 3D vitality is a form of art that combines a lot of other forms of art. For initiating a design like this a lot of effects from the cultural angle need to be considered. Similar to the color palette

of the film, the aesthetics of the models, camera angle, camera movement, a sense of composition, etc.

#### 5.2 Challenges:

As this is a group project it was important that all the members work together with close propinquity so that whenever any member faces a problem they can reach out to other members.

This makes problem- solving much easier and carrying blessing faster. As of now, we've a big issue that's the Corona virus time so we did our work in the home as a home office. Living in different homes at first there were no fixed spots where we could work together.

All the software used for 3D vitality and picture requires high configuration computers. In this case the higher the configuration the better the quality. But for our average quality computers, we faced a lot of challenges to work with. Personally, me who has no graphics  
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card so I cannot run the render work. Lots of times my PC got crash for the poly count. The software kept crashing or getting wedged. Occasionally they came slow and couldn't read the commands and execute them properly. These kinds of problems wasted a lot of time which would not have been an issue if there were better quality computers available. Computers with advanced configurations can drop render time exponentially.

Render time is a big factor when it comes to producing any computer graphics. Keeping computer limitations in mind sufficient time places demanded to be allocated for the picture member. In order to produce the asked labors, a many new software and commands from known software were demanded to be learned in a veritably short time. As the knowledge of this software was limited so problem- solving came a big issue.

When I was imported some object with mirror effect that doesn't show in Lumion. Light set and the camera movement are different from the other 3D softer like Autodesk max and Autodesk maya etc.

Also, they have a shortage of time so we need to minimize the quality of some work and give the output in the given time schedules. For the large work, we need a lot of patience and time management because the animation needs a lot of time to render a frame. Per frame needs 2-3 minutes some are more than needed which is very annoying for us.

## CHAPTER 6

### CONCLUSION

This task has given us the possibility to take a look at a few new software program programs, greater widely the software program programs we already know. Challenge Workflow, modeling techniques, and UV unwrapping texturing are defined with inside the Challenge document. In this challenge, we found a brand-new method with UV.

As a financial factor, this picture helps to get the buyer`s interest via way of means of displaying the right characteristics of the product with inside the shortest possible time. An organization or producer can convey it to the marketplace with a much shorter length of spin-off visualization at a mile decrease cost. 3D visualization work offers producers sufficient room to innovate and gift to consumers in the space. Instead of searching out engagement via banner commercials and movies on mobile devices, from the marketing and marketing era, the organization has used 3D commercials to permit producers to have interacted with and interact with their audience. It may be tough to create good general product animations that draw colors, brainstorm, and draw the visitor's interest to the whole ad.

The is the most important general and precis shape up to now for developing consumers with miles better go back on investment. The concept of 3D product modeling for commercials is virtually modern in our country, however, developing superb 3D commercials isn't a smooth task. With 3D commercials, consumers can experience locating products more than still images. Our intention is to offer an entire 3D visualization of hard surface modeling such as product modeling, furniture modeling, and different architectural artwork on tough floors. As the client requires we did our work with a high quality within a short time. As they are satisfied we are glad to work with them and also with the Aava 3D Institute.

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