FOREIGN STUDENTS' ACADEMIC DATA ANALYSIS, A RECOMMENDATION FOR BANGLADESHI UNIVERSITY EDUCATION SYSTEM

BY

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

Supervisor By

Tanvir Hossain

Lecturer, Department of CSE, City University

City University (CU)

Dhaka, Bangladesh

December, 2020

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CERTIFICATE

This Project titled "**Foreign students' academic data analysis, a recommendation for Bangladeshi University education system"**, submitted by **Ismail Ahmed Ali** and **Sajid Hassan** to the Department of Computer Science and Engineering, City 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 was held on **December 24, 2020**.

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of "**Tanvir Hossain"** Department of CSE City 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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DEDICATION

"This dissertation is dedicated to our parents and teachers for all their continuous support, love and inspiration"

ABSTRACT

Higher study is a big challenge for students. For a majority of us, studying at a reputable university abroad is an imminent goal. For a long time, students from developing countries tend to seek higher study from developed countries. Higher educated peoples are playing an important role in building a civilized society and a developed nation. The more educated a nation is, the more developed it is. Almost all the countries are trying to increase the quality of their higher education day by day. Although Bangladesh is a developing country, day by day Bangladesh is also becoming the preferred country of foreign students. The purpose of this paper to Analysis foreign students' academic and lifestyle data to identify whether Bangladesh is suitable for higher education or not, those who currently in this country for higher study, are satisfied or dissatisfied. If they have any problems, what kind of problems are they experiencing, and how to resolve them. We have identified the university's problems where they need to improve so that they can attract more foreign students. For the case of foreign students, we have collected data from 399 present international students in Bangladesh. This paper has used some popular classification algorithms such as support vector machine, KNN, ANN, Random Forest and Decision Tree. We also present a comparison of used machine learning algorithms over different evaluation metrics. After all, we have analyzed the data to show which factors play a major role in students' decision making.

ACKNOWLEDGEMENT

First of all, we would like to thank our Creator Almighty Allah who has given us a sound mind and health while we are at work and given us the ability to work hard successfully.

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We would like to thank our entire course mate in City University, who took part in this discuss while completing the course work.

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LIST OF ABBREVIATIONS

UGC	Universities grants Commission
ANN	Artificial Neural Network
SVM	Support Vector Machine
KNN	K-Nearest Neighbors
DT	Decision tree
CSS	Computer Science & Engineering

LIST OF ALGORITHMS

CHAPTER 1

INTRODUCTION

The educational system encourages the full development of a person's inherent qualities and helps him to acquire the skills needed to prove himself as a productive member of society. Education is the acquisition of knowledge or skills in the general. In a broad sense, education is the process of gaining systematic knowledge, and learning is a constant process of developing as much as possible. According to Article 17 of the Constitution, every child living in Bangladesh has the right to free education up to the secondary level. Secondary and higher secondary level educational institutions are affiliated with ten (10) education committees. The boards conduct three public examinations: Junior School Certificate (JSC) examination, Secondary School Certificate (SSC) examination and Higher Secondary Certificate (HSC) examination.

Educational institutions at the higher secondary level are known as colleges. From then on, the journey of higher education of Bangladeshi students has begun.

Higher education usually involves a degree-level or degree qualification. In most developed countries, the population (up to 50%) now enters higher education at some point in their lives [Wikipedia]. Higher education is very important for the building of a civilized nation and the national economy. Civilized society has been relying on higher education institutions for many centuries with the aim of governing the region and creating leaders with diverse skills. The scope and scope of higher education expand over time and will continue to do so as the complexity of the social structure develops with the development of technical education and its adjuncts. There has been a remarkable progress in business and commerce, and in industry and communication, centered on the educated population in higher education. Recently the standard of business education and vocational education has reached a much higher level. In the field of health, specialists have appeared in various branches of health sciences rather than in general Machine.

The power of man to control and utilize natural resources has greatly increased, and natural energy has created wonderful ceremonies in special fields of knowledge. Higher education institutions must be aware of the quality of education provided in these areas.

Therefore, higher education in the modern world must be developed with many unique skills that are suitable for a large number of students.

After World War II, there is a tendency for students from poor and developing countries to seek their higher education from developed countries (Zhao 1996). Now the question is why? Every student wants to move from their current education system to a better education system. The reason is that there is a big difference between the education system in a developed country and the education system in a developing country. There are many opportunities for outdoor research. Those who study abroad are far ahead of the general public in terms of independence, self-reliance, intelligence, and creative ability. Since leaving their family and living alone in a foreign country, they are self-reliant and skilled in solving problems. Not only that, they are not lacking in any challenging task. While abroad, a student will become aware of the politics, culture, and customs of that country. In addition, he will have a different view of the world. To learn about the political affairs of the world abroad, he has to learn the language of that country, which will add another priest to his crown of experience.

Higher education abroad will not only improve a student's knowledge and academic values but also increase his or her professional skills. Every year millions of students are going to overseas to seek their higher study from Bangladesh. Before 1991 there were only eight public universities in Bangladesh. In spite of having the knowledge, there were no opportunity to seek higher study for the limited number of sits. Therefore, the government of Bangladesh took the initiative to set up public universities as well as private universities, so that Bangladeshi students can get higher education in the country. After 1991, the private university of Bangladesh started its journey. At present, 42 public universities and 109 private universities in Bangladesh have confirmed the quality of their higher education (UGC report 2018). Currently, these universities are studying with Bangladeshi students as well as foreign students (especially south Asia, Africa). In Bangladesh, the number of foreign students is increasing day by day. But after talking to the current foreign student, we found out that due to some problems (not being able to go to the desired university, not being able to afford the cost) some students came to Bangladesh and return to their country without completing their education. This threatens the student’s carrier. Because the student leaves the country for higher education and spends a lot of money behind it. Therefore, one of the challenges of the present government of Bangladesh is to ensure the safety of foreign students and how to ensure the quality of higher education.

1.1 Problem statement

Indeed, many foreign students come to Bangladesh for study but some of them go back to their origin or to another alternative for many unexplained reasons and issues that need to survey to be solved. The main objectives of this paper is to survey whether Bangladesh is suitable for higher education and those who currently in this country for higher education, are they satisfied or dissatisfied. If they have any problems, what kind of problems are they experiencing and how to resolve them.

1.2 Purpose of the study

The purpose of this study is to present the results of a study conducted on a complaint about the Survey of foreign students living in Bangladesh.

1.3 Objective of the study

1.3.1 General objective

The general objective of this study is to survey on foreign students in Bangladesh.

1.3.2 Specific objectives

I. To survey about the entry process of foreign to Bangladesh.
II. To evaluate money transferring systems available for the foreign students in Bangladesh.
III. To check up the level of social interactions between the locals and the foreign in Bangladesh.
IV. To determine the environmental issues that the foreign students face in Bangladesh.
V. To make sure the rate of health insurance available in Bangladesh.
VI. To count the limit of flexibility for the foreign students have in Bangladesh.
VII. To search about the transportation hubs in Bangladesh.

1.4 Significant of the study

This study will come up with effective and cool methods for solving the challenges of foreign students facing Bangladesh. In addition, the UGC, the foreign student community, and the Bangladesh Ministry of Education will all have access to basic information on the issue. In addition, these foreign embassies will receive points and deal with the challenges in part. The outcome of this study will be important for other foreigners (Arrived/will arrive) to Bangladesh to study higher education sectors. Finally, this study will benefit researchers by contributing a body of knowledge that will create a policy framework in order to limit and solve the challenges faced by foreign students living in Bangladesh.

1.5 Thesis Outline

The remainder of the thesis is organized as follows: -

In the second chapter, we discussed about related work. In the Third chapter, we present our mythology. In Chapter Fourth, we discussed our results and our analysis. In Chapter Fifth we made conclusion, recommendation & future work and in the final references to the report.

CHAPTER 2

LITERATURE REVIEW

The process of internationalization in higher education is progressing steadily [16].

GEORGE V. COELHO at all [1]. In their research, they described the main factors that put foreign students at risk in higher education as a result of the transfer of new cultures and environments. They Mentioned Many complications arise when young people migrate abroad for higher education as they become acquainted with new cultures and environments. So, they have to adapt to that environment as soon as possible to overcome this complication. They highlighted a life cycle of the students and they said that child's first school experience, the junior school transition, the transition from high school to college, graduate student stress, etc. Education overseas may be a major developmental and psychosocial move in a foreign student's life. Like other moves, it represents an arrangement of stages of high-risk situations that deliver emotional push as well as openings for adapting behavior.

C. D. THROSBY at all [7]. They have shown in their research how foreign students play an important role in the economic development of the host country. They described both direct and indirect costs-benefit. They have mentioned tuition fee, accommodation, meals and the costs of any additional services provided, such as special counselling, or host country language courses as a direct benefit. For the indirect benefit, they point out that local students can become acquainted with a wide variety of cultures, and that foreign students take the research sector further by participating in research. Similar to these benefits there are some possible parallel costs such as enmity from local students, unpleasant reaction by foreign students to the host institution, etc.).

There have been a few endeavors to measure the total benefits and costs of foreign students in host countries (for example, Reubens 1975[3]; Blaug 1981[4]; Jenkins 1983[5]; Winkler 1983[6]; Chishti 1984[7]; Fry 1984[8]; Manning et al.

Every country follows some foreign policy for foreign student. According to [9] prior

to 1986, about 45 to 60 per cent of foreign students in Australia were studying on scholarships. As a result, the Australian government had to pay a large subsidy every year. In 1986, the government of Australia issued a proclamation to all educational institutions in their country, asking all educational institutions to declare their course as fully paid for foreign students. As a result of the Australian Government's decision, students from many developing countries, despite their qualifications, were barred from pursuing higher education in Australia. To address this problem, the Australian government introduced the Merit Scholarship in 1990. Within 4 years of this rule, the number of foreign students in Australia increased from 24,000 to 55,000, of which 30,000 were fully paid.

Nowadays machine learning algorithms have become very popular in research. At present machine learning techniques are being used to solve other problems as well as the problems of educational institutions such as institutions, teacher quality (Góes et al. 2014[10]" Education quality measured by the classification of school performance using quality labels". Xiao-YanLiu 2015[11]" Private colleges teachers evaluation system based on support vector machine (SVM)."), examination and assessments (Muklason et al. 2017[12]") Fairness in examination timetabling: student preferences and extended formulations."), measure practices impact (Delen et al. 2013[13]" A comparative analysis of machine learning systems for measuring the impact of knowledge management practices"), learning product selection (Alptekin and Ertugrul 2010[14]" An integrated decision framework for evaluating and selecting e-learning products"; Oztekin et al. 2013[15]" A Machine learning-based usability evaluation method for eLearning systems."), course planning (Abdahllah 2015[16]" A decision support model for long-term course planning") and more.

According to Acharya A, Sinha D (2014) [17] at all. Developed a model using machine learning to predict student's performance. They have mentioned the academic performance of students depends on previous academic records, economic status, family background, performance in mid semester examination. Based on these factors they apply Decision Tree (DT). Bayesian Networks (BN), Artificial Neural Networks (ANN), Support Vector Machines (SVM).

Tan M, Shao P (2015) by using Artificial Neural Network (ANN), Decision Tree (DT) and Bayesian Networks (BNs) developed a model to predict the dropout of student in eLearning program.

Although some of these studies addressed educational problem issues at the higher education level, none have considered the satisfaction and dissatisfaction on host country. While previous research focuses on prediction, the most commonly used algorithms are artificial neural networks and support vector machines. Some authors, including ourselves, go further into comparing these algorithms' performance. After revising other articles that had different goals, we learned of other machine learning algorithms that have been used, such as linear regression, logistic regression, random forest, adaptive boosting and others.

Islam, Miah, Kamal & Burmeister. "Approaches to Measure Mental Health Conditions." Australasian Journal of Information Systems, 2019, Vol 23, Research on Health Information Systems.

CHAPTER 3

METHODOLOGY

In this chapter, we explain the proposed methods that has been used for our data that introducing the data collection and features extraction. In addition, we present how we can build the system for train and test. After that, we present how we can classify and incorporate the data.

3.1 Proposed method

- Collecting real field data.
- Data pre- processing.
- Train Model.
- Test Model with test data.
- Apply Machine Learning Techniques: -
  - SVM
  - ANN
  - KNN
  - Decision Trees
  - Random Forest
- Find predicting accuracy.

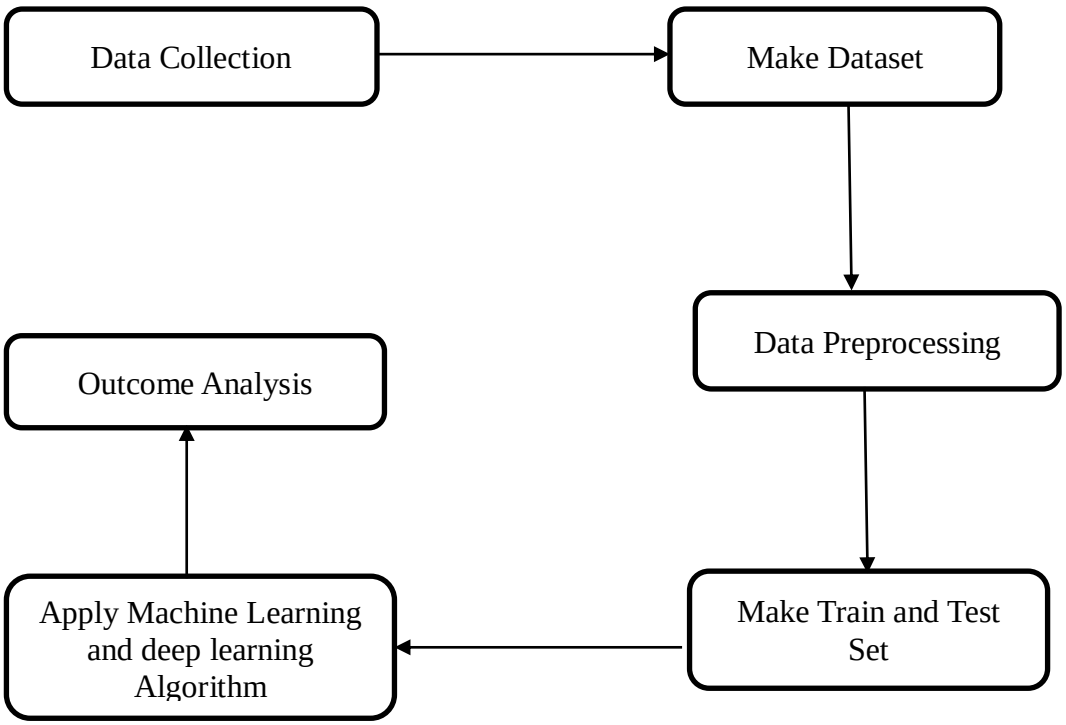

Figure 1: Proposed method

3.2 Data collection

We have collected data from foreign students studying in Bangladesh universities such as (Daffodil University, Independent University, Dhaka International University, City University, Asian University, IUBAT University and so on). The dataset contains the current situation of foreign students. This dataset contains 25 columns where each column speaks to a special piece of data about a foreign student. Since every column provides valuable information for satisfaction or dissatisfaction of foreign students. So, in this paper, we selected all 25 columns generally, these columns contain both "satisfied" and "dissatisfied"

Foreign students' information. The dataset contains 399 rows and 25 columns based on the following questions which are shown below.

1. It's easy to visa processing from your country to Bangladesh?
2. After coming to Bangladesh are you face any complexity of visa?
3. Is it easy to send money from your country to Bangladesh?
4. Do you feel safe in Bangladesh?
5. Has the government of Bangladesh given you any insurance?
6. Do you satisfy with the accommodation in Bangladesh?
7. Bangladeshi classmates are friendly?
8. Are Bangladeshi teachers friendly and helpful?

9. Are General people of Bangladesh friendly?
10. Are Bangladeshi police helpful?
11. Do you have to pay any tax in Bangladesh?
12. Can you use ATM card in Bangladesh?
13. In Bangladesh are you a victim of racial decimation?
14. Do you face any problem with food?
15. Do you face any problem with changing climate?
16. Do you face any political problem?
17. Do you face any corruption?
18. Do you face any problem with the Bangladeshi education curriculum?
19. Are you satisfied with the health service of Bangladeshi hospitals?
20. Do you enjoy the festivals of Bangladesh?
21. Do you face any problem on the first meeting?
22. Can you buy any vehicle in Bangladesh easily?
23. Is there any problem to celebrating the own religion?
24. Do you face sexual harassment?
25. What is your gender?

3.3 Ground Truth Dataset

This segment talks about the method utilized to develop our dataset with ground truth label information (on whether the foreign students satisfied or dissatisfied). We use our dataset and split it into two sets: - (1) for the positive side we take 1 means satisfied student and (2) for the negative side we take 0 means dissatisfied student. We analyzed around 399 records of foreign students where 80% gotten 1 and 20% gotten 0, so it means that the majority of the respondents were satisfied.

Table 1 outlines the outline of foreign students.

Total number of students	399
Satisfied students	279
Dissatisfied students	120

Table 1: Data set

3.4 classification model

The machine learning classification has two steps, one is the learning step and the other is the prediction step. Learning data is provided to teach the machine and data is provided to predict the prediction step.

This stage develops a prediction model for satisfaction/dissatisfaction recognition, by considering the features as input. Considering our preparing corpus B = p_1, p_2.....p_n on n students' data, such that each information pi is labeled with the class either satisfaction or dissatisfaction, where l – $l_1|l_2$. The task of classifier f is to discover the corresponding label for each student data.

$$f: B \in L \qquad f(p) = l$$

In this work, we employ as far three well-known classifiers: support vector machine (SVM), Decision Tree (DT), Random Forest (RF), k-nearest neighbor (KNN).

3.4.1 Artificial Neural Network

Network means basically a set of nodes where node is connected to each other in some way (directly or through anything). A neural network is a network of neurons where neurons are interconnected and can exchange information with each other. The neurons are arranged in one or more layers. The calculation of data is done according to the layer and information is exchanged from one layer to another. Below is a picture of a very common neural network.

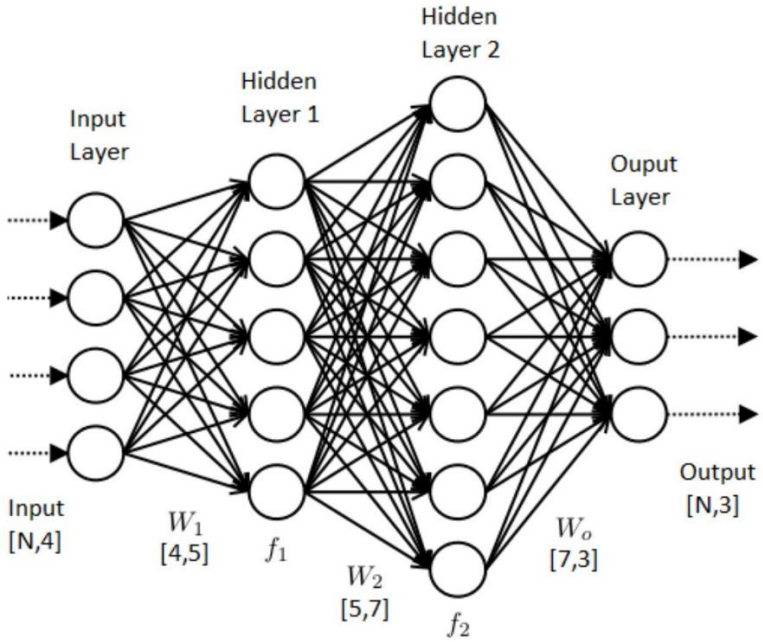

Figure 2: Artificial Neural Network

The layers are classified into three categories namely the input layer, hidden layer, and output layer. The connections between neurons connection are assigned specific weight. The connections between neurons correspond to a few weights.

So, training a neural network involves altering all those weights such as in the case given an input after performing all the calculations it gives the proper output. In this backpropagation algorithm first, we go in one way from input to output and after that propagate back from the output to input adjusting weights. There's too a bias unit whose weights are balanced. And at last, an activation function is used to get the proper output according to the training set. The backpropagation is rehashed until the error is decreased to a really little esteem. The multilayer perceptron is more advantageous with features like non-linear mapping and noise tolerance. It is more used in data mining since of its great behavior with respect to predictive knowledge

3.4.2 Support vector machine:

Support vector machine is supervised learning model. It is used in classification and regression machine learning problems. The main goal of SVM is to separate the classes by drawing a hyper line with the highest margin between the two classes. Notice the figure below, the points of the two classes closest (‘solid round’ ‘solid square) of them are called support vectors. The distance between these support vectors is called the margin. The higher the margin, the less likely the points are to be misclassified. Because the closer the points of two different classes are, the more likely they are to overlap. Supported vector machine help to decipher boundary and margin. Other points of a class are not as important as the classification, except for the support vectors. If there are two hyper plans in which A can properly classify the two-class, but the margin is very low. On the other hand, the margin of B is too high but there are some errors. A will be selected. This higher dimensional dividing is known as the SVM kernel and can be defined by any mathematical surface. A few of the more common kernels are linear, quadratic, polynomial and Gaussian radial basis function.

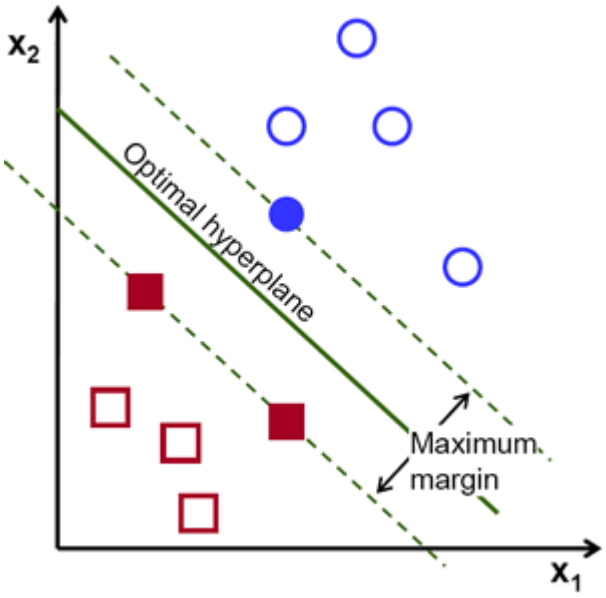

Figure 3: Support Vector Machine

3.4.3 K-Nearest Neighbors

K-Nearest neighbor algorithm (k-NN) is a non-parametric and lazy (training is not required) method. It is a supervised machine learning algorithm. K-Nearest neighbor algorithms (k-NN) can solve both classification and regression problems. The 'k' in KNN algorithm is the number of nearest neighbors taken into consideration. In this model, the value of k has determined by the square root of the total data.

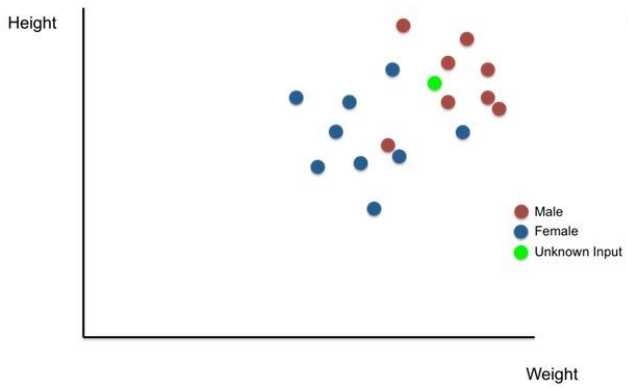

Figure 4: Before k-NN Classification

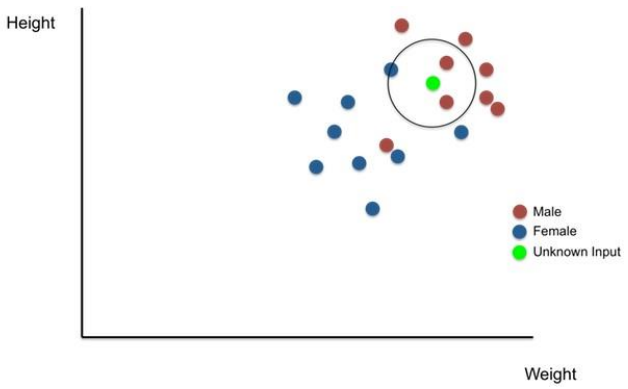

Figure 5: After k-NN Classification

Figures 4 & 5 show the scenario before k-NN classification and after k-NN Classification.

Here, 'unknown' has to be put in one of the two classes – 'Male or 'Female.

With Unknown input as center and radius sufficient to encircle 3 nearest neighbors (k=3), a circle is drawn. Class of unknown input is defined based on the majority.
The four main step of the algorithm are: -

- All other data points must be calculated from unknown data points.
- Ascending or descending orders should be resorted according to the distance standard.
- The first k is to take the data points from the sorted data points.
- Unknown data point should be identified in that class as the number of data points in which this class has the highest number of times.

3.4.4 Decision Tree

Decision tree is supervised learning algorithms. It can be used for solving regression and classification problems too. In this algorithm, data is split by a particular node. a child note is created after each value is split. If the subset of each child node is the target value then it will stop otherwise recursive split will occur. This algorithm uses an algorithm called ID3 to select the root note and adjust the order of intermediate notes.
The id3 algorithm uses the greedy method approach to get a decision tree that returns the highest information gain or minimum entropy.

Entropy: entropy is, if a dataset is partitioned against a feature, then how well that partitioning can partition the target variable's column

$$E(S) = \sum_{i=1}^{c} -P_i \log 2\ P_i$$

Gain: Information gain is based on the decrease in entropy after a dataset is
Split on an attribute.

$$Information\ Gain = Entropy\ (before) - \sum_{j=1}^{k} Entropy(j,\ after)$$

3.4.5 Random Forest:

Decision tree is supervised learning algorithms. It can be used for solving regression and classification problems too, it is mainly used for classification problems. Forest means the sum of many trees. Similarly, random forest is the sum of many decision trees.

Random Forest completes its tasks by following the steps below: -

- To begin with the selection of random samples from a given dataset.
- Following, this algorithm will develop a decision tree for each sample. At that point, it will get the prediction result from each decision tree.
- At the last stage, it will take result depending upon the majority voting.

3.5 performance evaluation

The purpose of this paper is whether Bangladesh is suitable for higher education and those who currently in this country for higher education, are they satisfied or dissatisfied. For this, we have used some popular classification algorithms, such as support vector machine (SVM), Artificial Neural Network (ANN), K-Nearest Neighbor (KNN), Decision Tree (DT) and Random Forest (RF). And we used some performance metrics to evaluate the performance of these algorithms. These metrics include Recall, False Positive rate (FPR), F-measure, Accuracy and Precision.

A confusion matrix is an easy way to calculate algorithm performance. Where the output can be of two or more types of classes. confusion matrices are two-dimensional matrices, dimensions are 'Actual', 'Predict' and more, each dimension have “True Positives (TP)”, “True Negatives (TN)”, “False Positives (FP)”, “False Negatives (FN)” as shown below –

Actual Class	Predicted Class	
	Negative	Positive
Negative	TN	FP
Positive	FN	TP

Accuracy means calculating how many accurate predictions an algorithm can make (TP and TN).

$$Accuracy = \frac{TP + TN}{TP + FP + FN + TN}$$

Precision means the ratio of the number of positive predictions to the number of positive predictions the algorithm ha made.

$$Precision = \frac{TP}{TP + FP}$$

Recall is the ratio of true positives to the cases that are actually positive. It is the percentage of corrected cases that are selected.

$$Recall = \frac{TP}{TP + FN}$$

F-measure is the harmonic mean of precision and recall.

$$F = 2\frac{Precision * Recall}{Precision + Recall}$$

3.6 Limitation of the study

During the data collection of this study, we encountered a number of problems such as security challenges, lack of access to some respondents, and fear of Covid -19. In addition to that, there was a language barrier where some of the respondents could not speak English. Father more; sometimes there was traffic jam while it could not reach to the intended area on time. In rare cases, the weather was not good at all because raining, sunny, or windy. Indeed, when conducting data, it is common to be prepared for any type of challenge that may arise from the environment or community.

3.7 Ethical consideration

During the data collection, the respondents were respected, looked after their privacy, confidentially taken their comments, **vulnerable groups of people were behaved kindly according to their situation, and culturally not harmed anyone.**

CHAPTER 4

EXPERIMENTAL ANALYSIS

This chapter focuses on the data analysis and findings from 25 questionnaires done by respondents of different parts of foreign students in Bangladesh. The data from the questionnaires were statistically analyzed and used Python for the data analysis.

4.1 Dataset Description:-

Total data	Attribute	Satisfied	Dissatisfied
399	25	279	120

Table 2: Dataset Description

4.2 Accuracy that we got by applying algorithm in python:-

Algorithms	Accuracy	Precision	Sensitivity	Specificity
SVM	**0.94**	0.93	1.0	0.98
KNN	0.85	0.59	1.0	0.85
DT	0.83	0.86	0.88	0.94
RF	0.90	0.65	1.0	0.89
ANN	0.80	0.92	0.80	0.78

Table 3: Accuracy of Algorithms

4.3 Why support vector machine gives high accuracy?

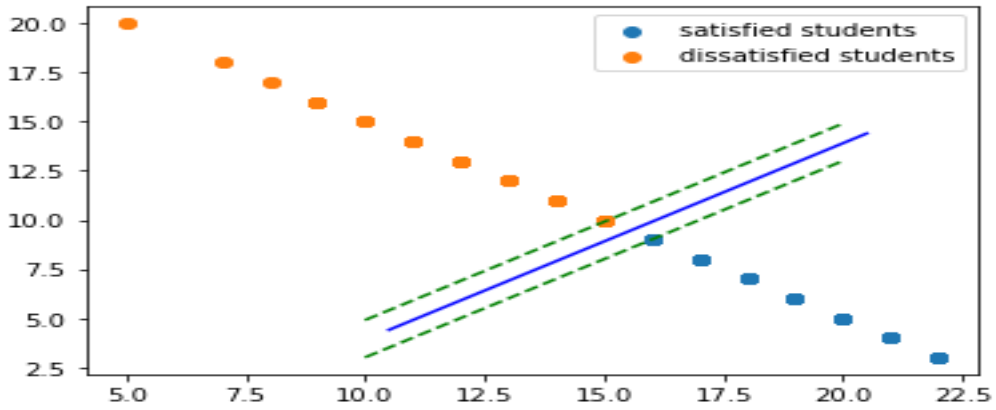

Figure 6: SVM data lot

4.4 Data analysis according to total dataset: -

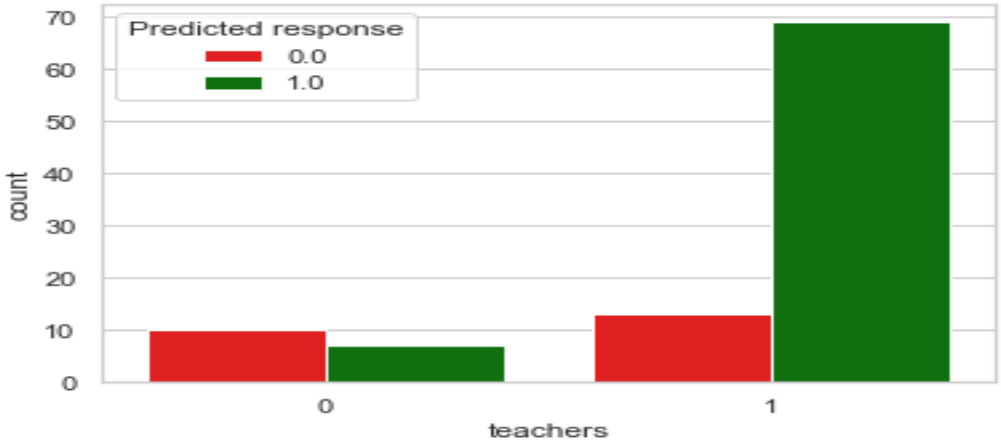

Figure 7

The figure above shows us the respondent of teachers, in case 1 represents the number of students satisfied with this issue, so it means that approximate 82% of students are satisfied, among 13% of them are dissatisfied with the overall system whereas other 69% of them are satisfied with the overall system and in case 0 represents the number of students dissatisfied with this issue, so it means 18% of students are dissatisfied, among 10% of them are dissatisfied with the overall system whereas other 8% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

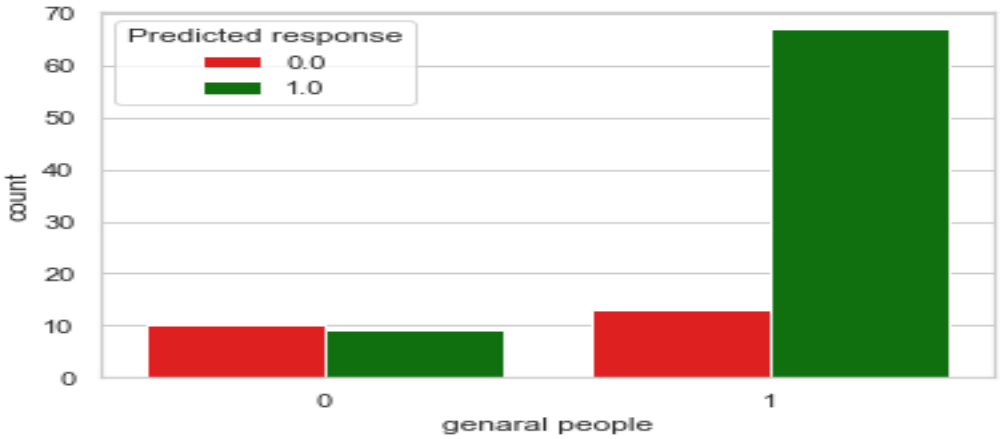

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Figure 8

The figure above shows us the respondent of general people, in case of 1, approximate 81% of students are satisfied, among 13% of them are dissatisfied with the overall system whereas other 68% of them are satisfied with the overall system and in case of 0, approximate 19% of students are dissatisfied, among 10% of them are dissatisfied with the overall system whereas other 9% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

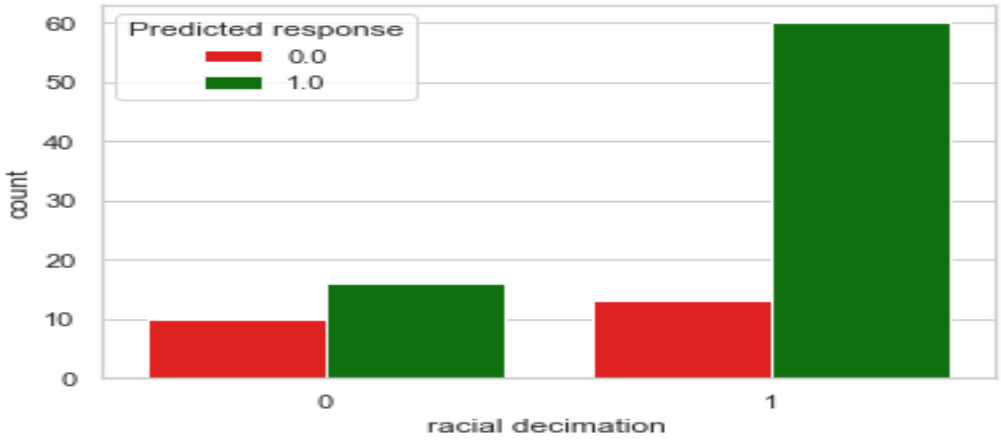

Figure 9

The figure above shows us the respondent of racial decimation, in case of 1, approximate 73% of students are satisfied, among 13% of them are dissatisfied with the overall system whereas other 60% of them are satisfied with the overall system and in case of 0, approximate 26% of students are dissatisfied, among 10% of them are dissatisfied with the overall system whereas other 16% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

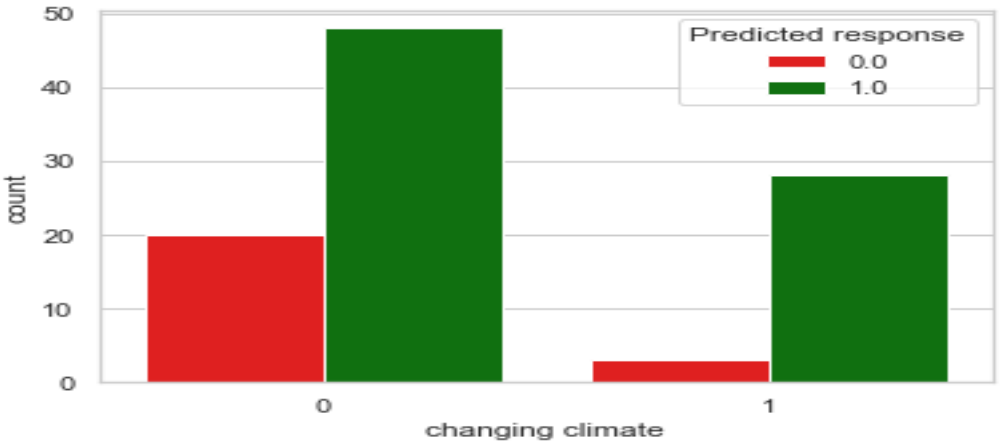

Figure 10

The figure above shows us the respondent of change climate, in case of 1, approximate 32% of students are satisfied, among 4% of them are dissatisfied with the overall system whereas other 28% of them are satisfied with the overall system and in case of 0, approximate 68% of students are dissatisfied, among 20% of them are dissatisfied with the overall system whereas other 48% of them are satisfied with the overall system. The interpretation is that most respondents were dissatisfied.

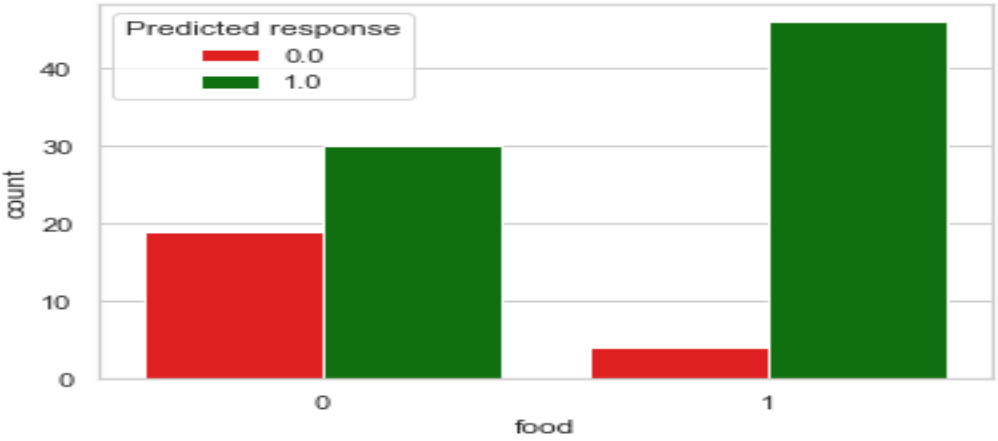

Figure 11

The figure above shows us the respondent of food, in case of 1, approximate 51% of students are satisfied, among 4% of them are dissatisfied with the overall system whereas other 47% of them are satisfied with the overall system and in case of 0, approximate 49% of students are dissatisfied, among 19% of them are dissatisfied with the overall system whereas other 30% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

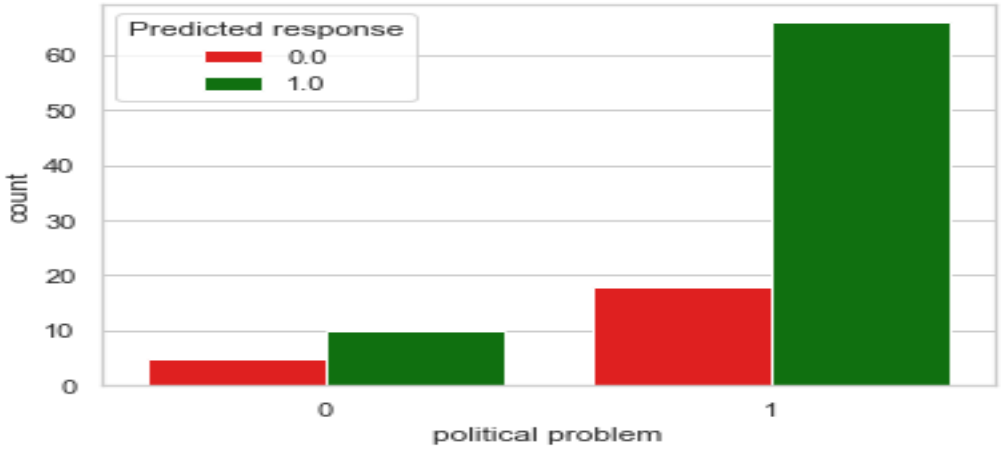

Figure 12

The figure above shows us the respondent of a political problem, in case of 1, approximate 85% of students are satisfied, among 18% of them are dissatisfied with the overall system whereas other 67% of them are satisfied with the overall system and in case of 0, approximate 25% of students are dissatisfied, among 5% of them are dissatisfied with the overall system whereas other 10% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

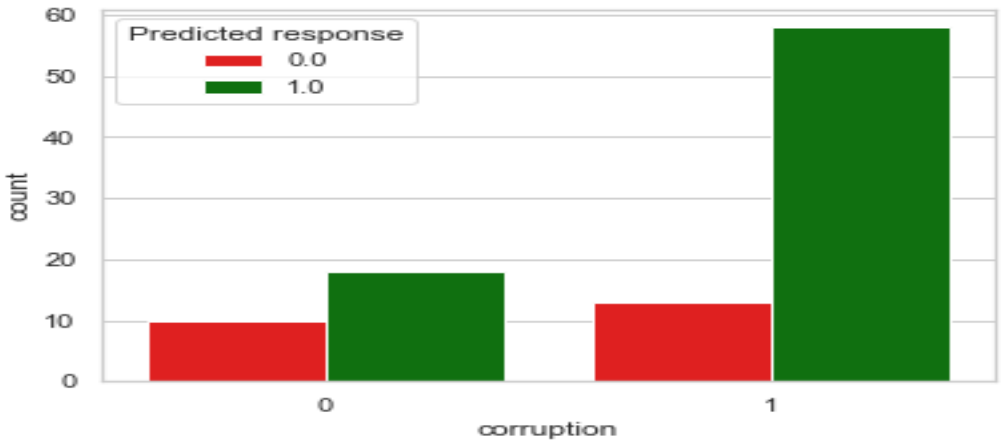

Figure 13

The figure above shows us the respondent of corruption, in case of 1, approximate 70% of students are satisfied, among 12% of them are dissatisfied with the overall system whereas other 58% of them are satisfied with the overall system and in case of 0, approximate 28% of students are dissatisfied, among 10% of them are dissatisfied with the overall system whereas other 18% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

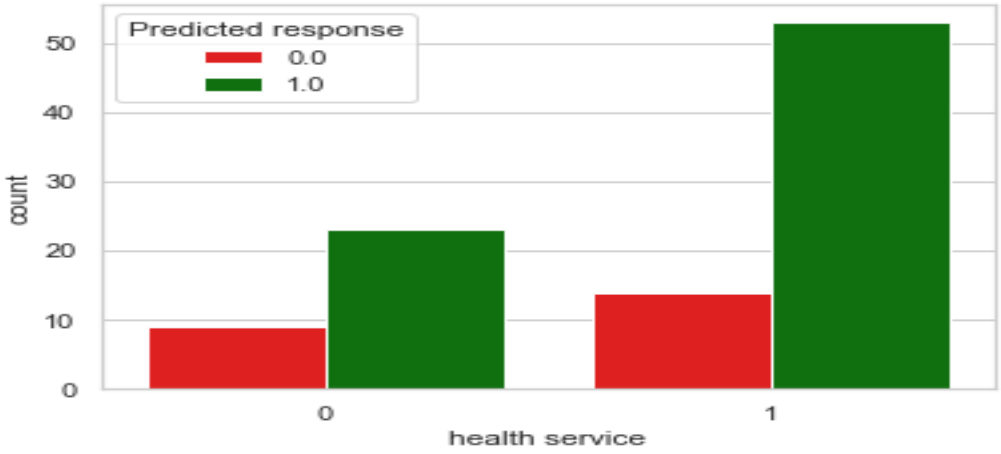

Figure 14

The figure above shows us the respondent of health service, in case of 1, approximate 67% of students are satisfied, among 13% of them are dissatisfied with the overall system whereas other 54% of them are satisfied with the overall system and in case of 0, approximate 32% of students are dissatisfied, among 9% of them are dissatisfied with the overall system whereas other 23% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

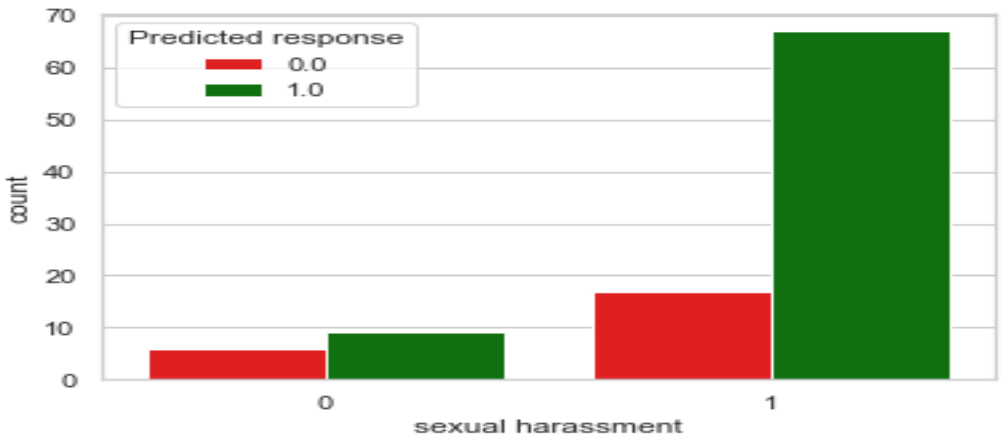

Figure 15

The figure above shows us the respondent of sexual harassment, in case of 1, approximate 85% of students are satisfied, among 17% of them are dissatisfied with the overall system whereas other 67% of them are satisfied with the overall system and in case of 0, approximate 16% of students are dissatisfied, among 7% of them are dissatisfied with the overall system whereas other 9% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

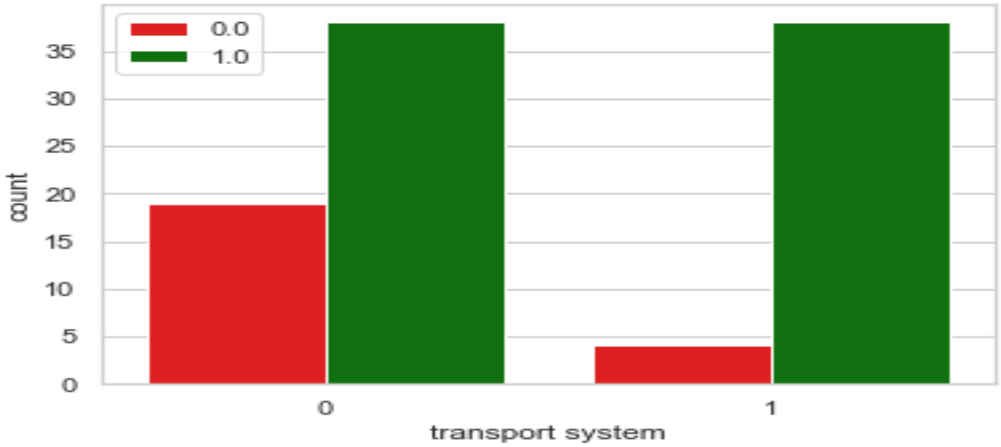

Figure 16

The figure above shows us the respondent of the transport system, in case of 1, approximate 42% of students are satisfied, among 4% of them are dissatisfied with the overall system whereas other 38% of them are satisfied with the overall system and in case of 0, approximate 57% of students are dissatisfied, among 19% of them are dissatisfied with the overall system whereas other 38% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

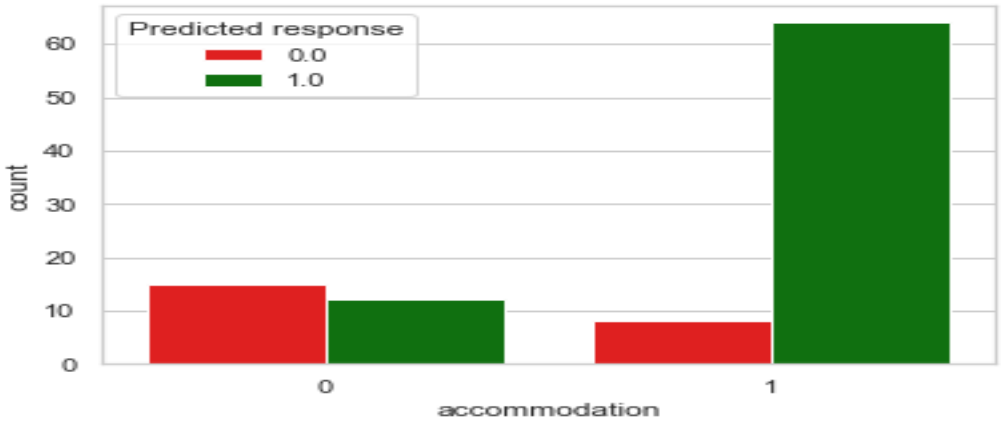

Figure 17

The figure above shows us the respondent of transport system, in case of 1, approximate 72% of students are satisfied, among 8% of them are dissatisfied with the overall system whereas other 64% of them are satisfied with the overall system and in case of 0, approximate 26% of students are dissatisfied, among 14% of them are dissatisfied with the overall system whereas other 12% of them are satisfied with the overall system. The interpretation is that most respondents were satisfied.

CHAPTER 5

CONCLUSION

This chapter consists of the overall conclusion, a recommendation based on the study, and future work

5.1 Overall Conclusion

In Bangladesh, foreign students are facing a lot of problems. So we have collected data from those who are currently studying in Bangladesh. And we have applied some popular machine learning algorithm to discover the problem. We have seen five machine learning algorithms, SVM gives us high accuracy.

In this study, respondents have agreed that this research topic is important and need to have done.

- ✓ Major outcome:

1. Most foreign students did not oppose the political system in Bangladesh.
2. Bangladeshi people are friendly and warmly welcomed to the foreigners.
3. Most of the respondents have agreed that Bangladesh teachers are friendly and helpfully.
4. Almost of the respondents agreed that they haven't face climate change.
5. Most of the respondents have agreed that the accommodation in Bangladesh is good.

5.2 Recommendation

Based on the findings of this study and the conclusions drawn above, the following recommendations are made. We would recommend the following things to do:

1. Student visa duration should be extended.
2. Student visa renewal stations number in Bangladesh should be increased.
3. Student visa renewal process should be easier for the students.
4. Universities should increase the health insurance rate that they give to the foreigners.
5. Universities should aware of foreign student's visa process from A up to Z.
6. Bangladesh police should help the foreign students more than they are giving now.
7. UGC should give extra attention to the foreign students in checking, welcoming and doing internships and so on.

5.3 Future work

We will try to extend our dataset and also, we will try to apply several Machine learning, Deep Learning or some other tools to train and test our data.

REFERENCES

1. GEORGE V. COELHO, Ph.D. “THE FOREIGN STUDENT'S SOJOURN AS A HIGH RISK SITUATION: THE "CULTURE-SHOCK" PHENOMENON RE-EXAMINED” Uprooting and Surviving, 101-107.
2. C. D. THROSBY.” The financial impact of foreign student enrolments” Kluwer Academic Publishers research on Higher Education 21: 351-358, 1991.
3. Reubens, E. P. (1975). 'The new brain drain from developing countries: international costs and benefits, 1960-1972', in Leiter, R. D. (ed.), Costs and Benefits of Education. Boston: Twayne Publishers, pp. 178-215.
4. Blaug, Mark (1981). 'The economic costs and benefits of overseas students', in Williams, Peter (ed.), The Overseas Student Question. Studies for a Policy. London: Heinemann, pp. 47-90.
5. Jenkins, H.M. (1983). 'Economics: analysing costs and benefits', in Jenkins H.M. et al. (eds.), Education of Students from Other Nations. San Francisco: Jossey Bass, pp. 237-250.
6. Winkler, D. R. (1983). 'The costs and benefits of foreign students in US higher education', Journal of Public Policy 4 (2), 115-138.
7. Chishti, S. (1984). 'Economic costs and benefits of educating foreign students in the United States', Research in Higher Education 21 (4), 397--414.
8. Fry, Gerald (1984). 'The economic and political impact of study abroad', Comparative Education Review 28, 203-220.
9. THE AUSTRALIAN DEPARTMENT OF EMPLOYMENT, EDUCATION AND TRAINING.” Programmes and policies for foreign students in Australia” country report on Australia Higher Education 21: 379-388, 1991.
10. Góes ART, Arns Steiner MT, Steiner Neto PJ (2014) Education quality measured by the classification of school performance using quality labels. Appl Mech Mater 670:1675–1683.

11. Xiao-YanLiu (2015) Private colleges teachers evaluation system based on support vector machine (SVM). In: International Conference on Applied Science and Engineerin Innovation ASEI 2015, no. Asei, pp. 1918–1921.
12. Muklason A, Parkes A, Ozcan E (2017) Fairness in examination timetabling: student preferences and extended formulations. Appl Soft Comput 55:302–318.
13. Delen D, Zaim H, Kusey C (2013) a comparative analysis of machine learning systems for measuring the impact of knowledge management practices. Decis Support Syst 54:1150–1160.
14. Alptekin E, Ertugrul K (2010) an integrated decision framework for evaluating and selecting e-learning products. Appl Soft Comput 11:2990–2998.
15. Oztekin A, Delen D, Turkylmaz A (2013) A Machine learning-based usability evaluation method for eLearning systems. Decis Support Syst 56:66–73.
16. Abdahllah M (2015) a decision support model for long-term course planning. Decis Support Syst 74:33–45.
17. Anal Acharya, Devadatta Sinha 2014 “Early Prediction of Students Performance using Machine Learning Techniques” International Journal of Computer Applications (0975 – 8887) Volume 107.