Tentative Title: Foreign students' academic data analysis, a recommendation for Bangladeshi University education system

Presented by

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Presentation Outline

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Picture courtesy: Preparation   Outline, Pi4i.com

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What is it?

Bangladesh is a developing country but **day by day Bangladesh is also becoming the preferred country of foreign students**. **International students play a vital role for their host countries**. They are bringing themselves and their tuition fees, international students also bring a breadth and depth of current and future benefits for their host countries! **But many of them go back to their country without finishing their studies or migrate to our neighboring countries like India and Pakistan**. So, in this research work we are going to Analysis of foreign students' academic and lifestyle data in Bangladesh and **we are trying to identify the university's problems where they need to improve so that they can attract more foreign students**. we have applied four popular machine learning algorithms and one deep learning algorithm such as SVM, DT, KNN,DT,ANN.

Research Topic

Machine learning: Machine learning (ML) is a category of algorithm that allows software applications to become more accurate in predicting outcomes without being explicitly programmed.

Deep learning: Deep learning is an artificial intelligence function that imitates the workings of the human brain in processing data and creating patterns for use in decision making.

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Research Challenges

1. Collecting data from different university of Bangladesh.

2. Handling categorical Data.

3. Train several machine learning model and test.

4. Analysis outcomes.

Picture courtesy: http://www.topsocialscoop.com

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Related Works

1. Käser T, Hallinen NR, Schwartz DL " **Modeling exploration strategies to predict student performance within a learning environment and beyond.**" 17th International conference on learning analytics and knowledge 2017, pp 31–40.

Contribution:

1. Used data mining.
2. Achieved accuracy between 60% - 80%
3. They introduced a high quality of dataset.

Limitation:

1. They did not use Deep Learning

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Related Works(cont.)

2. Mushtaq Hussain, Wenhao Zhu, Wu Zhang, Syed Muhammad Raza Abidi, Sadaqat Ali1. **"Using machine learning to predict student difficulties from learning session data."** et al. Springer-Verlag GmbH Germany(2018) 6:8.

Contribution:

1. Used ANN and SVM algorithms for classification.
2. For analysis data, they used MATLAB 2016b.
3. classifiers results are almost between 60 and 80%.

Limitation:

1. Worked with a small dataset.
2. They did not use data mining.

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Related Works

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

Contribution:

1. Develop Electronic health management system.
2. Achieved accuracy between 95.1% - 99%
3. They introduced a high quality of dataset.

Limitation:

1. They did not use Deep Learning

Related Works(cont.)

4. Md. Rafqul Islam, Muhammad Ashad Kabir, Ashir Ahmed3, Abu Raihan M. Kamal, Hua Wang and Anwaar Ulhaq. "**Depression detection from social network data using machine learning techniques**." Islam et al. Health Inf Sci Syst (2018) 6:8.
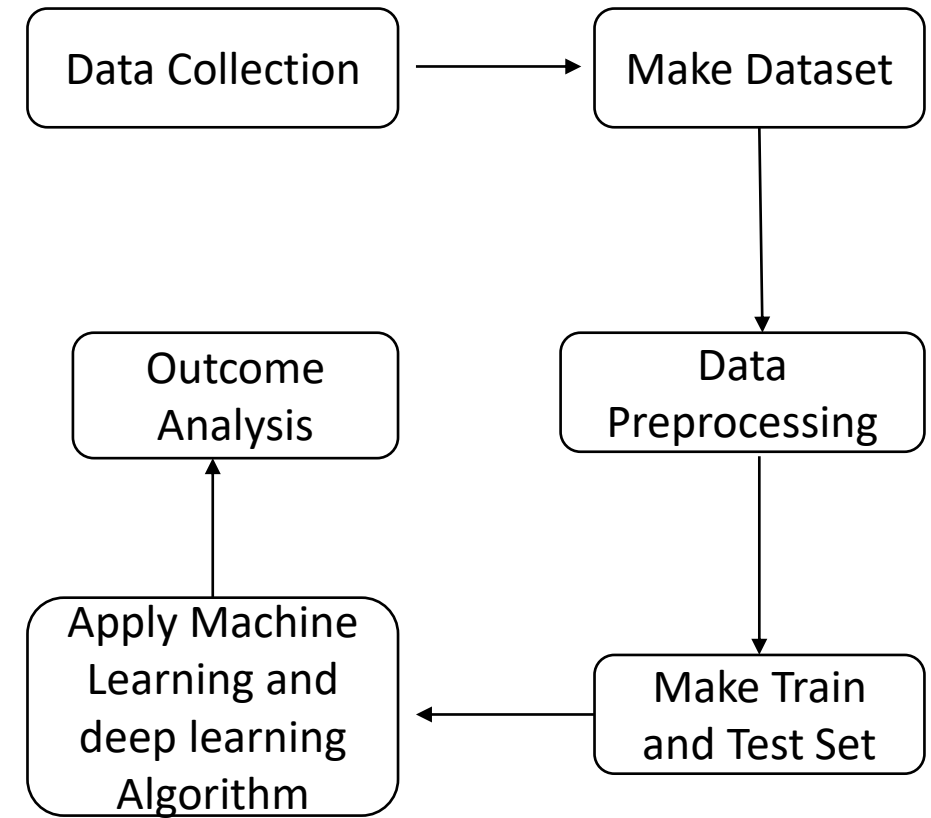
Contribution:

1. Used DT, KNN, SVM algorithms for classification.
2. For analysis data, they used MATLAB 2016b.
3. classifiers results are almost between 60 and 80%.

Limitation:

1. Worked with a small dataset.
2. They did not use data mining.

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Proposed Method (Classification/Prediction)

- Collecting real field data.
- data pre- processing.
- Train Model.
- Test Model with test data.
- Apply Machine Learning Techniques
  -SVM
  -KNN
  -DT
  -RF
  -ANN
- Find predicting accuracy.

```
Data Collection ───────▶ Make Dataset
                                │
                                ▼
Outcome                      Data
Analysis                     Preprocessing
   ▲                            │
   │                            ▼
Apply Machine           Make Train
Learning and     ◀──────  and Test Set
deep learning
Algorithm
```

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Tools

- Jupiter Note Book(python)
- SPSS
- Microsoft Excel

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Experimental Analysis

Dataset Description:

Total data	Attribute	Satisfied	Dissatisfied
399	25	279	120

Experimental Analysis(Con.)

Accuracy that I got by applying Algorithm in python(Jupyter Notebook) :

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	0.84
ANN	0.80	0.92	0.80	0.78

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Experimental Analysis(Con.)

Why support vector machine gives high accuracy?
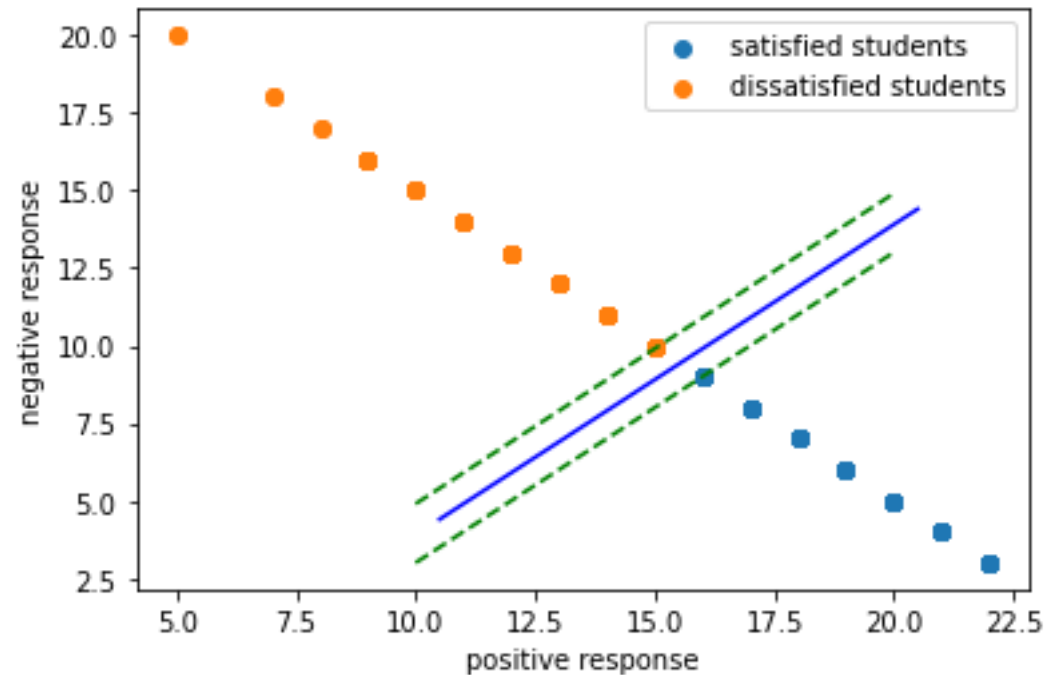
Fig-1.1: SVM data plot

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Data analysis according to total dataset :
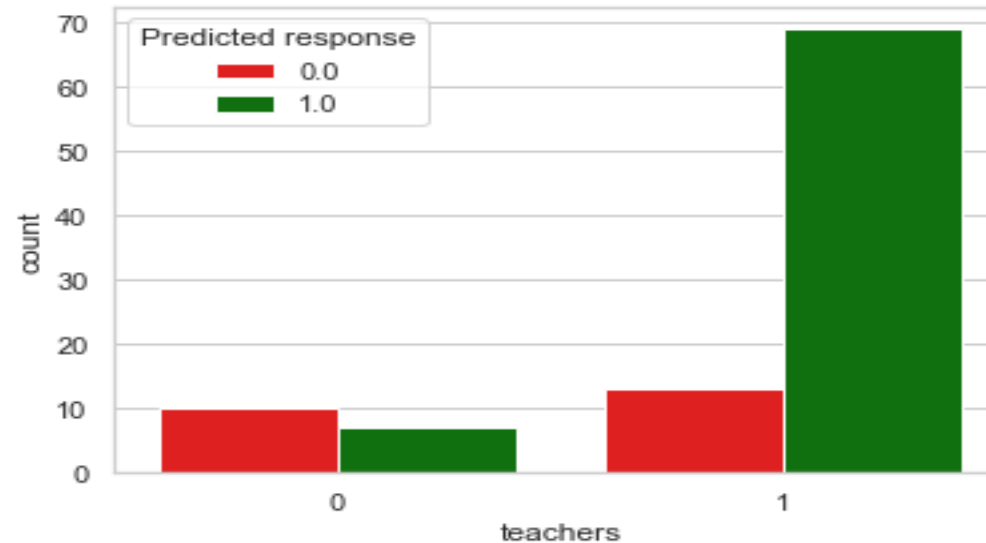
Fig-1.2: satisfied or dissatisfied on teacher and overall system

Experimental Analysis(Con.)

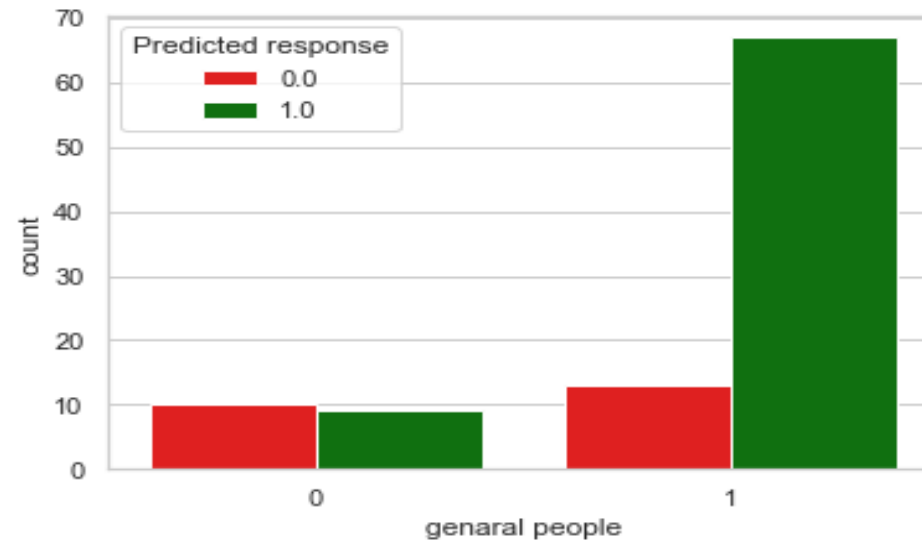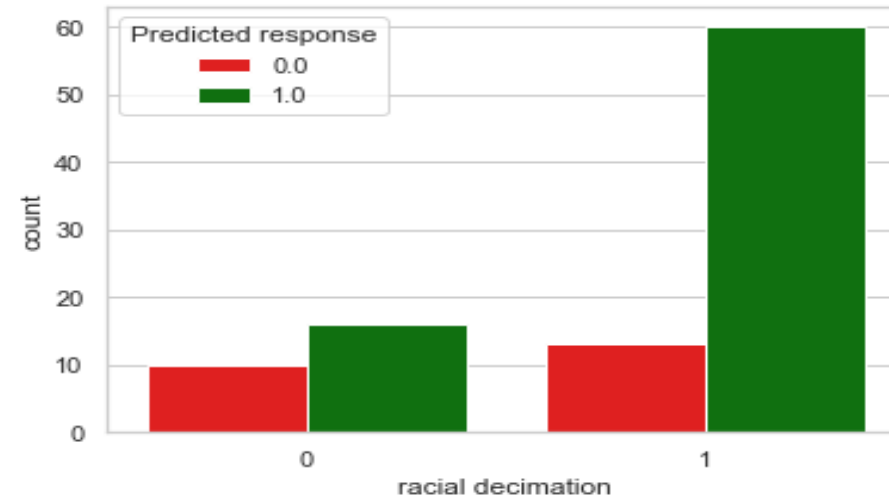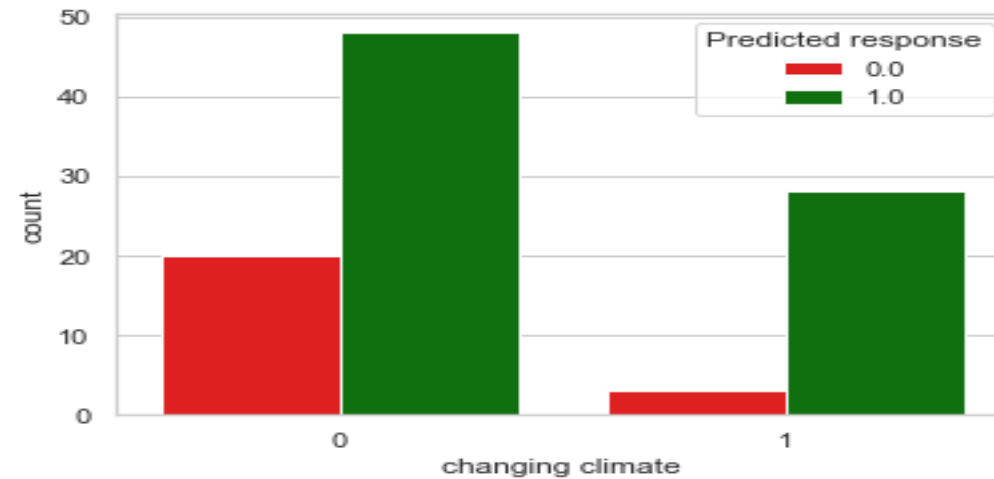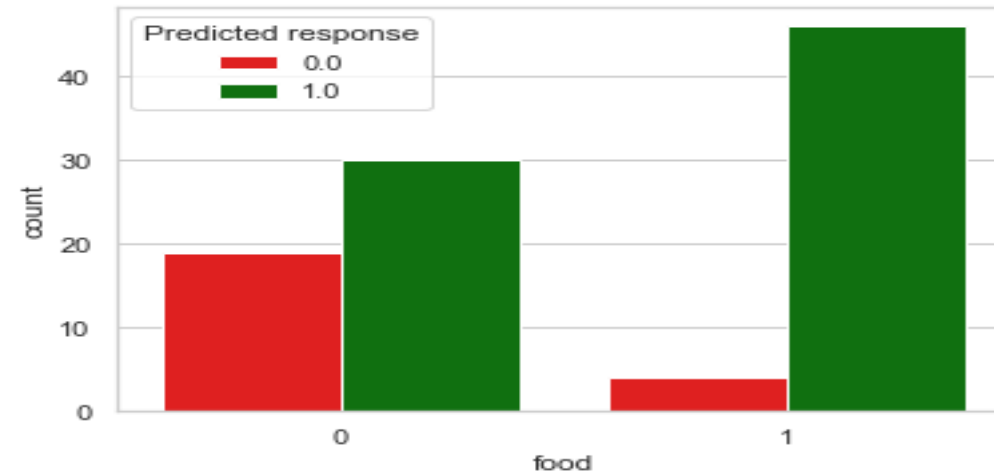**Data analysis according to total dataset :**

Fig-1.3: satisfied or dissatisfied on general people and overall system

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Data analysis according to total dataset :

Fig-1.2: satisfied or dissatisfied on racial decimation and overall system

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Experimental Analysis(Con.)

Data analysis according to total dataset :

Fig-1.2: satisfied or dissatisfied on changing climate and overall system

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Data analysis according to total dataset :

Fig-1.2: satisfied or dissatisfied with food and overall system

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Experimental Analysis(Con.)

Data analysis according to total dataset :
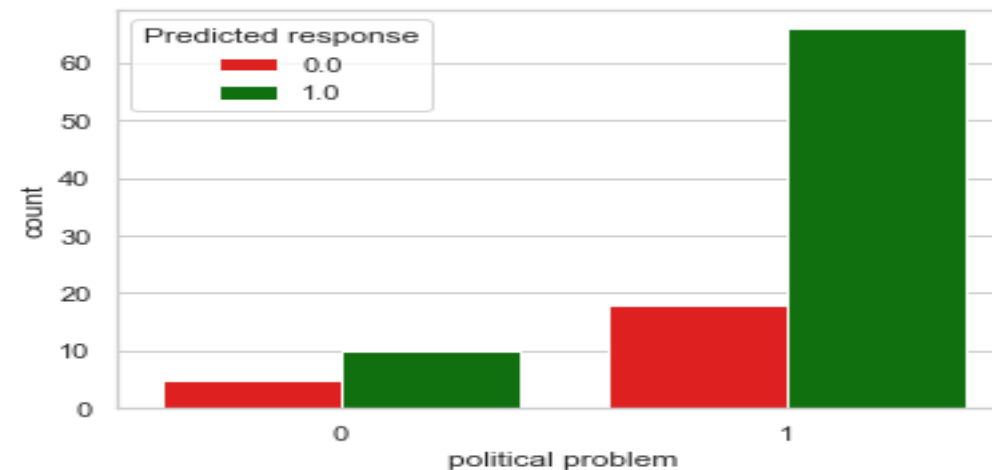
Fig-1.2: satisfied or dissatisfied on political problem and overall system

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Experimental Analysis(Con.)

Data analysis according to total dataset :
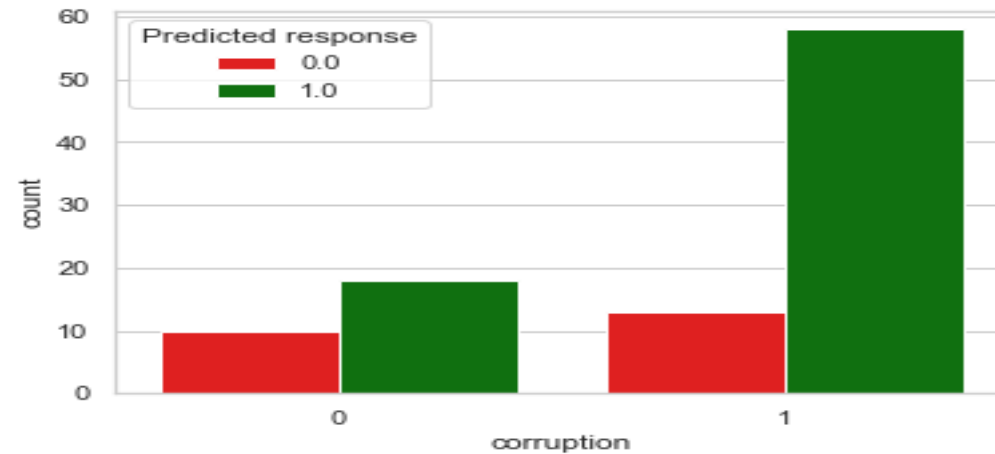
Fig-1.2: satisfied or dissatisfied on corruption and overall system

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Experimental Analysis(Con.)

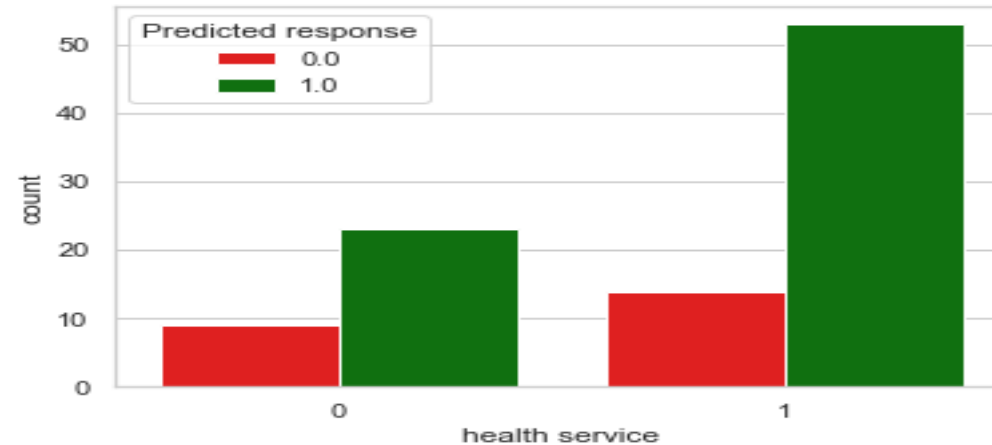**Data analysis according to total dataset :**

Fig-1.2: satisfied or dissatisfied with health service and overall system

Experimental Analysis(Con.)
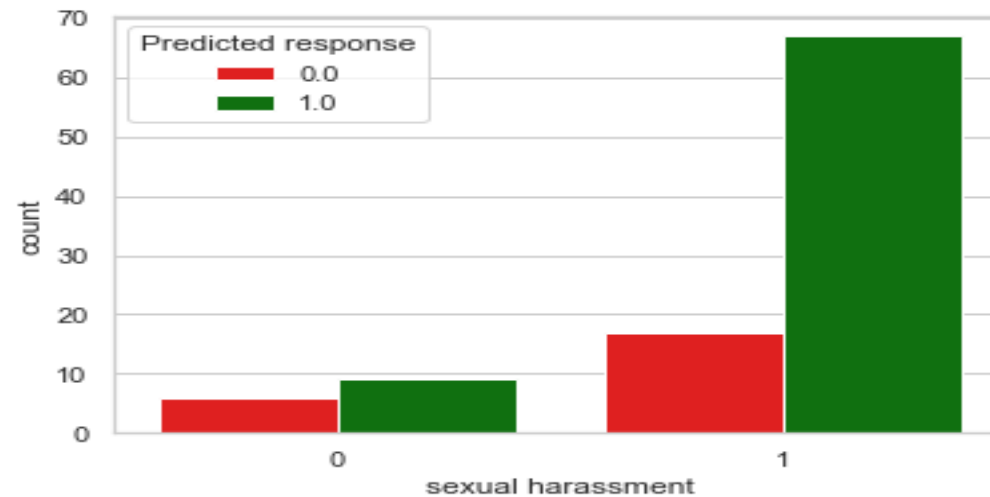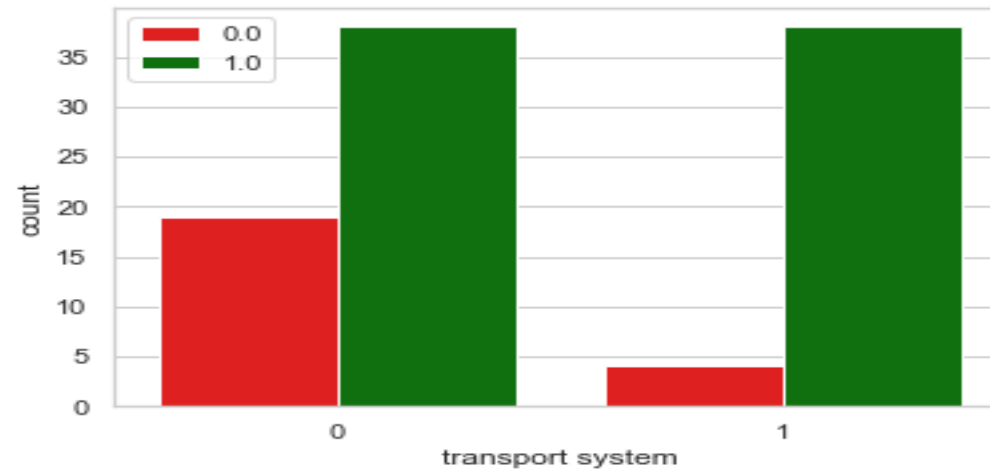
Data analysis according to total dataset :

Fig-1.2: satisfied or dissatisfied with sexual harassment and overall system

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Experimental Analysis(Con.)

Data analysis according to total dataset :

Fig-1.2: satisfied or dissatisfied on transport and overall system

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Experimental Analysis(Con.)

Data analysis according to total dataset :
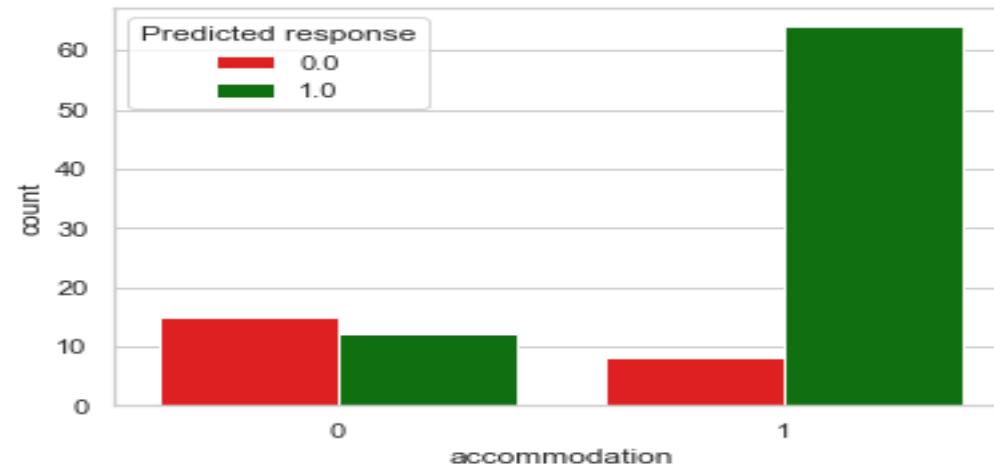
Fig-1.2: satisfied or dissatisfied on accommodation and overall system

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Future Works

1. We will collect data from different university's authority.

2. We will analysis international student's academic performance in Bangladesh.

3. We will try to extend our dataset.

Picture courtesy: http://www.sclance.com

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Contribution

1. Machine learning and Deep Learning techniques is very effective to classify and predict satisfied and dissatisfied students.

2. Our system will helps university authority to collect foreign students.

3. The more using of a large dataset will give better accuracy.

Picture courtesy: Humanergy.com

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Conclusion

International students are facing a lot of problems in Bangladesh. we have collected data from international students, those who are currently studying in Bangladesh . we have applied some popular machine learning algorithm to discover the problem. Among Five machine learning algorithm, SVM gives us high accuracy.

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1. Käser T, Hallinen NR, Schwartz DL " *Modeling exploration strategies to predict student performance within a learning environment and beyo*nd." 17th International conference on learning analytics and knowledge 2017, pp 31–40.

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

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DO YOU HAVE
ANY
QUESTIONS ?

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Thank you , everyone!