

**A MACHINE LEARNING APPROACH TO FIND STUDENTS' SATISFACTION FROM  
HOME VS HOSTEL IN BANGLADESH**

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of  
Science in Computer Science and Engineering.

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## APPROVAL

This Project/internship titled “**A Machine Learning Approach to Find Students’ Satisfaction from Home VS Hostel in Bangladesh**”, submitted by **Jarin Nooder**, ID No: 171-15-9553 and **Ashrarfi Mahbuba**, ID No: 171-15-9203 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **28 January 2021**.

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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Ms. Nazmun Nessa Moon, Assistant Professor, Department of CSE** and co-supervision of **Warda Ruheen Bristi, Lecturer, Department of CSE**, Daffodil International University. We 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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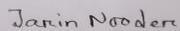
**Co-Supervised by:**



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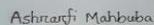
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Finally, we must acknowledge with due respect the constant support and patients of our parents.

## ABSTRACT

Students are the backbone of a nation. We have to offer them the best requirements they need for their study. Among all these needs, the most important one is where they can get the perfect atmosphere as per their requirements. Our research title “**MACHINE LEARNING APPROACH TO FIND STUDENTS’ SATISFACTION FROM HOME VS HOSTEL IN BANGLADESH**” focuses on finding out the best place to study among the students living with their parents and those in hostels. This study also concentrates on factors like the living environment with learning resources and facilities of students. 400 students' responses were measured through adapted questionnaires from different schools, colleges, universities, and recently graduated students. The results of the analysis reveal that students prefer a home as it is safe and comfortable for living and study. We have used many algorithm techniques but we preferred the Logistics Regression Algorithm the most for this research as we have got the best accuracy rate in this. So we can say that students prefer home mostly.

## TABLE OF CONTENTS

<b>CONTENTS</b>	<b>PAGE</b>
Approval	i
Declaration	ii
Acknowledgement	iii
Abstract	iv
List of Figures	viii
List of Tables	ix
<b>CHAPTER</b>	
<b>CHAPTER 1: INTRODUCTION</b>	1-3
1.1 Introduction	1
1.2 Motivation	2
1.3 Objectives	2
1.4 Research Questions	2
1.5 Expected Outcome	3
1.6 Report Layout	3
<b>CHAPTER 2: BACKGROUND</b>	4-6
2.1 Introduction	4
2.2 Related Survey	4
2.3 Scope of The Problem	5
2.4 Challenges	6
<b>CHAPTER 3: RESEARCH METHODOLOGY</b>	7-11
3.1 Introduction	7
3.2 Research Subject And Instrumentation	7

3.3 Data Collection Procedure	7
3.4 Machine Learning Algorithms	10
3.5 Statistical Analysis	10
3.6 Implementation Requirements	11
<b>CHAPTER 4: EXPERIMENTAL RESULTS AND DISCUSSION</b>	12-32
4.1 Introduction	12
4.2 Experimental Setup	12
4.3 Experimental Results And Analysis	12
4.3.1 Effect of Result	13
4.3.1.1 Age of Respondents	16
4.3.1.2 Sex Response	17
4.3.1.3 Educational Level of Respondents	18
4.3.1.4 Living Residence	19
4.3.1.5 In Where Respondents Prefer to Stay	20
4.3.1.6 Why Respondents Prefer to Stay at Home	21
4.3.1.7 Why Respondents Prefer to Stay at Hostel	22
4.3.1.8 Regular Study Hour	23
4.3.1.9 Regular Internet Accessing Hour	24
4.3.1.10 Regular Sleeping Period	25
4.3.1.11 Where Respondents Get Better Result	26
4.3.1.12 How Was The Last Passed Exam of Respondents	27
4.3.1.13 Are The Respondents Satisfied with Their Result	28
4.3.1.14 Mental Health of The Respondents	28
4.3.1.15 Do The Respondents Have Drug Addiction	30
4.3.1.16 Have The Respondents Grown Up Any Bad Habit Like Gambling or Something Else	31
4.4 Summary	32

<b>CHAPTER 5: SUMMARY, CONCLUSION, RECOMMENDATION, IMPLICATION FOR FURTHER STUDY</b>	33-34
5.1 Summary of The Study	33
5.2 Conclusion	33
5.3 Recommendation	33
5.4 Implication for Further Study	34
<b>REFERENCES</b>	35
<b>APPENDIX</b>	36-40

## LIST OF FIGURES

<b>FIGURES</b>	<b>PAGE NO</b>
Figure 3.1: Methodology at a glance	8
Figure 3.2: ARFF file of Dataset	9
Figure 3.3: Numeric dataset	10
Figure 3.4: Statistical analysis of the experimental dataset	11
Figure 4.1: Heat map of all datasets	14
Figure 4.2: Confusion Matrix	15
Figure 4.3: Age of respondents	16
Figure 4.4: Sex of respondents	17
Figure 4.5: Educational level of respondents	18
Figure 4.6: Living residence of respondents	19
Figure 4.7: In where respondents prefer to stay	20
Figure 4.8: Why respondents prefer to stay at home	21
Figure 4.9: Why respondents prefer to stay at hostel	22
Figure 4.10: Regular study hour	23
Figure 4.11: Regular internet accessing hour	24
Figure 4.12: Regular sleeping period of respondents	25
Figure 4.13: Where respondents get better result	26
Figure 4.14: How was the last passed exam of respondents	27
Figure 4.15: Are the respondents satisfied with their result	28
Figure 4.16: How is the mental health of the respondents	29
Figure 4.17: Do the respondents have drug addiction	30
Figure 4.18: Have the respondents grown up any bad habit like gambling or something else	31

## LIST OF TABLES

<b>TABLES</b>	<b>PAGE NO.</b>
Table 4.1: Accuracy Table	13
Table 4.2: Age of Respondents	16
Table 4.3: Sex of respondents	17
Table 4.4: Educational level of respondents	18
Table 4.5: Living residence of respondents	19
Table 4.6: In where respondents prefer to stay	20
Table 4.7: Why respondents prefer to stay at home	21
Table 4.8: Why respondents prefer to stay at hostel	22
Table 4.9: Regular study hour	23
Table 4.10: Regular internet accessing hour	24
Table 4.11: Regular sleeping period of respondents	25
Table 4.12: Where respondents get better result	26
Table 4.13: How was the last passed exam of respondents	27
Table 4.14: Are the respondents satisfied with their result	28
Table 4.15: How is the mental health of the respondents	29
Table 4.16: Do the respondents have drug addiction	30
Table 4.17: Have the respondents grown up any bad habit like gambling or something else	31

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Globalization and digital innovation have devised a claim for new and various restraints in education. New institutions have been established and engagement of students is also surging. In child development, education should start with birth, and last till the time of death. Education helps individuals to learn new skills and information. Education's main goal is to acquire tasks, knowledge, facts, and traits by encouraging the individuals which were not obtained previously. Due to advanced technology and proliferation, simply and instantly students can get information. In the education field, technology is incorporated as a part of the modules, as a didactic delivery scheme, as a means of subsidizing disciplines, and also as an apparatus to intensify the entire literature proceeding. Learning is a hike in insight. Learning is retaining, amassing cases or conducts that are to adopt, manufacture impression, and recognize the phenomenon.

Home is a point where pupils stay along with their origins or guardians, grow up, and inaugurate to pick up the norms and values of the culture in which they notice themselves. Individuals make a considerable emotional investment and spend the greater part of their lives at home which is the space-group-time entity. The environment of a home means a student's family background which includes the parent's education level, occupation, socioeconomic status, and availability of socializing facilities in the house. Even though the surrounding also plays a very significant appearance in the life and academic prosperity of every mortal vitality. A cooperative family environment instills certainty in children.

To pursue formal education, the place students stay away from their homes is the hostel. The hostel is a human practical laboratory that is not only barred in the residence. That's why the hostel is a center of education, not simply a place for living. During hostel stay, students learn exceptionally from roommates. Students in the hostel pick up the theoretical material to intensify their capabilities and to last independently. The hostel mostly consists of an abundance of students. Those students move from distinct virtuous, communal, geographical, and fiscal practices.

The continuation of education is the main reason to stay in a hostel. When students come to the hostel, adjustment with the hostel environment and roommates is the first problem they have to face. In the starting days, students miss their home and family badly and sometimes become emotional after communicating with parents on cell phones. At that time, roommates and hostel buddies supported the hostel. For a specific period, living away from family, students gain some surviving experiences in life. Students pick up to live independently and pick up the ways of compromise with the other students and roommates, in this new lifestyle.

## **1.2 Motivation**

As we all know, the education rate is expanding constantly. Students are more likely to get a better education. Some students are studying with their family and some are continuing living in the hostel. So we decided to find out the preferable place to study for students.

## **1.3 Objectives**

Our main objective of the research is

- To find the place of study which is best for students.
- To create a predictive model for helping to find the place between home and hostel.
- To know the environment students prefer for their study.

## **1.4 Research Questions**

1. Does it predict an actual output by given sample data with your system?
2. Can it classify study of student's satisfaction from home and hostel using a machine learning algorithm?
3. Does every algorithm work perfectly (yes/no)?
4. Do we know the satisfaction percentage of male and female?

We have trained our machine with a large number of data set and got a good accuracy and we are also much sure that our machine can easily predict accurate result based he/she is satisfied on his/her study from home or hostel.

We have used 4 algorithms such Random Forest Classifier, Linear Regression, Logistics Regression and Decision Table Rule algorithms and we have obtained a good result but other algorithm didn't gave us good accuracy and feedback.

## **1.5 Expected Outcome**

Expected outcome of this study is to predict a place where students feel safe, have enough privacy and have a comfortable study environment.

## **1.6 Report Layout**

The draft of the report is incorporated as follow:

In **chapter 1**, provides a brief introduction to the research. The inference for electing this project, how will this project be completed, project motivation, expected outcome, and so on are deliberated briefly. Shortly, chapter 1 is an explanation of this project's introduction.

In **chapter 2**, related works on this area that were analyzed are presented. Their findings and limitations are reviewed and onward the scope and challenges of the research are also listed.

In **chapter 3**, the methodology of this research will explain the Subject and Instrumentation, Procedure of Data Collection, Analysis of Statistics, and Implementation Obligations.

In **chapter 4**, preliminary consequences and experimental results discussion and pictorial study.

In **chapter 5**, performs a short conclusion and the list of references.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

To inspect experimental questions within educational exploration the interest of using data mining has been increasing in recent decades. In this chapter, we will discuss data mining related to research or thesis about data classifiers. Previous related work will be discussed in the first section, in the second section the scope of the problems of our study related work will be shown and lastly, we will discuss the challenges we faced in this study.

#### **2.2 Related Survey**

H. Liaqat et al. [1] focused on finding out whether students' residential conditions affect the psychological state of mind through data mining. They operated with 211 students from 3 different medical institutions in Pakistan. Among them, staying with family were 122 (57.81%) and hostel living were 89 (42.18%). They used the DASS-42 scale to develop questionnaires and SPSS 20.0.1 to calculate depression, anxiety, and stress levels.

B. Z. Butt et al. [2] worked with 350 students from different levels and institutions to examine student's higher education satisfaction by focusing on the expertise of teachers, offered courses, classroom facilities, and learning environment. Six sections were compromised for the questionnaire. They adapted a questionnaire to measure a student's response on a 5-point Likert scale. SPSS was used to analyze, regression and Independent Sample and T-Test were performed to measure the male and female student's satisfaction differences.

A Iftekher et al. [3] grounded a theory on five males and five females on different university hostel student's behavior and personality between twenty to twenty-five age ranges. They select those ten students to get better information about their experience of hostel life. Hostel life is a combination of multicultural social groups where mostly male students are affected negatively due to drug use.

A.O. E. Egunsola [4] surveyed the senior secondary students' academic performance on the influence of the home environment. A total of 900 students' data was collected using a multi-stage random sampling technique. The objective of the study was covered with 40 questionnaire items. A four-point scale was used and three experts of the Agricultural education field validated the instrument. To analyze and interpret the data they used inferential statistics z-test and correlation analysis. Students' academic performances were mostly correlated with parental educational qualification (73%), occupation (71%), home location (73%), and economic status (60%).

F. Khozaei et al. [5] administered to identify students' satisfaction levels of living in the campus hostel and living outside the campus hostel. Due to the different characteristics of these two groups of hostel residents, there would be a variation in the satisfaction zone. A total of 288 female and male student's data was collected. 48.3% were living in the campus hostel and 51.7% were from outside the campus hostel. They used SPSS version 17.0 for data analysis and extraction method for factor analysis and the factor analysis indicates Eigenvalues of six factors which is greater than 0.5. They found significant differences among the inside-campus and outside-campus hostel students.

### **2.3 Scope of the Problems**

The field delineates the region of the research, that is, the extent to which we will observe the subject. In most investigations, for different purposes, it is inconceivable to expect to focus on each part of the point. Something more, the study will take a notably lengthy time span, if not unto the end of time! Therefore, you need to designate or restrict the region you will consider. For instance, in your case, you may prefer a gender for a specific reason for students' study satisfaction. For example, safety, privacy, or a suitable place to study, and not certain others, for example, living environment, mental health. Also, you may decide to contemplate certain gatherings, regardless of whether as far as result, or satisfaction of result, and not certain others.

## 2.4 Challenges

The challenges we faced:

- **Data collection:** One of the major difficulties of this research paper was data collecting. Because of COVID'19, we decided to collect data online. When we started data collecting from the students of schools, colleges, universities, and graduates, most of them expressed doubts that their information could be leaked. We could collect more than a thousand student survey results through survey questionnaires afterward.
- **Model Selection:** One of the hardest parts of research is model selection. Data set and model selection is the key to the success of any research. Choosing the model correctly provides a positive outcome. For selecting the model, after testing some models, we come to the point that linear regression, logistics regression are suitable for this work. As Google provides a free virtual GPU, we could work with Google CoLab. For our use, we finalized those algorithms.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the procedure of this survey and makes out many strategies that describe which one (study in-home or hostel) is preferred by students. The analysis will encompass the draft of the research, Research Subject, and Instrumentation, Data Collection Procedure, Statistical Analysis. Apparatus for the research project, data collection, research topic, pre-processing, processing, and its exertion will be discussed in this discussion. As for fixing real-life data mining obstacles, we will use WEKA for data processing, implementation, and so on.

#### **3.2 Research Subject and Instrumentation**

For any research paper, the main part is collecting data. Information is a very fundamental piece of research. It is very hard to find out the perfect needed data and algorithm for a research project. We have to study more papers related to our work. Then we come to some conclusions just like these:

1. Which data will be needed?
2. How to ensure that the collected data are ok?
3. How can we organize the data for our project?
4. How can we label each data?

#### **3.3 Data Collection Procedure**

For our project, we have surveyed some questions in which we included age, gender, study institution, result, the satisfaction of result, sleeping period, study period, etc.

The following figure 3.1 shows what procedures we have used in methodology.



Figure 3.1: Methodology at a glance

Here are the procedures we have followed:

### 1. Data pre-processing

It is the pre-phase of processing datasets. Generally, we collect raw data for the understanding of general people and then we process the data for our implementation. This is one of the most important parts of research. In this phase, we collected 400 data and sort the data in a Google spreadsheet. Then we converted the dataset to a numeric value. Then we have converted the CSV file into an ARFF file in WEKA for getting the accuracy of different classifiers.

The following figure 3.2 shows the converted ARFF file in WEKA.

No	1: Age	2: Gender	3: Institution	4: Place	5: Whyhome	6: Whyhostel	7: studyhour	8: internet	9: sleep	10: betterresult	11: lastexam	12: satisfiedresult	13: mental	14: drug	15: gambling	16: Prefer
	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric
1	23.0	1.0	2.0	5.0	1.0	5.0	2.0	5.0	8.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0
2	21.0	0.0	2.0	3.0	1.0	3.0	10.0	10.0	4.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0
3	23.0	0.0	2.0	5.0	3.0	5.0	2.0	7.0	6.0	1.0	1.0	1.0	2.0	2.0	2.0	1.0
4	22.0	1.0	3.0	5.0	1.0	5.0	1.0	10.0	6.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0
5	22.0	1.0	2.0	1.0	2.0	1.0	2.0	5.0	8.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0
6	22.0	0.0	3.0	5.0	1.0	5.0	5.0	10.0	3.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0
7	22.0	0.0	3.0	3.0	2.0	5.0	1.0	4.0	9.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0
8	22.0	1.0	2.0	5.0	1.0	5.0	2.0	6.0	6.0	1.0	1.0	1.0	2.0	2.0	2.0	1.0
9	23.0	1.0	2.0	5.0	3.0	5.0	3.0	10.0	10.0	1.0	3.0	1.0	1.0	2.0	2.0	1.0
10	23.0	0.0	2.0	4.0	2.0	5.0	4.0	2.0	6.0	1.0	3.0	2.0	1.0	2.0	2.0	1.0
11	24.0	0.0	3.0	3.0	1.0	5.0	1.0	10.0	7.0	2.0	3.0	2.0	2.0	2.0	2.0	1.0
12	21.0	0.0	2.0	4.0	1.0	5.0	4.0	5.0	7.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0
13	21.0	0.0	2.0	4.0	1.0	5.0	4.0	5.0	7.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0
14	21.0	0.0	2.0	4.0	1.0	5.0	4.0	5.0	7.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0
15	23.0	1.0	2.0	3.0	1.0	5.0	1.0	10.0	7.0	1.0	2.0	1.0	2.0	2.0	2.0	1.0
16	19.0	0.0	2.0	3.0	2.0	1.0	2.0	4.0	8.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0
17	21.0	0.0	2.0	5.0	1.0	5.0	3.0	6.0	8.0	1.0	1.0	1.0	2.0	2.0	2.0	1.0
18	23.0	0.0	2.0	5.0	2.0	5.0	1.0	10.0	6.0	1.0	3.0	1.0	2.0	2.0	2.0	1.0
19	21.0	0.0	2.0	3.0	4.0	5.0	4.0	6.0	5.0	1.0	3.0	2.0	1.0	2.0	2.0	1.0
20	21.0	0.0	2.0	3.0	3.0	1.0	3.0	7.0	6.0	1.0	2.0	2.0	3.0	2.0	2.0	1.0
21	22.0	0.0	3.0	5.0	3.0	5.0	2.0	7.0	8.0	1.0	2.0	1.0	2.0	2.0	2.0	1.0
22	24.0	0.0	3.0	3.0	5.0	1.0	3.0	10.0	5.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0
23	21.0	1.0	2.0	5.0	2.0	5.0	4.0	6.0	8.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0
24	22.0	0.0	3.0	3.0	1.0	5.0	6.0	3.0	7.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0
25	21.0	0.0	2.0	3.0	1.0	5.0	2.0	10.0	6.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0
26	24.0	0.0	2.0	3.0	5.0	2.0	1.0	10.0	8.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0
27	23.0	0.0	3.0	3.0	1.0	5.0	1.0	7.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	1.0
28	24.0	0.0	3.0	3.0	3.0	5.0	2.0	10.0	8.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0
29	22.0	0.0	3.0	3.0	1.0	5.0	4.0	4.0	8.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0
30	19.0	0.0	2.0	5.0	1.0	1.0	4.0	3.0	5.0	1.0	3.0	2.0	2.0	2.0	2.0	1.0
31	20.0	1.0	2.0	5.0	3.0	5.0	2.0	4.0	8.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0
32	24.0	0.0	2.0	5.0	1.0	5.0	1.0	3.0	7.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0
33	23.0	0.0	3.0	5.0	1.0	3.0	4.0	5.0	6.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0
34	23.0	1.0	2.0	5.0	3.0	5.0	1.0	10.0	9.0	1.0	3.0	2.0	2.0	2.0	2.0	1.0
35	18.0	1.0	1.0	5.0	1.0	5.0	2.0	10.0	7.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0
36	22.0	1.0	2.0	1.0	3.0	1.0	3.0	6.0	7.0	2.0	2.0	2.0	3.0	2.0	2.0	1.0
37	18.0	0.0	1.0	5.0	1.0	5.0	4.0	4.0	6.0	1.0	3.0	2.0	1.0	2.0	2.0	1.0
38	20.0	1.0	2.0	5.0	3.0	5.0	1.0	3.0	7.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0

Figure 3.2: ARFF file of dataset

## 2. Data Organizing

For organizing the data, we have stored it in a Microsoft Excel file. We have tested and trained the data and saved them in two folders. Besides, we have also used validation folder to check train data validation. Then we have created sub-folders in the test and train.

## 3. Labeling Data

In this part, we will convert our string data sets into numeric values for our perfection of the result as the computer cannot understand the string values properly and cannot give the accuracy.

Here some of our labeled data after pre-processing:

In the following figure 3.3 shows the numeric datasets after labelling.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Age	Gender	Institution	Place	Whyhome	Whyhoste	studyhour	internet	sleep	betterresi	lastexam	satisfiedr	mental	drug	gambling	Prefer
2	23	1	2	5	1	5	2	5	8	1	2	1	1	2	2	1
3	21	0	2	3	1	3	10	10	4	1	1	1	1	2	2	1
4	23	0	2	5	3	5	2	7	6	1	1	1	2	2	2	1
5	22	1	3	5	1	5	1	10	6	1	1	1	1	2	2	1
6	22	1	2	1	2	1	2	5	8	1	2	1	3	2	2	1
7	22	0	3	5	1	5	5	10	3	1	2	1	3	2	2	1
8	22	0	3	3	2	5	1	4	9	1	2	1	2	1	2	1
9	22	1	2	5	1	5	2	6	6	1	1	1	2	2	2	1
10	23	1	2	5	3	5	3	10	10	1	3	1	1	2	2	1
11	23	0	2	4	2	5	4	2	6	1	3	2	1	2	2	1
12	24	0	3	3	1	5	1	10	7	2	3	2	2	2	2	1
13	21	0	2	4	1	5	4	5	7	1	2	2	1	2	2	1
14	21	0	2	4	1	5	4	5	7	1	2	2	1	2	2	1
15	21	0	2	4	1	5	4	5	7	1	2	2	1	2	2	1
16	23	1	2	3	1	5	1	10	7	1	2	1	2	2	2	1
17	19	0	2	3	2	1	2	4	8	2	2	1	1	2	2	1
18	21	0	2	5	1	5	3	6	8	1	1	1	2	2	2	1
19	23	0	2	5	2	5	1	10	6	1	3	1	2	2	2	1
20	21	0	2	3	4	5	4	6	5	1	3	2	1	2	2	1
21	21	0	2	3	3	1	3	7	6	1	2	2	3	2	2	1
22	22	0	3	5	3	5	2	7	8	1	2	1	2	2	2	1
23	24	0	3	3	5	1	3	10	5	2	2	1	1	2	2	2
24	21	1	2	5	2	5	4	6	8	1	2	1	1	2	2	1
25	22	0	3	3	1	5	6	3	7	1	2	2	1	2	2	1
26	21	0	2	3	1	5	2	10	6	1	2	1	1	2	2	1
27	24	0	2	3	5	2	1	10	8	2	3	2	2	2	2	2
28	23	0	3	3	1	5	1	7	2	1	2	1	2	2	2	1

Figure 3.3: Numeric Dataset

#### 4. Data Storing

We have stored data in Google drive as Google sheets so that they may not be lost. We have also stored all the data as a CSV file. Later, we can use them for our coding and analyzing models. The following figure 3.4 shows the methodology to take a look.

### 3.4 Machine Learning Algorithms

To know the accuracy rate we have applied Random Forest Classifier, Linear Regression, and Logistics Regression and Decision Table Rule algorithms on the training data set to build a model. All the applied algorithms on python and libraries are NumPy, Pandas, Scikit-learn and Matplotlib.

### 3.5 Statistical Analysis

Figure 3.3 represents the statistical analysis of the containing attributes in our dataset which has been built with 400 individual data.

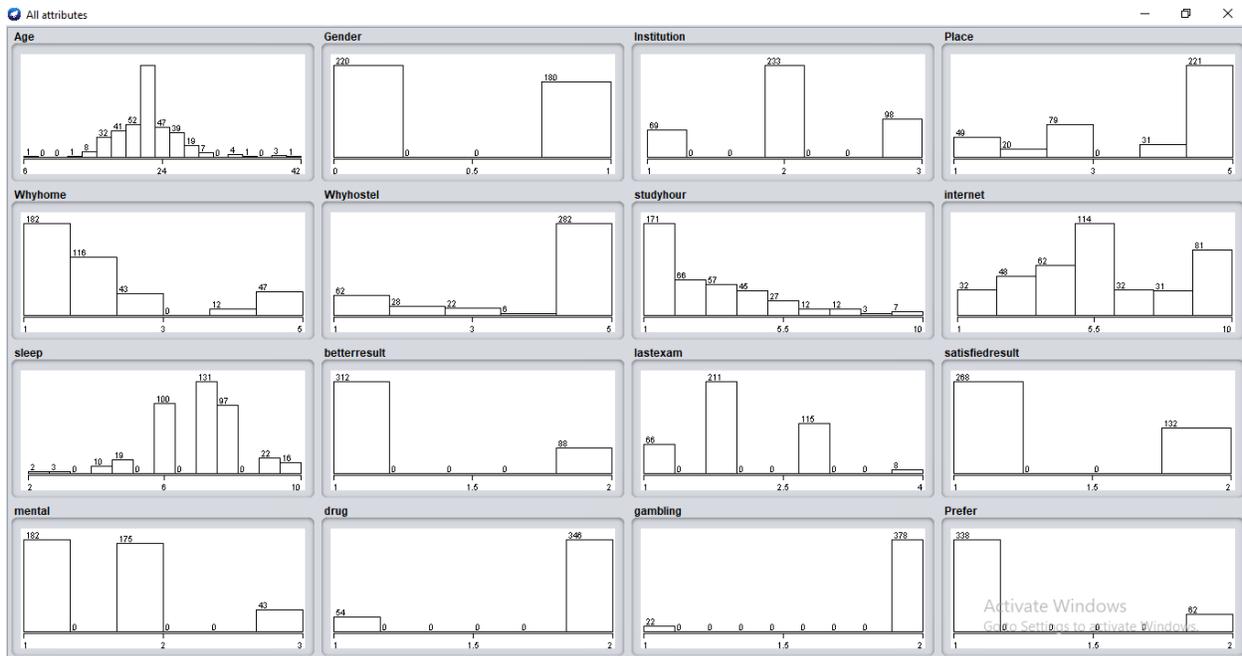


Figure 3.4: Statistical Analysis of the Experimental dataset

### 3.6 Implementation Requirements

- Python 3.8

Here we have used this version of Python that is Python 3.8. Python is a high level programming language, but it is very easy to understand and implement. So we have chosen Python. We use pandas, NumPy, Scikit-learn library of Python for implementation.

- Google CoLab

Google CoLab is an open source distributor of Python programming that is free. In here, we have imported the libraries that we needed for implementation and got our result.

- Hardware/ Software requirements:

1. Operating system(Windows 10)
2. Web browser (Preferably chrome)
3. Hard Disk (Minimum 4 GB)
4. Ram ( More than 4 GB)

# CHAPTER 4

## EXPERIMENTAL RESULT AND DISCUSSION

### 4.1 Introduction

In this chapter, we will cover the presentation of data analysis and illustration of survey results. Presentation and illustration of the data are presented in frequency and percentages.

### 4.2 Experimental Setup

For the implementation of our model and code, we have collected data first. We have used the procedures that are given below:

- As we have worked for the prediction of a suitable place for students in their student life and betterment for their future, we had to collect data from every level of the student.
- The largest part of the allotted time for the research project was spent on collecting data from students of the school, college, and university by taking surveys.
- We have collected data online by using Google Form.
- Then we have labeled the data and made them perfect for further use.
- After that, we have converted the string data into a numerical type.
- At last, we have processed the data and started our code using models.
- Then finally, we have found out the accuracy of our research.

### 4.3 Experimental Results and Analysis

We have run our dataset to create a model from the given data. It provided us with the desired output. We have collaborated on all the data sets with each other. Then, we have compared the results of the people who prefer home or hostel most. We have also compared where the students get better results in-home or hostel. Here we have presented tables and graphs for our analysis of data. We have processed analysis with 400 respondents.

We have gotten a good accuracy; the highest accuracy rate is 0.95 which is in the Logistics Regression algorithm. We also have got 0.7893 accuracy by Linear Regression algorithm, 0.8664

accuracy by Random Forest Classifier algorithm and 0.8695 accuracy by Decision Table algorithm. In the following table 4.1 indicates all the accuracy of these algorithms.

Table 4.1: Accuracy Table

<b>Algorithm Name</b>	<b>Accuracy</b>
Logistics Regression	95%
Linear Regression	78.93%
Random Forest Classifier	86.64%
Decision Table	86.95%

### **4.3.1 Effect of result**

We have collaborated with all the data sets and got a relation among all of them. We have also got some accuracy of the result.

Here in the following figure 4.1 shows the collaboration of all data's as a heat map.

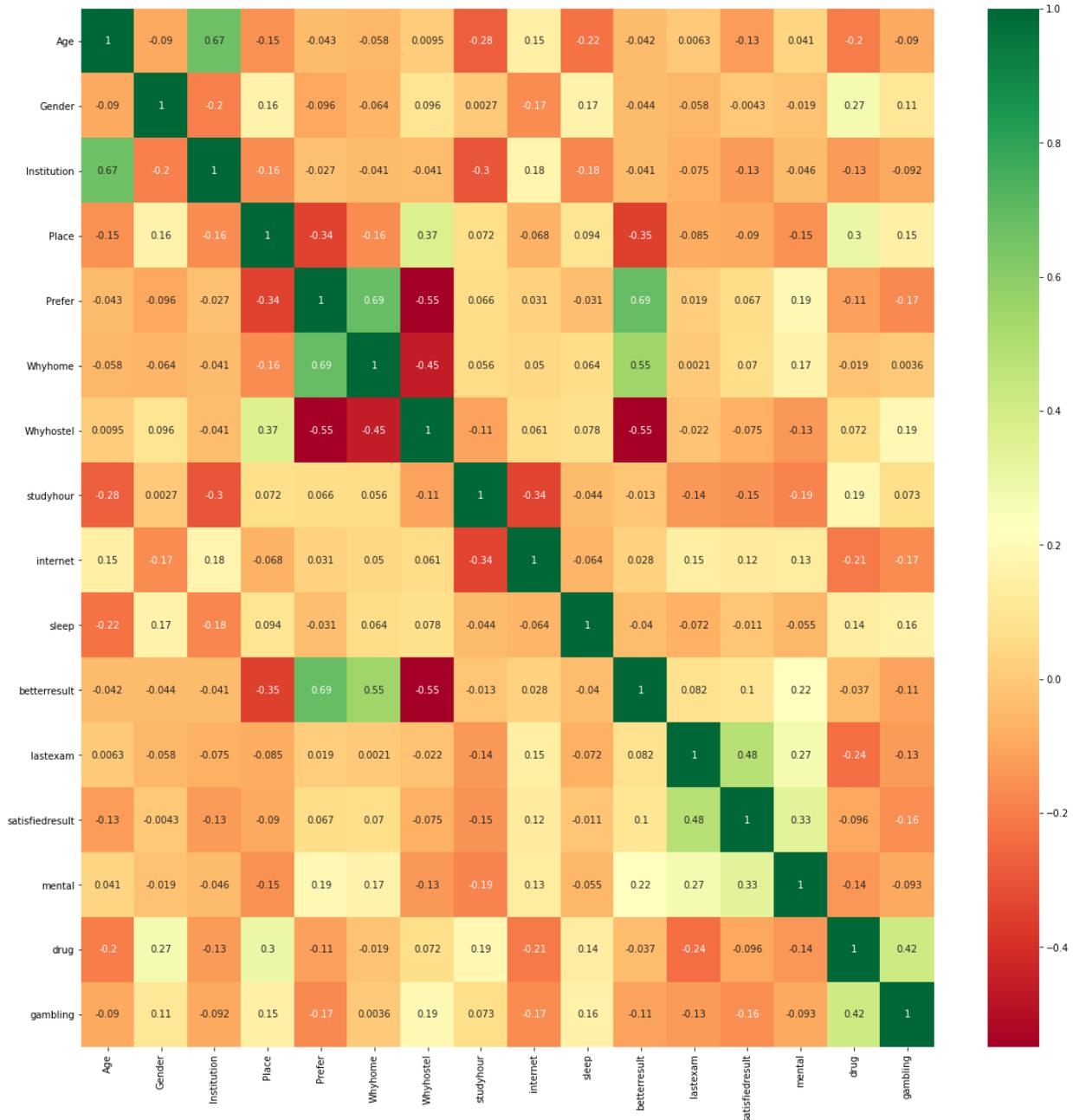


Figure 4.1: Heat map of the datasets

Here in the following figure 4.2 shows the confusion matrix that is used to measure the performance of the Logistics Regression algorithm as we have got the best accuracy rate in it and prefer to use it further.

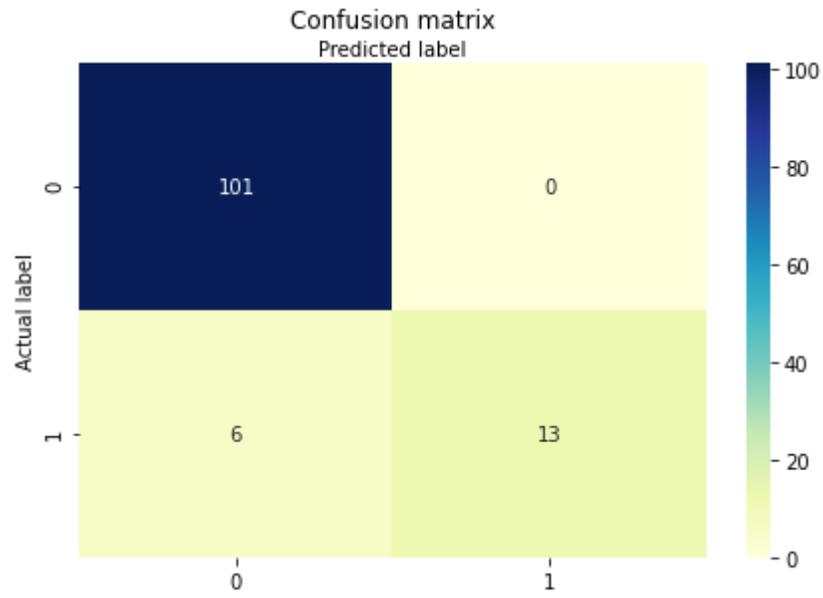


Figure 4.2: Confusion matrix

### 4.3.1.1 Age of Respondents

The following table 4.1 represents the age of the respondents of our dataset.

Table 4.1 Age of Respondents

	Frequency	Percent
Under 20	78	19.5
20-25	270	67.5
26-35	42	10.5
Above 35	10	2.5
Total	400	100.0

From the above table 4.1 we can see that, there are 78(19.5%) of the respondents are under 20, the next response are 270(67.5%) respondents, who are at the age in between 20 to 25, the next response are 42(10.5%) respondents, who are at the age in between 26-35 and the next response is 10(2.5%) respondents, who are at the age of above 35 years. The following figure 4.3 shows the graph of the table 4.1.

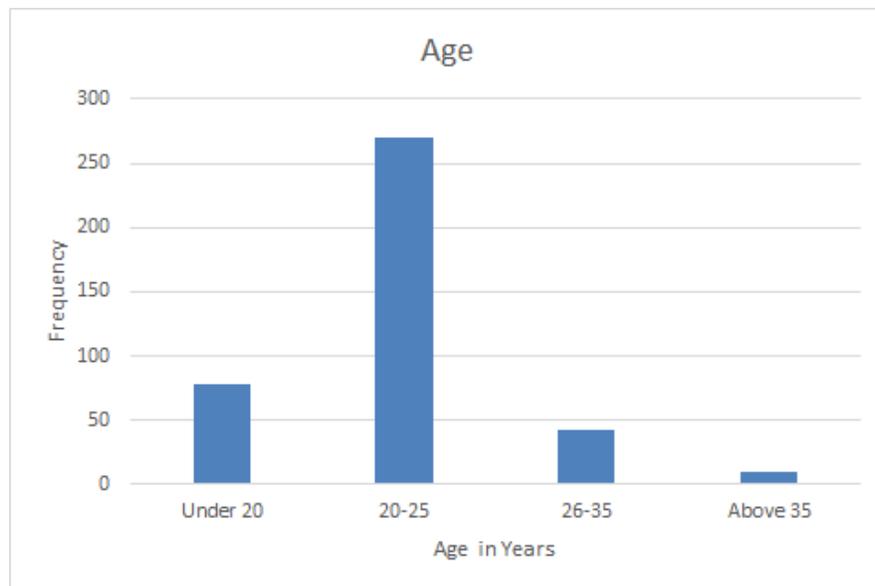


Figure 4.3 Age of respondents

### 4.3.1.2 Sex Response

The following table 4.2 shows the sex of the respondents from our dataset.

Table 4.2 Sex of Respondents

	Frequency	Percentage
Male	220	55
Female	180	45
Total	400	100.0

The above Table 4.2 shows that the sex distribution were 220 (55%) male and 180(45%) female.

The following figure 4.4 shows the graph of table 4.2.

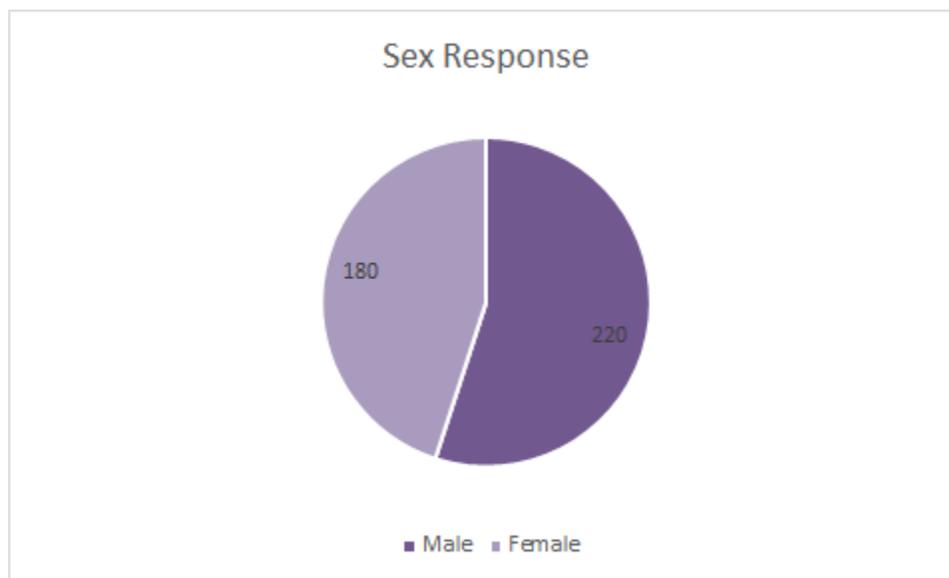


Figure 4.4: Sex of respondents

### 4.3.1.3 Educational Level of Respondents

The following table 4.3 shows the educational level of the respondents from our dataset.

Table 4.3: Educational Level of Respondents

Institution	Frequency	Percentage
School	68	17
College	99	24.75
University	233	58.25
Total	400	100.0

The above table 4.3 indicates that 68 (17%) respondents are in school, 99 (24.75%) respondents are in college and 233 (58.25%) respondents are in university. The majority is university students.

The following figure 4.5 shows the graph of table 4.3.

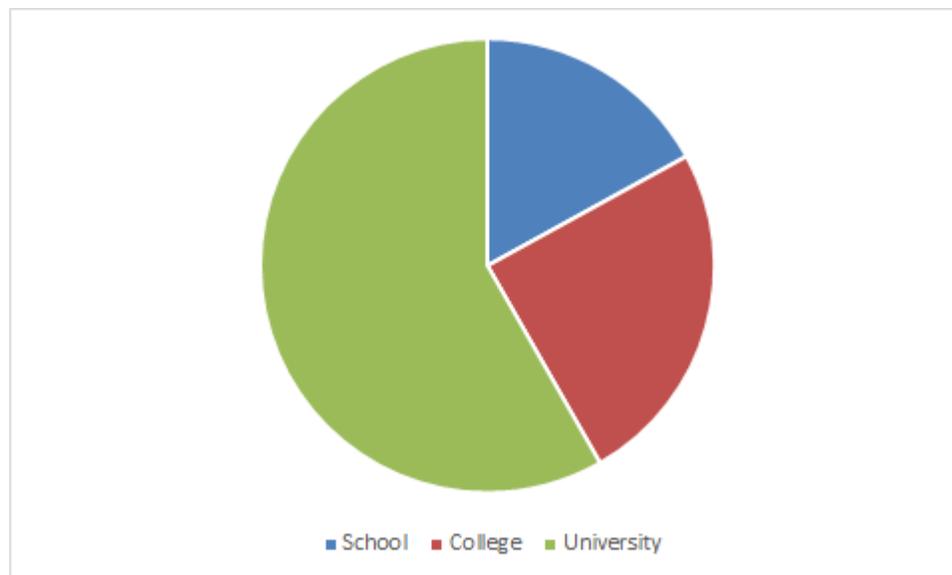


Figure 4.5: Educational level of respondents

### 4.3.1.4 Living Residence

The following table 4.4 indicates the living residence of the respondents from our dataset.

Table 4.4: Living Residence of Respondents

	Frequency	Percentage
With parents	221	55.25
Rent flat with friends	79	19.75
Campus hostel	49	12.25
At a relative's house	30	7.5
Outside hostel	21	5.25
Total	400	100.0

The above table 4.4 indicates that 221 (55.25%) respondents live with their parents, 79 (19.75%) respondents live with their friends by renting flat, 49 (12.25%) respondents live in campus hostel, 30 (7.5%) respondents live at a relative's house and 21 (5.25%) respondents live in outside hostel. The majority among respondents is living with parents. The following figure 4.6 shows the graph of table 4.4

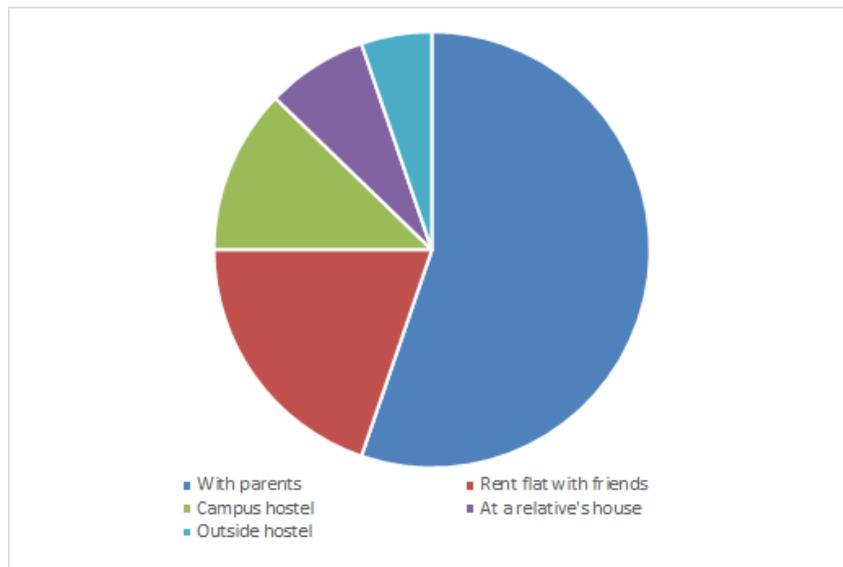


Figure 4.6: Living residence of respondents

### 4.3.1.5 In Where Respondents Prefer to Stay

The following table 4.5 shows where the respondents prefer to stay from our dataset.

Table 4.5: In where respondents prefer to stay

	Frequency	Percentage
Home	338	84.5
Hostel	62	15.5
Total	400	100.0

The above table 4.5 indicates that 338 (84.5%) respondents prefer to stay at home and 62 (15.5%) respondents prefer to stay at a hostel. The majority among respondents is living with parents. The following figure 4.7 shows the graph of table 4.5

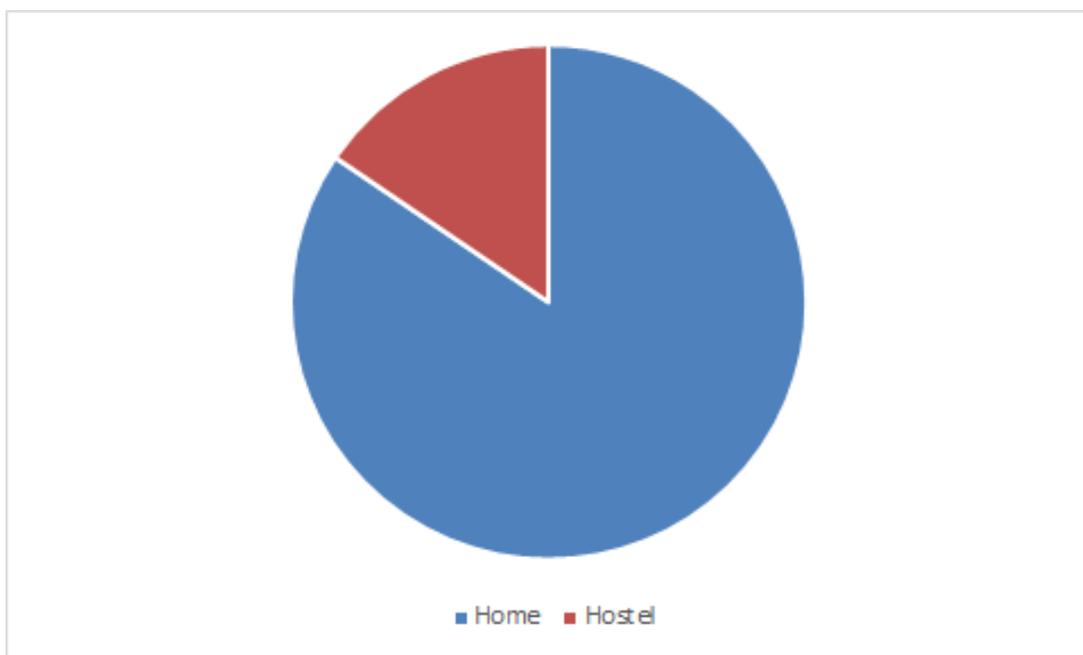


Figure 4.7: In where respondents prefer to stay

### 4.3.1.6 Why Respondents Prefer to Stay at Home

The following table 4.6 shows the reasons for what respondents prefer to stay at home from our dataset.

Table 4.6: Why respondents prefer to stay at home

Reasons	Frequency	Percentage
It is suitable for my study	182	45.5
I feel safe here	116	29
I have enough privacy in here	43	10.75
My parent/siblings help me in studying	12	3
I prefer hostel	47	11.75
Total	400	100.0

The above table 4.6 shows that 182 (45.5%) respondents prefer to stay at home because it is suitable for their study, 116 (29%) respondents prefer home because they feel safe at home, 43 (10.75%) prefer home because they have privacy in there, 12 (3%) respondents prefer home because their parents or siblings help them in studying and 47 (11.75%) respondents prefer to stay at a hostel. The following figure 4.8 shows the graph of table 4.6

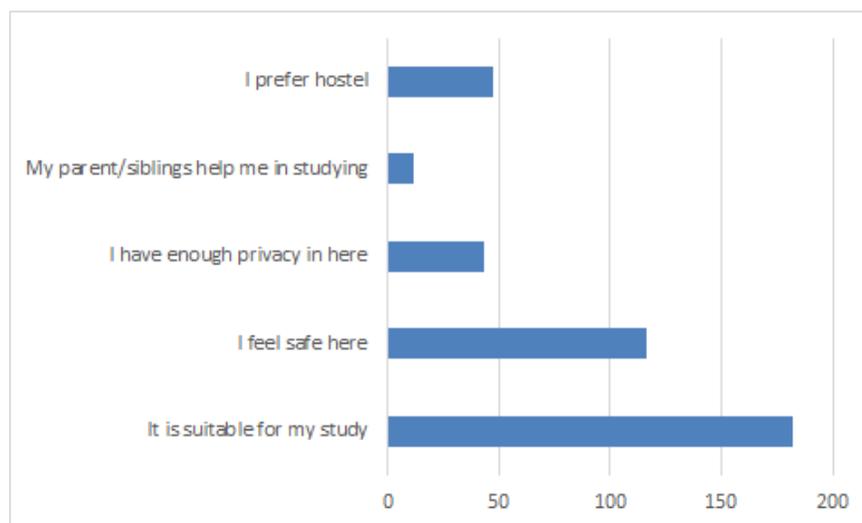


Figure 4.8: Why respondents prefer to stay at home

### 4.3.1.7 Why Respondents Prefer to Stay at Hostel

The following table 4.7 indicates the reasons for what respondents prefer to stay at hostel.

Table 4.7: Why respondents prefer to stay at hostel

Reasons	Frequency	Percentage
It is suitable for my study	62	15.5
I have enough privacy in here	28	7
I can do group study freely	22	5.5
I don't like the environment of my home	6	1.5
I prefer home	282	70.5
Total	400	100.0

The above table 4.7 shows that 62 (15.5%) respondents prefer to stay at hostel because it is suitable for their study, 28 (7%) respondents prefer hostel because they have enough privacy at hostel, 22 (5.5%) prefer hostel because they can do group study in there, 6 (1.5%) respondents prefer hostel because they don't like the environment of their home and 282 (70.5%) respondents prefer to stay at a home. The majority of respondents prefer to stay home. The following figure 4.9 shows the graph of table 4.7

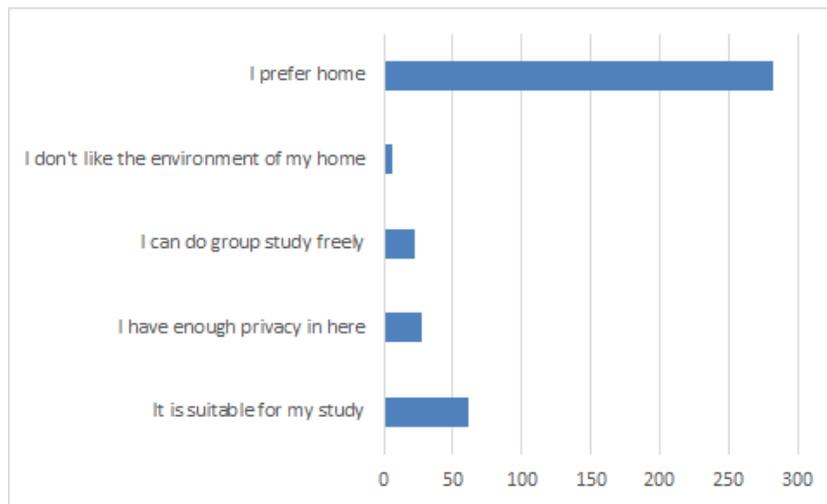


Figure 4.9: Why respondents prefer to stay at hostel

### 4.3.1.8 Regular Study Hour

The following table 4.8 shows the time period of the study of the respondents from our dataset.

Table 4.8: Regular study hour

Hours	Frequency	Percentage
1	70	17.5
2	102	25.5
3	66	16.5
4	57	14.25
5	45	11.25
6	27	6.75
7	12	3
8	12	3
9	3	0.75
10	6	1.5
Total	400	100.0

The result of the above table 4.8 is shown in figure 4.10 as graph.

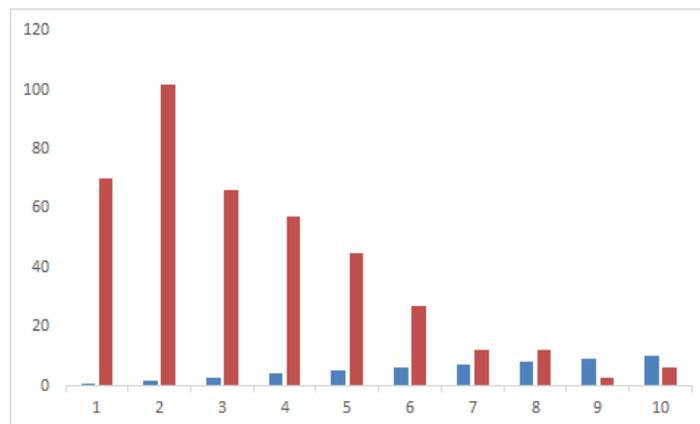


Figure 4.10: Regular study hour of respondents

### 4.3.1.9 Regular Internet Accessing Hour

The following table 4.9 shows the time period of regular internet accessing of the respondents.

Table 4.9: Regular internet accessing hour of respondents

Hours	Frequency	Percentage
1	11	2.75
2	20	5
3	48	12
4	62	15.5
5	60	15
6	55	13.75
7	32	8
8	31	7.75
9	31	7.75
10	50	12.5
Total	400	100.0

The result of the above table 4.9 is shown in figure 4.11 as graph.

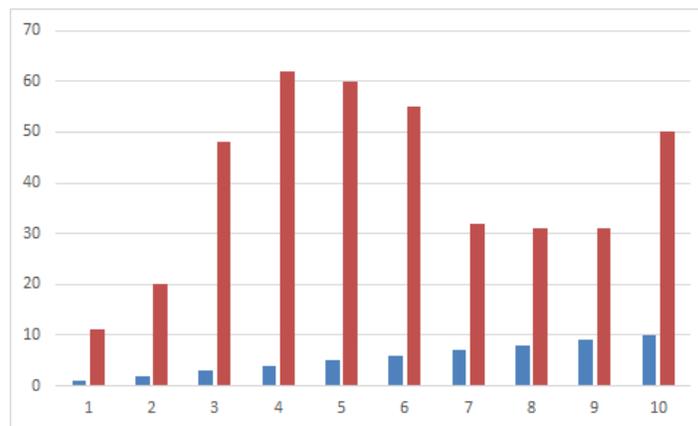


Figure 4.11: Regular internet accessing hour of respondents

### 4.3.1.10 Regular Sleeping period

The following table 4.10 shows the regular sleeping period of the respondents from our dataset.

Table 4.10: Regular sleeping period of respondents

Hours	Frequency	Percentage
1	0	0
2	2	0.5
3	3	0.75
4	10	2.5
5	19	4.75
6	101	25.25
7	131	32.75
8	96	24
9	22	5.5
10	16	4
Total	400	100.0

The result of the above table 4.10 is shown in figure 4.12 as graph.

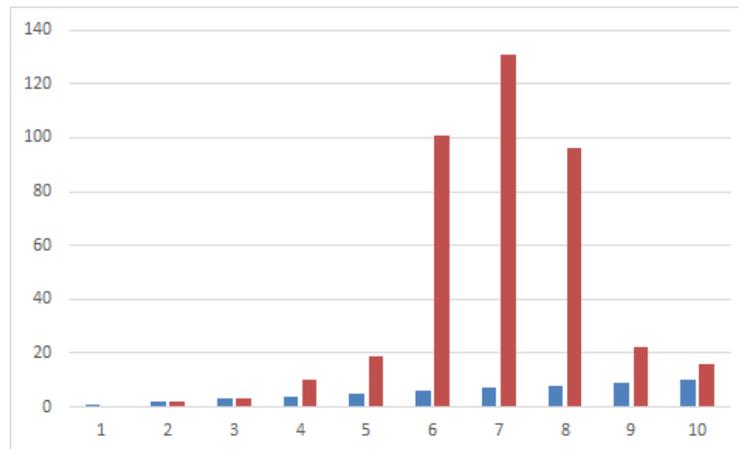


Figure 4.12: Regular sleeping period of respondents

### 4.3.1.11 Where Get Better Result

The following table 4.11 indicates at which place respondents get better result from our dataset.

Table 4.11: Where respondents get better result

	Frequency	Percentage
At home	312	78
At hostel	88	22
Total	400	100.0

The above table 4.11 shows that 312 (78%) respondents get better results at home and 88 (22%) respondents get better results at hostel. We can see that the majority of respondents get better results at home. The following figure 4.13 shows the graph of table 4.11

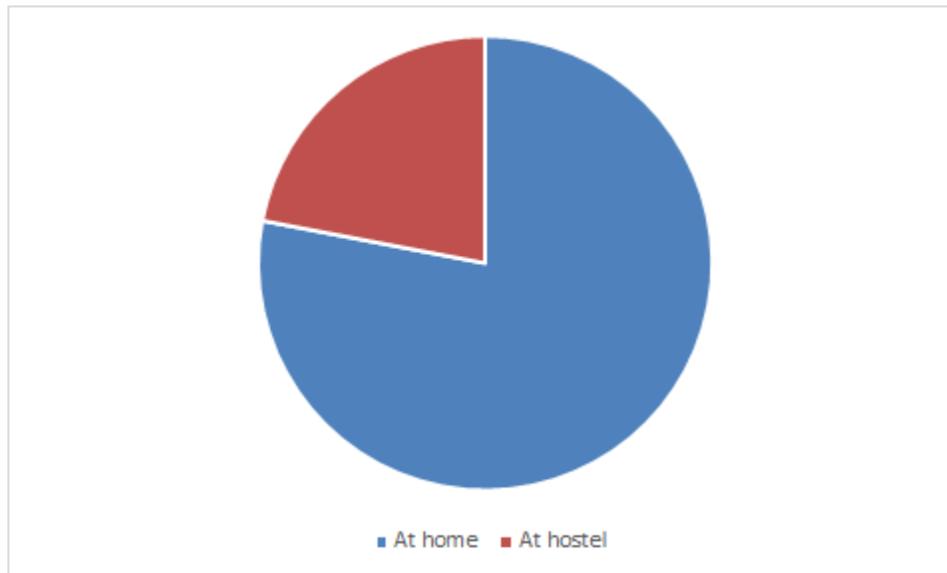


Figure 4.13: Where respondents get better result

### 4.3.1.12 How Was the Last Passed Exam of Respondents

The following table 4.12 shows how the last passed exam of the respondents from our dataset was.

Table 4.12: How was the last passed exam of respondents?

	Frequency	Percentage
Best	65	16.25
Good	212	53
Average	115	28.75
Below average	8	2
Total	400	100.0

The above table 4.12 shows that 65 (16.25%) respondents got the best result in their last passed exam, 212 (53%) respondents got the good result, 115 (28.75%) respondents got the average result and 8 (2%) respondents got the below average result in their last passed exam. The following figure 4.14 shows the graph of table 4.12

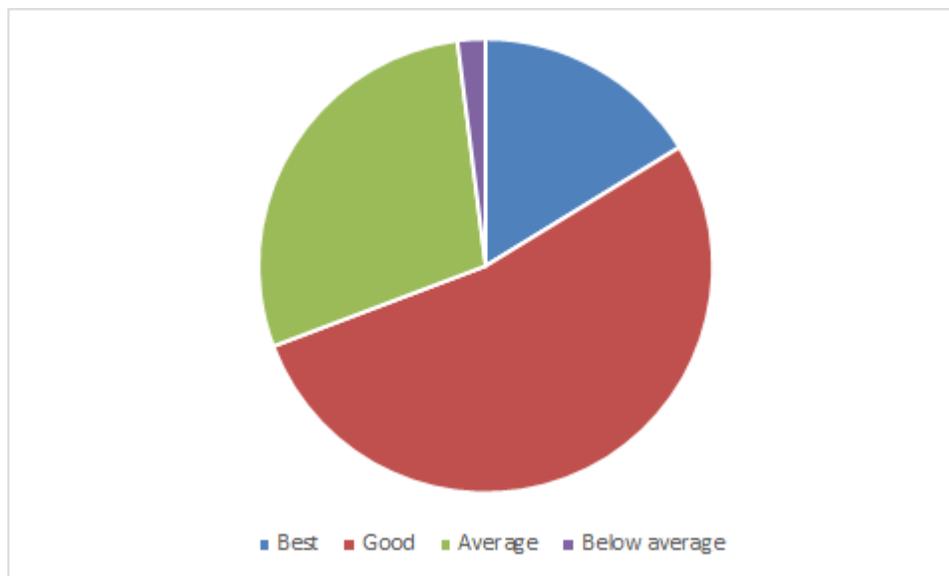


Figure 4.14: How was the last passed exam of respondents

### 4.3.1.13 Are the Respondents Satisfied with Their Result

The following table 4.13 shows if the respondents are satisfied with their result from our dataset.

Table 4.13: Are the respondents satisfied with their result

	Frequency	Percentage
Yes	265	66.25
No	135	33.75
Total	400	100.0

The above table 4.13 shows that 265 (66.25%) respondents are satisfied with their results and 135 (33.75%) respondents are not satisfied with their results. We can see that the majority of respondents are satisfied with their results. The following figure 4.15 shows the graph of table 4.13

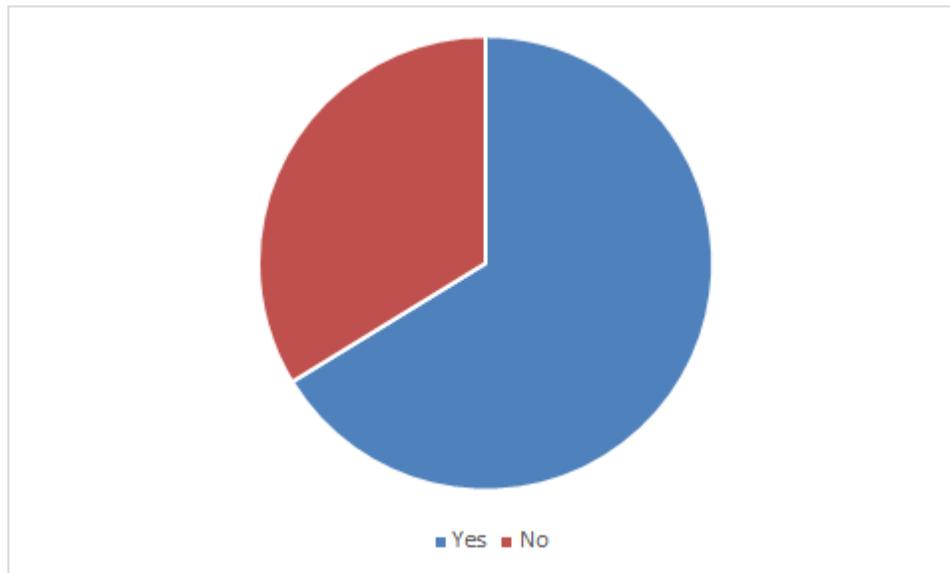


Figure 4.15: Are the respondents satisfied with their results

### 4.3.1.14 Mental Health of the Respondents

The following table 4.14 shows the mental health of the respondents from our dataset.

Table 4.14: How is the mental health of the respondents?

	Frequency	Percentage
Satisfactory	182	45.5
Average	175	43.75
In depression	43	10.75
Total	400	100.0

The above table 4.14 indicates that the mental health of 182 (45.5%) respondents are satisfactory, 175 (43.75%) respondents are average and 43 (10.75%) respondents are in depression. The following figure 4.16 shows the graph of table 4.14

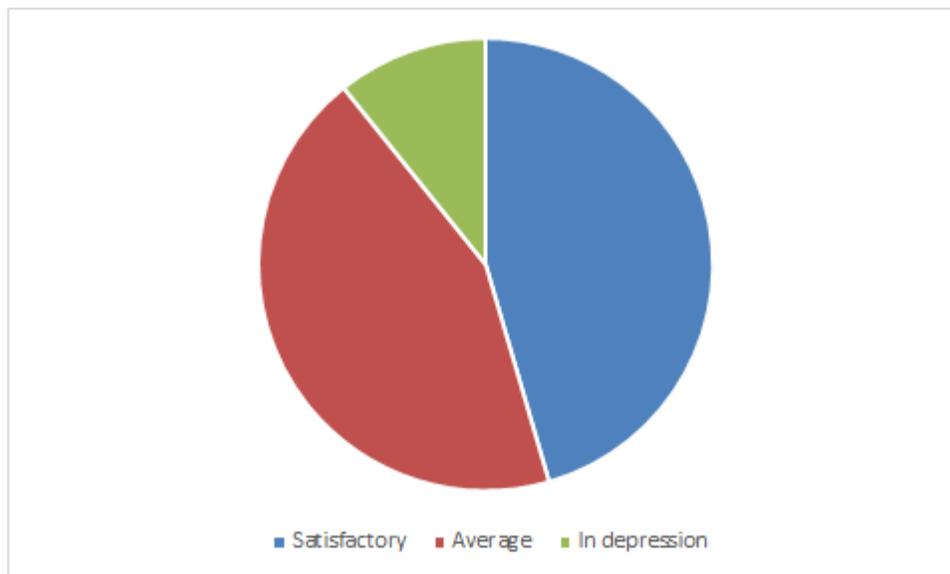


Figure 4.16: Mental health of respondents

### 4.3.1.15 Do the Respondents have Drug Addiction

The following table 4.15 indicates if the respondents have drug addiction from our dataset.

Table 4.15: Do the respondents have drug addiction

	Frequency	Percentage
Yes	54	13.5
No	346	86.5
Total	400	100.0

The above table 4.15 shows that 54 (13.5%) respondents have drug addiction and 346 (86.5%) respondents do not have drug addiction. We can see that the majority of respondents do not have drug addiction. The following figure 4.17 shows the graph of table 4.15

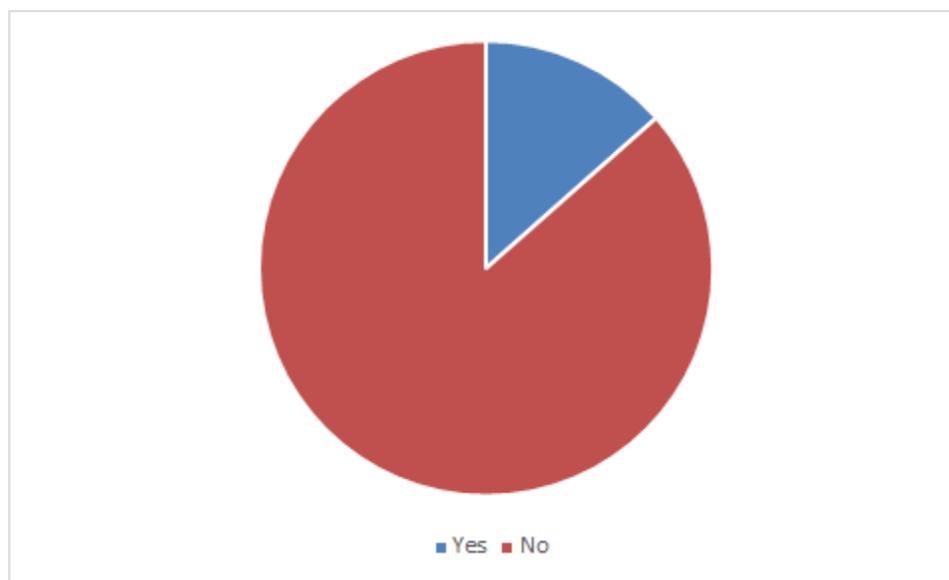


Figure 4.17: Do the respondents have drug addiction

### 4.3.1.16 Have the Respondents Grown up Any Bad Habit like Gambling or Something Else

The following table 4.16 shows if the respondents have grown up any bad habit like gambling or something else from our dataset.

Table 4.16: Have the respondents grown up any bad habit like gambling or something else

	<b>Frequency</b>	<b>Percentage</b>
Yes	22	5.5
No	378	94.5
Total	400	100.0

The above table 4.16 shows that 22 (5.5%) respondents have grown up bad habits like gambling or something else and 378 (94.5%) respondents do not have done that. We can see that the majority of respondents have not grown up any bad habits like gambling or something else. The following figure 4.18 shows the graph of table 4.16



Figure 4.18: Have the respondents grown up any bad habit

#### **4.4 Summary**

We have got the best accuracy rate 95% in Logistics Regression Algorithm. So we have chosen the Logistics Regression Algorithm the best for our model. We have revised our dataset and model. From the revision, we understand that this classifier is appropriate for all types of comparing datasets to predict whether they are accurate. This model makes it convenient to compare as well as find the outcome properly.

## **CHAPTER 5**

### **SUMMARY, CONCLUSION, RECOMMENDATION, IMPLICATION FOR FURTHER SYUDY**

#### **5.1 Summary of the Study**

Our analysis paper has been evolved to know the best suitable place for students to live in their learning period. So we have collected data from students of schools, colleges, universities, and even people from job sectors to know their perspective at the time of their study. Then we prepared the data sets that need to be trained and done with pre-processing.

#### **5.2 Conclusion**

Realizing the need for education, students leave their parents in the hope of fulfilling their dreams and go to a new unfamiliar place for better education. The main finding of this study is that the students have different opinions about the place to regularly study between home and hostel. The factors that predict students' best place to study are their suitable place for study or environment of the room, safety, privacy, and internet availability, mental health, with whom he/she is living, security, and other facilities. According to the result, safety is the first and comfortable place to study is the second most important factor for students to study. The result of the study evident that students are more likely to stay at home with their parents.

#### **5.3 Recommendation**

It is not always possible to stay/study at home. The government and management of the hostels should pay special attention to make the study environment conducive and favorable for both male and female students. Hostel management should provide students safety first and then other facilities. Students and management communication should be interactive so that students can share any kind of problems.

## **5.4 Implication for Further Study**

The major core of this research paper is to predict the better place of study for students. In present, students prefer to stay at home rather than struggling to study in a hostel. But it may change in future. If we survey on the next generation again, maybe there will be a change.

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## **APPENDIX RESEARCH REFLECTION**

During project activities, we faced several problems. Among them, three issues were major. One is choosing the best classification algorithm, making a study question and another is information gathering. Collecting data was much difficult. Because of COVID'19, we had to reach students via social media. And in a country like Bangladesh, people don't take it positively. To gather the information we faced a lot of trouble. Then after quite a while and a lot of experiments and solid production, we got accomplished.

Our data collection questions are given below:

## Hostel vs Home

These questionnaires are for just final year thesis purposes. The topic is "Hostel vs Home (best place to study) using data mining". We are collecting these data for educational purposes, not for harm. The goal of ours is only to use your data to analyze the better place to study of yours. No harmful purpose is hidden behind it. [এই প্রশ্নাবলিগুলি কেবলমাত্র চূড়ান্ত বছরের থিসিসের উদ্দেশ্যে। বিষয়টি হল হোস্টেল বনাম হোম (পেড্যাগোজির সেরা স্থান) ডেটা মাইনিং ব্যবহার করে। আমরা এই তথ্যগুলি কোনও ক্ষতি করার জন্য নয়, শিক্ষাগত উদ্দেশ্যে সংগ্রহ করছি। আমাদের লক্ষ্য কেবল আপনার অধ্যয়নের জন্য ভাল জায়গা বিশ্লেষণ করতে আপনার ডেটা ব্যবহার করা। এর পিছনে কোনও ক্ষতিকারক উদ্দেশ্য লুকিয়ে নেই।]

\* Required

1. What is your age?(In year) [আপনার বয়স কত? (বছরে)] \*

Your answer \_\_\_\_\_

2. What is your gender? [আপনার লিঙ্গ কি?] \*

- Male [পুরুষ]  
 Female [মহিলা]

3. Which is your last passed institution? [আপনার শেষ পাস করা প্রতিষ্ঠান কোনটি?] \*

- School [বিদ্যালয়]  
 College [কলেজ]  
 University [বিশ্ববিদ্যালয়]

4. Where do you live in?[আপনি কোথায় থাকেন?] \*

- Campus hostel/hall [ক্যাম্পাসের ছাত্রাবাস / হল]  
 Outside hostel [হোস্টেলের বাইরে]  
 Rent flat with friends [বন্ধুদের সাথে ফ্লট বাসা ভাড়া করে]  
 At a relative's house [আত্মীয়ের বাসায়]  
 With parents [মা বাবার সাথে]

5. With whom do you live in an outside hostel? [আপনি কার সাথে বাইরের ছাত্রাবাসে থাকেন?] \*

- Student [ছাত্র/ছাত্রী]
- Working persons [কর্মজীবী ব্যক্তি]
- Other [অন্যান্য]
- Not for me [আমার জন্য ন]

6. Where do you prefer to stay? [আপনি কোথায় থাকতে পছন্দ করেন?] \*

- Home [বাড়ি]
- Hostel [ছাত্রাবাস]

7. Why do you prefer to stay at home? [আপনি বাড়িতে থাকতে পছন্দ করেন কেন?] \*

- It is suitable for my study [এটা আমার অধ্যয়নের জন্য উপযুক্ত]
- I feel safe here [আমি এখানে নিরাপদ বোধ করি]
- I have enough privacy in here [আমার এখানে যথেষ্ট গোপনীয়তা রয়েছে]
- My parent/siblings help me in studying [আমার পিতামাতা / ভাইবোনরা আমাকে পড়াশুনার সহায়তা করে]
- I prefer hostel [আমি হোস্টেল পছন্দ করি]

8. Why do you prefer to stay in a hostel? [কেন আপনি হোস্টেলে থাকতে পছন্দ করেন?] \*

- It is suitable for my study [এটা আমার অধ্যয়নের জন্য উপযুক্ত]
- I have enough privacy in here [আমার এখানে যথেষ্ট গোপনীয়তা রয়েছে]
- I can do group study freely [আমি অবাধে গ্রুপ স্টাডি করতে পারি]
- I don't like the environment of my home [আমি আমার বাড়ির পরিবেশ পছন্দ করি না]
- I prefer home [আমি বাড়ির পছন্দ]

9. How many hours do you study regularly? [আপনি নিয়মিত কত ঘণ্টা অধ্যয়ন করেন?] \*

- 1 2 3 4 5 6 7 8 9 10
- 

10. How many hours do you access Internet regularly? [আপনি নিয়মিত কত ঘণ্টা ইন্টারনেট ব্যবহার করেন?] \*

- 1 2 3 4 5 6 7 8 9 10
- 

11. How many hours do you sleep everyday? [আপনি প্রতিদিন কত ঘণ্টা ঘুমান?] \*

- 1 2 3 4 5 6 7 8 9 10
- 

12. Where do you get better result? [আপনি কোথায় ভাল ফলাফল পাবেন?] \*

- At home [বাড়িতে]
- In hostel [ছাত্রাবাসে]

13. What was your result in last passed exam? [সর্বশেষ পাস করা পরীক্ষায় আপনার ফলাফল কী ছিল?] \*

- Best [সেরা]
- Good [ভাল]
- Average [মাঝামাঝি ধরন]
- Below average [গড়ের নিচে]

14. Are you satisfied with your result? [আপনি কি নিজের ফলাফল নিয়ে সন্তুষ্ট?] \*

- Yes [হ্যাঁ]
- No [না]

15. How is your mental health? [আপনার মানসিক স্বাস্থ্য কেমন?] \*

- Satisfactory [সন্তোষজনক]
- Average [মধ্যমস্থি ধরন]
- In depression [হতাশায়]

16. Do you have any drug addiction? [আপনার কি কোনও মাদকাসক্তি রয়েছে?] \*

- Yes [হ্যাঁ]
- No [না]

17. Have you grown up any bad habit like gambling or something else? [আপনার কি জুয়া খেলা বা এর মতো কোনো খারাপ অভ্যাস হয়েছে?] \*

- Yes [হ্যাঁ]
- No [না]

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## Hostel Vs Home

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