MODELLING THE EFFECT OF SOCIAL MEDIA ON FEMALE STUDENT USING ARTIFICIAL NEURAL NETWORK (ANN)

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis paper is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been submitted elsewhere for the requirement of any kind of degree, diploma or publication.

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ACCEPTANCE

This research report is submitted to the Department of Information & Communication Engineering, Noakhali Science & Technology University, Sonapur, Noakhali in partial fulfillment of the requirements for having the Bachelor of Science (B.Sc) degree in Information & Communication Engineering.

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Dedicated to my parents

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Lastly I also grateful to my family and classmates for giving me continuous support.

ABSTRACT

Social Media are growing rapidly among the young generation all over the world. The impact of social media (SM) in our education institutions and society today are undoubtedly overwhelming. Students in the developed and developing countries are becoming more addicted to social media and its applications for various reasons which will affect student specially female student's personal and professional life. This study aims to determine the impact of social media on female student's social lifestyle using Artificial Neural Network (ANN). The study deployed a quantitative research methodology involving questionnaire as research instrument among 100 female university students in Bangladesh. After training and testing the dataset we find that model accuracy is more than 90%.The findings include the following: social media refines how female students think, interact, communicate, fall in love (find love), positive and negative effects on them, their social lifestyle and many more. It was concluded that in despite of public views concerning the misuse of social media among female students in the society, some of the students were interested to use social media positively for their educations and other activities of their social life. But the negative impacts of social media among the undergraduates appeared to be higher as compared to positive impacts.

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Introduction

1.1 Background study

Artificial neural networks (ANN) are the pieces of a computing system designed to simulate the way the human brain evaluates and processes information. ANN has self-learning skills that enable them to produce better results. It is a soft-figuring tool that can learn patterns and guesses. Artificial Neural Network (ANN) is an area of extensive research.

Social media has exploded as a category of online discourse where people create content, share, bookmark and network at a high rate. Because of its ease of use, speed and reach, social media is fast changing the public discourse in society and setting trends and agendas in topics that range from the environment and politics to technology and the entertainment industry. Since social media has become popular platform among young students, we decided to find out social media effect on female students with the help of ANN which will predict the effect either positive or negative.

1.1.1 Different type of social media

Over the decades, there has been a huge change in the world of technology. Social media which means togetherness of individuals or organizations through some medium, for the purpose of sharing thoughts, interests, and activities being most utilized method of communication. It is mainly for carrying information has importance among students includes female students. About 100 million people began to engage with internet and social networking websites, by the start of 2000. Till now, more people visiting daily social media websites for socializing, interacting, online business, jobs, marketing, educational intention. The progressive turn in World Wide Web (WWW) has enhanced knowledge gathering, sharing and exchange of information. With the advanced technology, using social media by the help of smartphones, tablets, or personal

computer, many female students has up their sports in terms of using the social network wisely for achieving knowledge but many waste their time on chatting, recreation, uploading pictures, videos which are not advantageous for them.

There are various type of networking platforms like Facebook, Twitter, Instagram, Pinterest, YouTube, LinkedIn, Google+, Flickr, snapchat, vine, Tumblr, , MySpace, WhatsApp. Today, Facebook is the most popular social media website containing largest number of subscribers. Mark Zuckerberg opened Facebook in 2004. Then comes another famous social media Twitter which was created by Jack Dorset, Biz Stone, Noah Glass and Evan Williams. Twitter has more than 500 million subscribers. MySpace was the very first social networking website using which people could set up a profile and make friends that became inspiration for the next generation social media, including Facebook. LinkedIn is business and professional website. Flickr was one of the earliest amongst the most prominent photograph sharing social media websites. Besides Flickr, Photobucket and Instagram are among the top online social media to organize business cards and other media. [13]

The aim of social media is to give access to its clients and users. They can make conversation with peoples and create social bonding on the web. They can share their thought and individual information on social media including everyday events, presumptions, pictures, recordings and links. Individuals can promote their business and talent. The capacity of online networking to spread valuable data quickly has made it the quickest developing method of association. Social media networking has changed numerous businesses, however the most striking impact of it is in the classrooms and the overall education system. With such a high rate of students using social media networking on daily basis, there is a strong need to analyze the extent to which social media is having its impact on female students.

1.2 Artificial Intelligence (AI)

AI is an area of computer science that underlines the creation of intelligent machines that work and reacts like humans. Artificial intelligence is the replication of human intelligence processes by machines, especially computer systems. Artificial intelligence is like digital computer or computer-organized robot to perform tasks commonly related with intelligent beings. The span is commonly useful to the plan of developing systems capable with the intellectual processes

illustrative of humans. Computers can be involuntary to carry out very complex tasks as, for example, determining proofs for mathematical theorems or playing chess with great expertise.

1.2.1 Artificial Neural Network (ANN)

An artificial neural network (ANN) is a computational prototype based on the structure and functions of natural neural networks. ANN architecture is made up of communicating artificial neurons which are programmed like to simulate the properties of biological neurons. ANN is an information dispensation paradigm that is inspired by the way biological nervous systems, such as the brain, process data. Neural networks take a changed approach to problem solving than that of conventional computers. The key element of this standard is the novel structure of the information processing system. It is composed of a large number of highly interconnected processing elements (neurons) working in unanimity to solve specific problems. The human brain is composed of 10 billion nerve cells called neurons. They are connected to other thousand cells by axons. Stimulating from external atmosphere or inputs from sensory organs are accepted by dendrites. This input generates electric impulses which quickly travel through the neural network. A neuron can then send the message to other neuron to grip the issue or does not send it forward.

The axon is a better, cable-like projection which can extend tens, hundreds, or even tens of thousands of times the width of the soma in length. The axon carries nerve signals left from the soma and carries some types of information in the other direction also.

The dendrite is a splitting arbor of cellular extensions. Most neurons have several dendrites with profuse dendritic branches. The complete shape and structure of a neuron's dendrites is called its dendritic tree, and is traditionally thought to be the main information receiving network for the neuron. The soma, or 'cell body', is the central part of the cell, where the nucleus is located and where most protein synthesis occurs. The junctions that permit signal transmission between the axon and dendrites are called synapses.

1.2.2 Single layer network

The simple form of single layered network is shown in figure given below. The nodes on the left 1 to x_0 are called input layer. The input layer neurons are to only pass and distribute the inputs and perform no computation. Thus, the only true layer of neurons is the one on the right. Each of the inputs is connected to every artificial neuron in the output layer through the connecting weight labeled as w_0 to w_n. Since every value of outputs is calculated from the same set of input values, each output is varied based on the connecting weights.

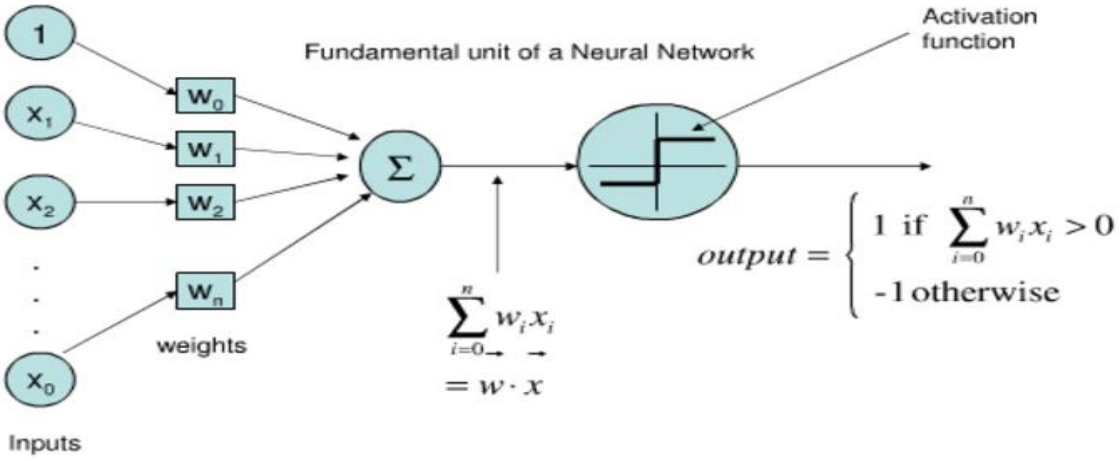


Figure 1.3 Architecture of single layer neural network

1.2.3 Multi-layer network

To achieve higher level of computational abilities, a more complex structure of neural network is mandatory. Figure shows the multilayer neural network which discriminates itself from the single-layer network by having one or more hidden layers.

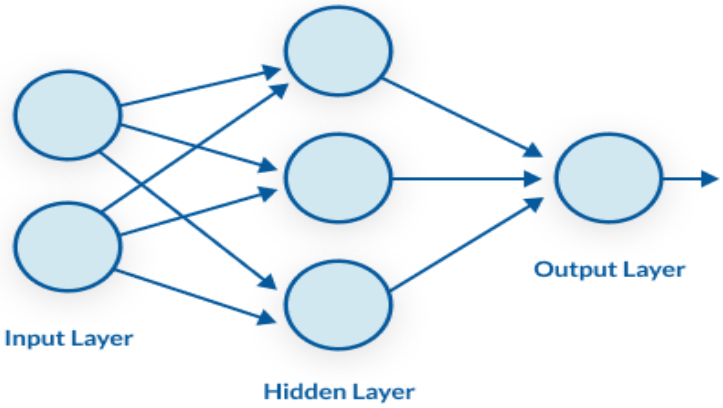


Figure 1.4 Architecture of multi-layer neural network

In this multilayer structure, the input nodes pass the information to the units in the first hidden layer, and then the outputs from the first hidden layer are passed to the next layer, and so on. Multilayer network can be also viewed as cascading of groups of single-layer networks. The level of complexity in computing can be seen by the fact that many single-layer networks are combined into this multilayer network. The designer of an artificial neural network should consider how many hidden layers are required, depending on complexity in desired computation.

1.3 Problem statement

Many studies has been carried out on students usage of social media, its impact on their social behavior, education, academic performance as well as the positive and negative impact, the factors that influence the usage, ethical usage and many more.[2] [3] While a study covered social media effect on academic advancement and social wellbeing of adolescents. [4]

As social media application has become most popular among young students, many research conducted on youth but with female student these type of study is limited in Bangladesh. In this research paper, Artificial Neural Network has been applied to predict the effect of social networking media on female students. Multilayer perceptron with one or more than one hidden layer has also be checked to measure the performance of the overall network. So, by analysis data which will be collected with the help of survey from female students of different universities we can find out how social media effect female social lifestyle, how female students interact, behave,

how much they dependent on social media, effected by others lifestyle, benefited or waste their time.

1.4 Objective of this thesis

In this research work, apply of multilayer perceptron neural network with regression and classification helps to know effect of social media more accurately.

The main objectives of this research are as follows:

1) To predict positive or negative effect of social media on female student.
2) To study the performance of the effects using multilayer perceptron neural network.
3) To make a comparison on the basis of classifying result.
4) To analysis how female student's lifestyle are affected by using social media.

1.5 Scope

This research aims to analyze how social media impact on social lifestyle and predict the social site's effect on university level female students whom age are between 20 to 27 years. All of them are Bangladeshi female social media user. We create a google form with several questions. Then by sharing this form through Facebook we collect data from female students studying in different universities. Our sample size is 100. It has taken around 10 to 15 days to collect their data.

Chapter 2

Related Research

Social media is becoming part of our society, changing social norms and culture. [2] Here, different related works are described in short. All the required and related factors within this data analysis process are noted here. The followings are discussed, different types of existing research works.

2.1 Social media impact on social lifestyle

Students uses social media across different departments including nursing, information systems and many others. Also for various reasons like communicating with friends, access to learning contents and sharing, group discussion forum, chat room, wiki, fun and many more. [2] At this point, the usage of social media among university students can bring positive and negative impacts. Al-Sharq stated that SM create a new innovative mindset on students as well as improving inter-social interaction and relationship between students and educators.[2] This new media can be addictive, time consuming, distractive, social gathering isolation, monophobia and others.

Also, Mingle and Adams suggested that the usage of SM negatively cause bad hand writing and spelling, lateness to class and assignment submission, addiction, few study time and others. These negative effects can be visualized on social lifestyle or cultural belief system changes. They asserted that SM changes educational settings and learners behavior. [4] The platform exposes students to post unethical contents and views. [6]The extent of changes from SM is one of the most innovation of the 21st century. But SM can cause harm/s to the user. [7]

2.2 Female students and social media

Undoubtedly, the usage of social media has affected social and human feelings. These feelings can results to pain, hurt, mental and emotional breakdown, crisis in marriage and many more. [8] Williams argued that ineffective usage of Facebook by couples can lead to relationships collapse. The researcher further stated that SM influence user's culture and belief system, values, religion, pop culture, politics and many more. Altogether, SM can be said to be widely used by female students than male fellows for various reasons and activities.

2.3 Social media impact on female students

Social media, if utilized wisely can serve as a good avenue for collaborative learning for students. [9] Gross stated that the use of social media has spiked so high over the past decades which has increased lots of expectations such as; a) the prediction of social media use by gender as boys appear to spend most of their time browsing the internet while girls engage in chatting, b) that the use of social media leads to adolescent depression and isolation, c) that adolescents uses social media for diverse unknown things. [10] SM applications can be assessed from devices like computer and at anywhere any time for the purpose of connecting friends and well-wishers, interacting and sharing personal ideas. Also the use of social media by students can cause problems of self-esteem, depression and sleeplessness.

With the improvement in technology, research has proven that social media plays a huge role in the economy growth, uniting of friends and allow making of new friends. While it consequences includes; terrorist attack, cyber bullying, poaching for sexual exploitation and time wasting. [11] Also, research reported that the use of social media has led to series of female violence through arranged meetings with social media male friends.

2.4 Neural Network

Different neural network architectures were used based on the supervised training method, in which the value of the target variables are known [15-16]. This training method was based on the principles of the back propagation algorithm, which is the generalization of the learning rule of Widrow-Hoff for networks with multiple layers and nonlinear differentiable transfer functions [17].

The back propagation network normally has three layers: an input layer, one or more hidden layers, and an output layer, each including one or more neurons[18]. The topology of the networks used in each node from one layer is connected to all nodes in the following layer, but neither lateral connections within any layer, nor feed-back connections are used[19-20].

The weights and biases should be initialized before training, normally these values are random numbers, the result network should be independent of the initialization, this indicate the ability generalization of the network[21]. The network architectures were train using two different set of initial values for weights and biases[19].

Many algorithms can be used for the training of the network [22] most of these are based on optimization techniques[18].

The validation model was based on the methodology described by Dececker et al. (2002), which consists in splitting the data set into tenfolds. Each tenfold is used for validation while the others are used for training. This procedure is repeated until all tenfolds are used for validation [20] A network with two neurons and activation function tangsig-tangsig presented the largest correlation coefficient (r=0.825) and percentage of success (92.54%)[15].

In this study a fully connected network structure was implemented under the scheme of realtime recurrent learning (Williams and Zipser,1989). This real-time recurrent network (RTRN) has been characterized as containing hidden neurons and allowing arbitrary dynamics, in comparison with other recurrent networks such as the Hopfield network [20].

Chapter 3

Methodology

This section will explain the research methodology used for the research under study. The overall design or strategy that helps in obtaining the desired goals and objectives of the research is referred as research methodology. The aim of this research paper is to predict the effect of social media effect on female. Artificial neural networks based on multilayer perceptron with varied number of outputs have applied to determine the impact of social networking site. For this at first the data set needs to be converted into a dataset which defines the array form of our data. After that, the dataset needs data preprocessing using the scaling function. Hidden layers with several number of outputs are added to achieve the accuracy. After compiling the model, evaluation is made for the prediction and accuracy.

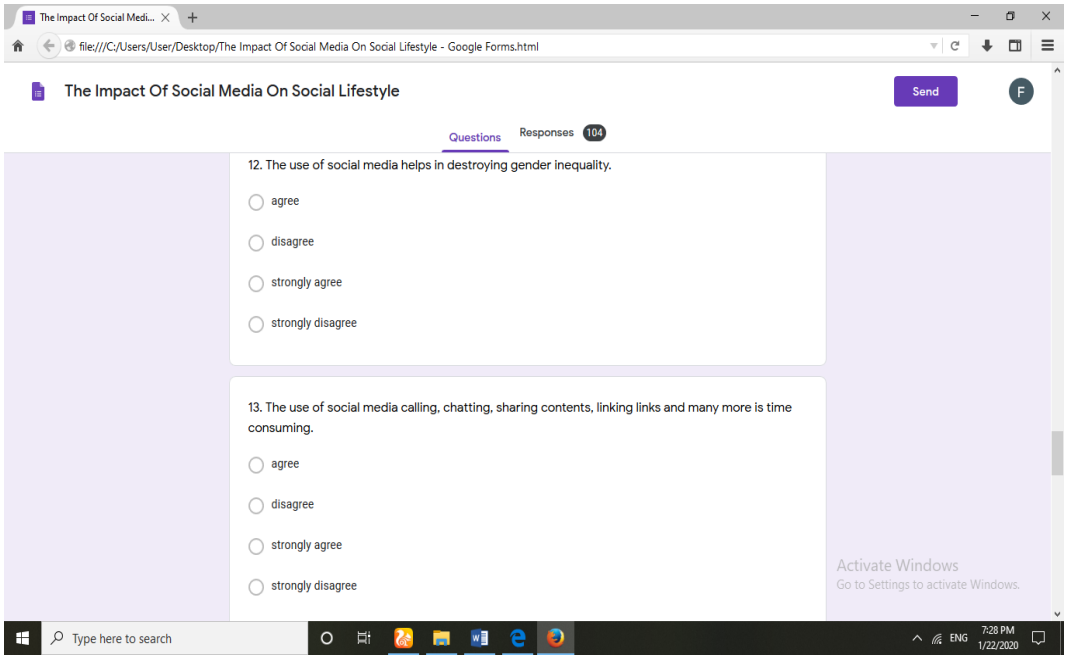
3.1 Data collection

Data collection is an important step while conducting research. In this research, qualitative data is involved. The preferences of students to use social media, belong to qualitative data. In this study, primary data for this research study was collected using a questionnaire; the data of questionnaire was collected from 100 participants from different universities. It takes 10 to 15 days to collect data. These data lead this research study to the investigation of the impact of social networking websites on female student's social lifestyle. Here, in this survey we asked participants some question about their preferences, perspective, activities, thoughts, liking, disliking about social media in Bangladesh.

3.1.1 Data collection form

Our survey questions based on some questions –

1. Which of the following is your preferred social media application?
2. Does social media usage promote good societal norms and values?
3. Does the posting of irrelevant, racist, abusive, anti-cultural and religious contents and links promotes hatred among racial groups in the society?
4. Does the use of social media by female students dis value marriage institution in the society?
5. Social media is good for today's education learning.
6. The use of social media is negatively affecting personal interaction.
7. The use of social media promotes immortal and unethical posting of pictures, videos, images among female students.
8. The use of social media impact on female students positively.
9. Has the use of social media destroyed your social values and lifestyle?
10. Does the use of social media promote borrowing of foreign culture and traditions?
11. The use of social media helps in destroying gender inequality.
12. The use of social media calling, chatting, sharing contents, linking links and many more is time consuming.
13. The use of social media has destroyed your relationship with family/friends/course-mates?
14. The use of social media is becoming addictive to female students.
15. The use of social media encourages female students to involve in politics.
16. Do you think social media is latest means for you to find love?
17. Others status, lifestyle, fashion, body image effect you.



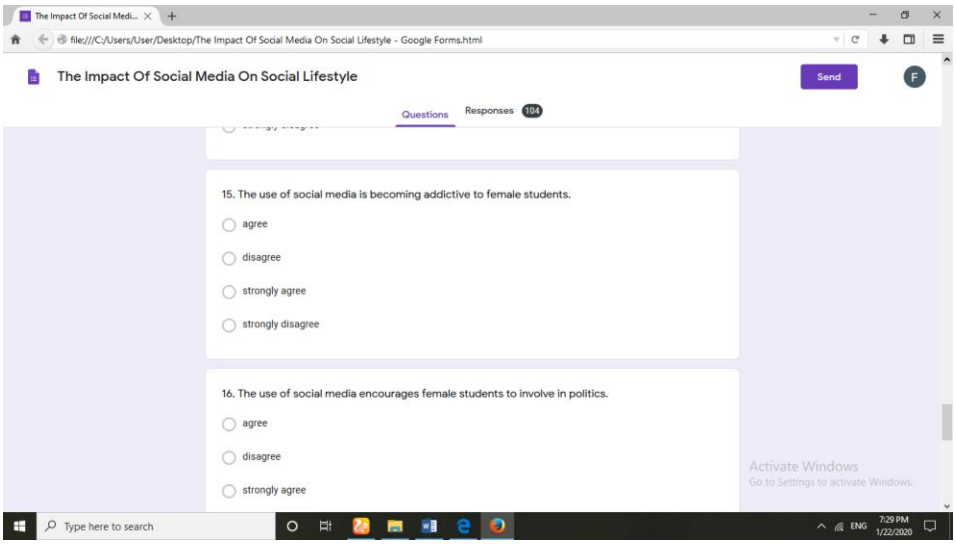


Fig 3.1: Screenshot of data collection form (partial form)

3.1.2 Input data format

The screen-shot of data collection form is given below…

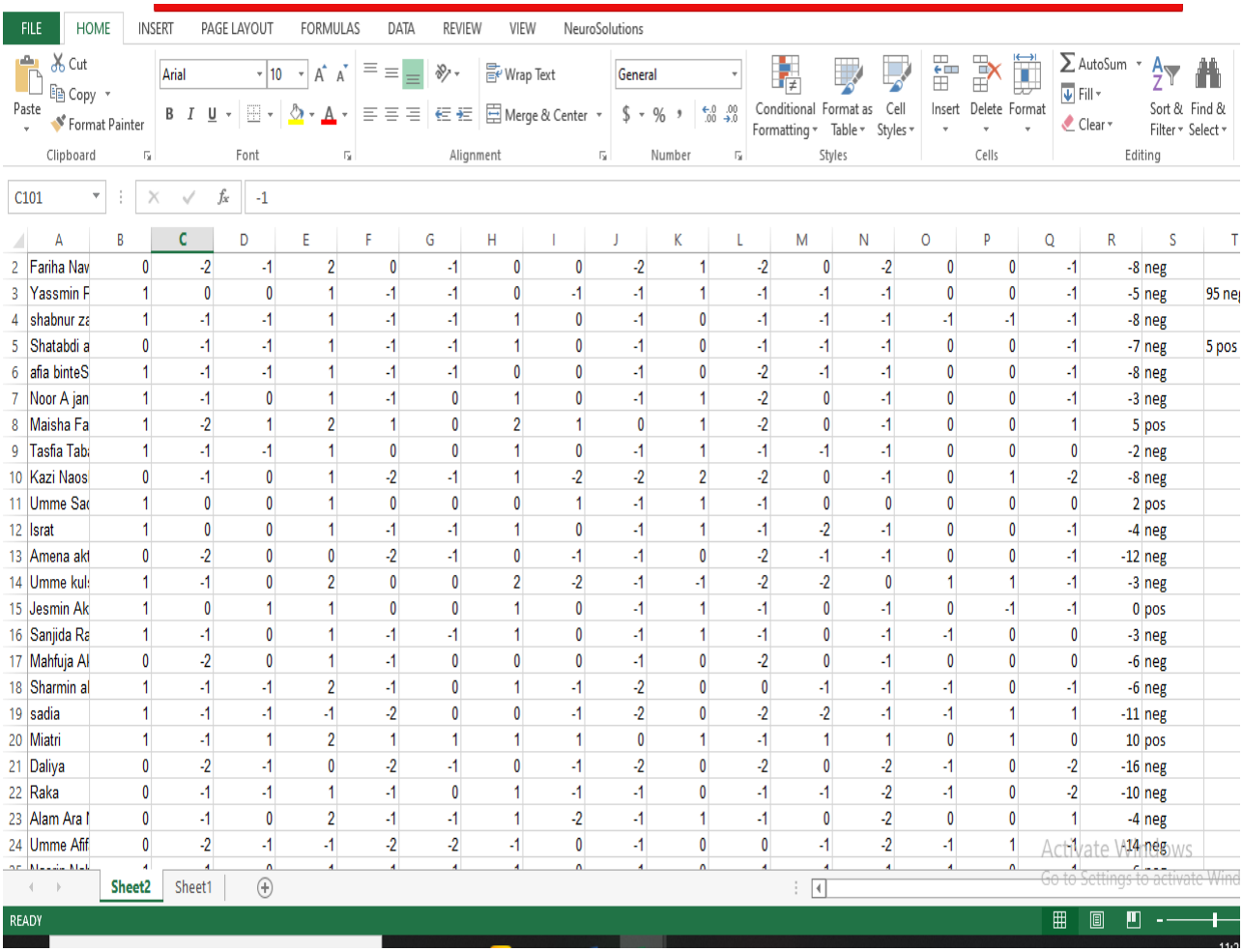


Fig 3.2: Screen shot of input data format

3.2 Methods

The modeling accuracy largely depends on the selection and processing of the data and their internal procedures. The method describes the overall process of the system that are required for the neural network building process. Every artificial neural network building procedure needs a clear and authentic steps which can help further to evaluate the model accurately. The model accuracy largely depends on the selection of the neural network and comparing their outcomes for the future outcomes. The comparison will help to determine the best model suited for our dataset. A quite good model solves the real world problem after the processing. Artificial neural network and their internal procedure helps in this prediction and guesses of the upcoming outcomes. So, selection of neural network is important for building an accurate neural network for prediction and accuracy.

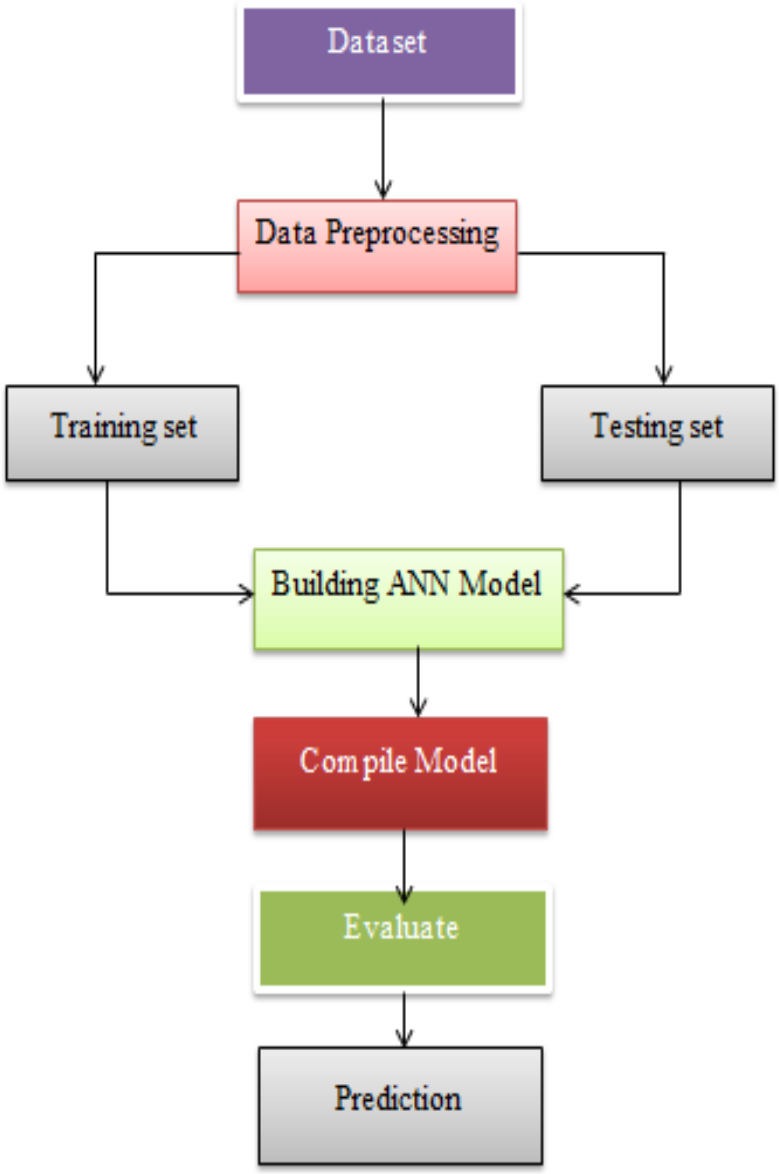


Fig 3.3: Block diagram of the overall method

3.2.1 Data Preprocessing:

Preprocessing of data involve working on raw data inputs to generate a single input to a net, while normalization is a transformation performed on a single data input to distribute the data evenly and scale it into an acceptable range for the network. Preprocessing of data is

essential. Neural networks often behave unwell when the feature values much larger than parameter values. Furthermore, since an observation's feature values are combined as they pass through individual units, it is vital that all features have the same scale.

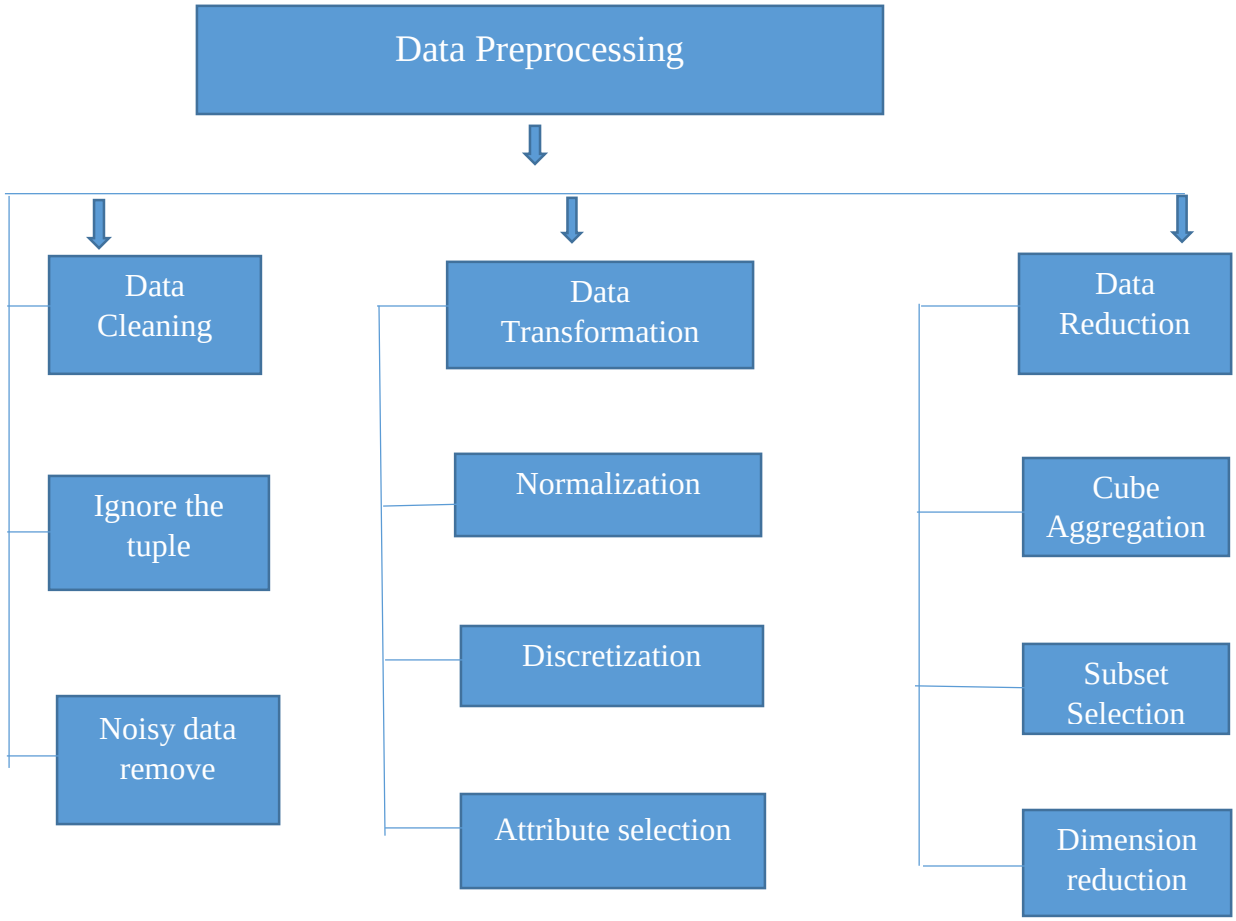


Fig 3.4: Block diagram of data preprocessing

Min-Max-Scale**:** Min max scaling has been applied to our dataset for the scaling purpose. It scales the dataset into a specific range. Most of the time the range is between 0 to 1(also1 to -1) is possible to set the data preprocessing. Before training, testing and validating data set by the neural networks, the normalization of the data set is needed. Normalization is the process of organizing a database

to reduce redundancy. Normalization (or scaling) is one of the main parts of ANN learning process because real data obtained from experiments and analysis most times are distant from each other. If data is not normalized, the importance of each inputs between (0,1) or (-1,1) are not equally distributed by thus naturally large values become dominant according to less values during ANN training. The effect is great because the common activation functions such as sigmoid, hyperbolic tangent and Gaussian produce result that ranges between [0,1] or [-1,1]. It is important to normalize the values to be in that range. Moreover the dissimilar range of the inputs can distort the neural network result.

The common normalization approach includes statistical normalization (using mean and standard deviation) and Min-Max Normalization. Therefore, the experimental data are normalized according to equation in order to train the neural network effectively. Normalization confirms that the neural network was trained effectively without any particular variable significantly distorting the result.

$$X_N = 2\,\frac{x - x_{min}}{x_{max} - x_{min}} - 1 \qquad (1)$$

Where, X_N is the normalized value of the real variable, x is the measured value of the variable

And x_{min} is the minimum value of the real variable; x_{max} is the maximum value of the real variable.

3.2.2 Learning rate and Activation Function

Learning rule or learning procedure is a method or a mathematical logic which improves the artificial neural network performance. Generally this rule is applied repeatedly over the network. It is done by updating the weights and bias levels of a network when a network is simulated in a specific data environment. A learning rule may accept existing condition (weights and bias) of the network and will compare the expected result and actual result of the network to give new and improved values for weights and bias. The learning rule is one of the factors which decides how fast or how accurate the artificial network can be developed.

A bias value allows to shift the activation function to the left or right**,** which may be critical for successful learning. Bias is much like the weight except that it has a constant input +1.

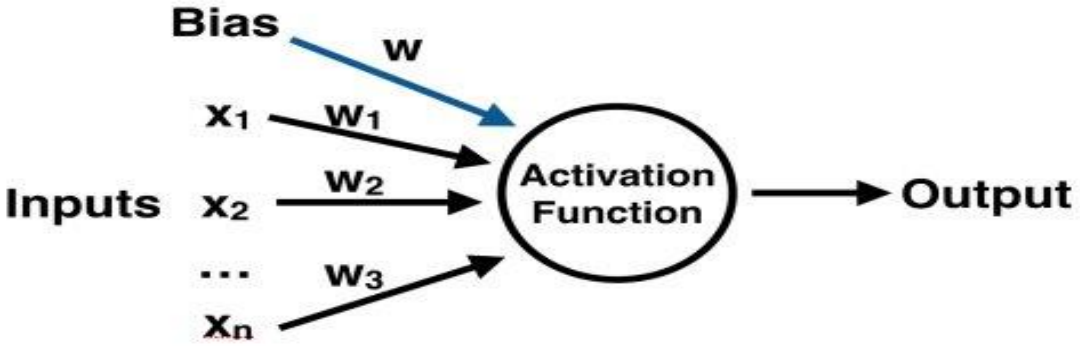


Figure 3.5 Bias Neuron

Activation function, in computational networks, the activation function of a node defines the output of that node given an input or set of inputs. In artificial neural networks, this function is also called the transfer function. In most cases a non-linear activation function is used in order to achieve the advantage of multilayer nets compared with the limited capabilities of single layer nets non-linear function required. Sigmoid function or S-shaped curve is useful activation function. There are two types of sigmoid function.

1. Binary sigmoid, which has a range of (0, 1)

   $f(x) = \frac{1}{1+e^{-x}}$ (2)

2. Bipolar sigmoid, which has a range of (-1, 1)

   $f(\frac{x}{2}) = \frac{1-e^{-x}}{1+e^{-x}}$ (3)

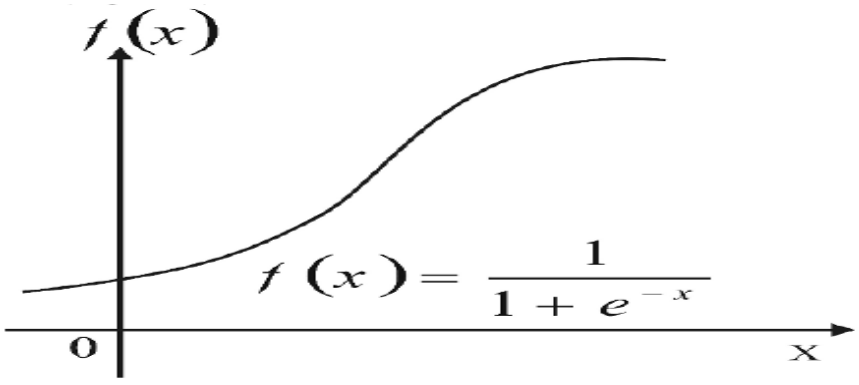


Figure 3.6 Activation function

Learning rate, α controls how radically weights are altered. The learning rate is used to control the amount of adjustment at each step of training.

Epoch is a measure of the number of times all of the training vectors are used once to update the weights. For batch training all of the training samples pass through the learning algorithm simultaneously in one epoch before weights are updated

3.3 Training and Testing Data

Training set is the one on which we train and fit our model mostly to fit the parameters whereas test data is used only to evaluate performance of model. Training data's output is presented to model whereas testing data is the hidden data for which predictions have to be made. In our research, training and testing dataset has been taken in different scale. Mostly 67% of the training dataset and 33% testing dataset evaluate the accurate result for the modeling process. Training and testing data are plotted against the epochs and that graph shows the total review of the neural network.

Validation data

Data validation is the process of ensuring data have undergone data cleansing to ensure they have data quality, that is, that they are both correct and useful. It uses routines, often called validation rules that check for correctness meaningfulness and security of data that are input to the system. The rules may be implemented through the automated facilities of a data dictionary or by the inclusion of explicit application program validation logic. The study of detecting the presence or absence used half of total dataset for the testing approach

3.4 Training the multilayer perceptron neural network:

The multilayer perceptron (MPL) is one of the most common neural network architecture and has been used successfully in various applications. Multilayer perceptron (MLP) are layered feed-forward networks typically trained with static back-propagation. These networks have found their way into countless applications requiring static pattern classification. Their main advantage is that they are easy to use, and that they can approximate any input/output map.

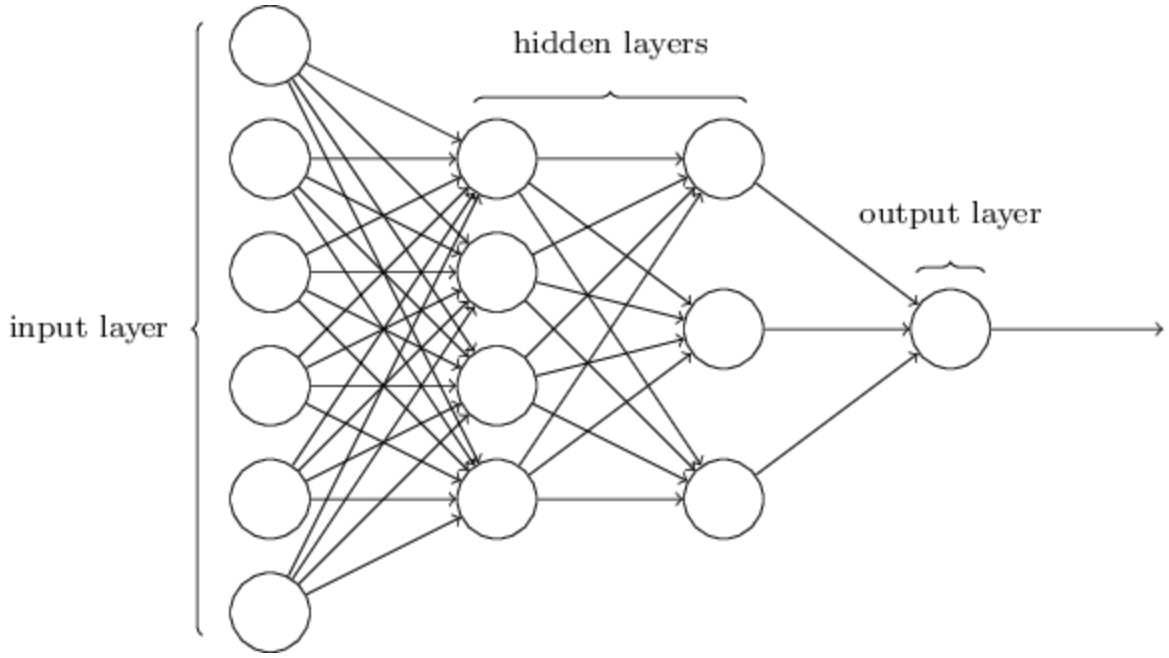


Fig 3.7: multilayer perceptron with single output

The multilayer perceptron uses back-propagation method. Back-propagation is simply a generalization of the least mean squares algorithm in linear perceptron. This is a supervised learning technique where learning occurs by changing connection weights after data is processed. Data processing is done based on the amount of errors in the output compared to the expected results. In Figure 3.6 shows a MLP neural network with two hidden layer is shown.

The configuration of the MLP for detecting presence or absence in this study composes of two hidden layer with 32 neurons and the epoch number of the network is 1,000.

the net_input of hidden layer and net_input of output layer equation is given below.

$$(\text{net\_input})_{\text{hidden}} = \sum_{i=1}^{10} w_{i,j} x_i + b_j \quad (4)$$

$$(\text{net\_input})_{\text{output}} = \sum_{j=1}^{7} w_{j,o} h_j + b_o \quad (5)$$

Where $w_{i,j}$ and $w_{j,o}$ is the weight between the input neurons and hidden neurons and hidden neuron and output neuron, x_i is the value of the input, h_j is the value of the output of the hidden nodes, b_i is the input node bias and b_o is the output node bias.

As equation (2) the output of hidden layer and output layer is given below.

$$y_{hidden} = f([(net\_input)_{hidden}]) \quad (6)$$

Where f is the transfer function and y is the neural network predicted output

3.5 Error

Based on the training testing process on the data set, networks will predict the target value or classify the species occurrence. But the prediction of this network may contain error. The error is computed with the equation

$$Error = E = \frac{1}{2}(t_T - y_o)^2 \quad (7)$$

Where,

t_T = target value, y_o = the neural network output, E = error

The actual error of the network is calculated by running all the training cases and testing cases. The performance measure parameters of all networks are mean square error (MSE) and the r value of the networks output. Mean square error (MSE) one of the most common measures used to forecast the accuracy of the networks. The concept of mean squared error is an important criterion that is utilized in order to measure the performance of an estimator. The mean squared error, abbreviated as MSE, is quite important for relaying the concepts of precision, bias and accuracy during the statistical estimation.

3.5.1. Mean Square Error (MSE)

The measure of mean squared error requires a target of prediction or estimation along with a predictor or estimator which is said to be the function of the given data. MSE is defined as the average square of the errors.

$$MSE = 1/N \sum_{o=1}^{N}(t_T - y_o)^2 \quad (8)$$

$$RMSE = \sqrt{1/N \sum_{o=1}^{N}(t_T - y_o)^2} \quad (9)$$

Where, N is the total number of training pattern.

3.5.2 Linear Correlation Coefficient (r):

R value, the coefficient of correlation or determination are used to measure the correlation between actual and predicted value. It measures the direction and strength of the linear relationship between actual and predicted value. The r value is always between -1and +1.The highest value of r is 1.

The r value is a measure of how well the variation in the output is explained by the target. There is perfect correlation between target and output when this value is equal to 1. A positive r indicates a positive relationship and a negative r indicates a negative relationship.

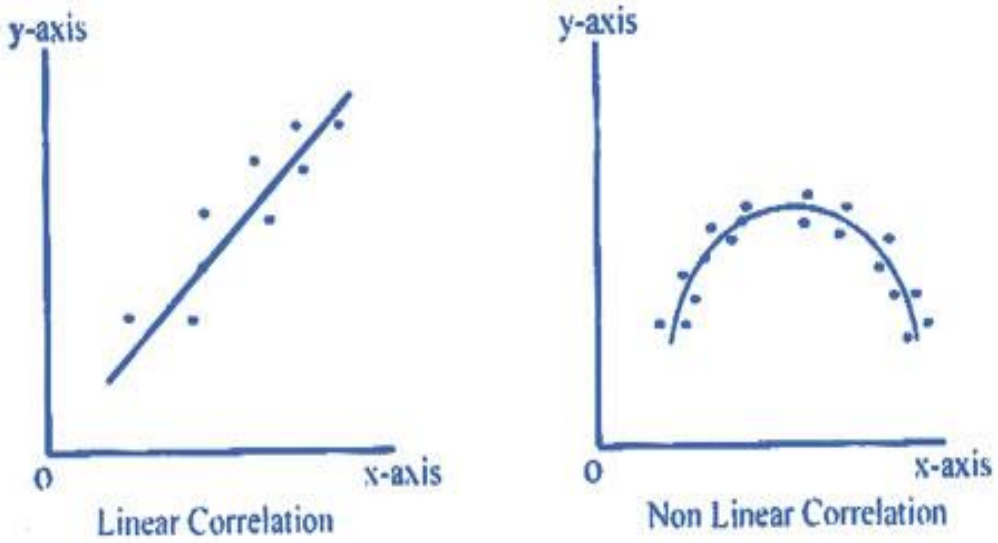


Fig 3.8: correlation (Linear and Non-Linear)

Chapter 4

Result and Discussion

In this study, an approach is made to predict the effect of social media on female student. The multilayer perceptron artificial neural network provides the way to predict the outcomes. In this training and testing process, 67% data are used for training and 33% data are used for testing.

4.1 Neural Network Model for social media effect

4.1.1 Training, Testing and Validation Result:

After modeling with multilayer perceptron the model accuracy becomes up to the 92% of the actual data. The MSE (mean squared error) has decreased after each epoch. It has been seen that the mean squared error of the training and testing data are decreased with the increasing number of the epochs. Each iteration take the model towards the accuracy. In this training and testing process, 67% data are used for training and 33% data are used for testing. In terms of artificial neural networks, an epoch refers to one cycle through the full training dataset. Usually, training a neural network takes more than a few epochs. MSE is a network performance function. It measures the network's performance according to the mean of squared errors.

In figure 4.1, when epoch is 100 then mean squared error is 0.067 but with the increment of epoch number like when epoch is 500 then we can see in the graph that mean squared error rate decreases in 0.038.

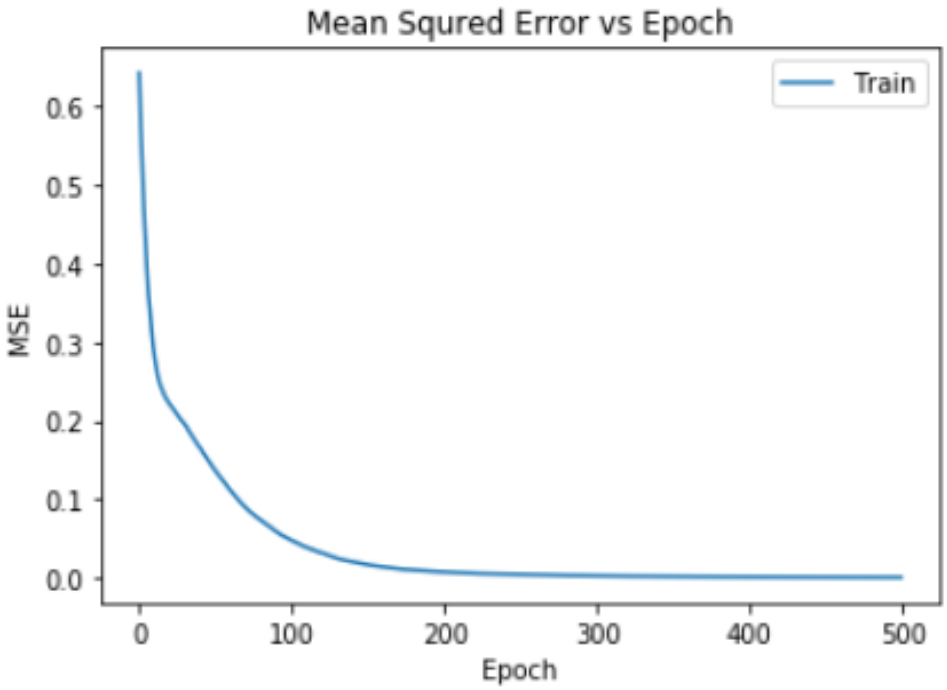


Figure 4.1 MSE with respect to number of epoch (500) of MLP network.

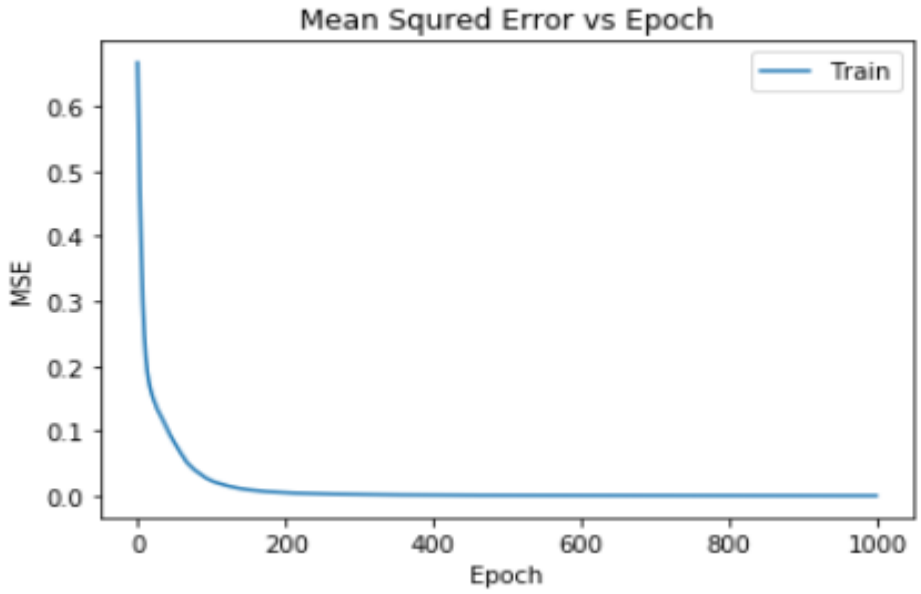


Figure 4.2: MSE with respect to number of epoch (1000) of MLP network.

If we increase the epoch again and again for example in fig 4.2, mean squared error decreased. With 600, 800 at last in 1000 number epoch error decremented in 0.0299. It is clearly understand that, the mean squared error of this model is gradually decreasing after the increasing number of the epochs. The gradually decreasing mean squared error has made the model more accurate and the model accuracy is up to the 90% after 1000 epochs. The epochs are the iteration that are made in every instances when the neural network is building.

Predictions: [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

Outcomes: [0 0 0 0 0 0 0 0 0 0 0 0 0 0]

4.1.2 Correlation with different attributes

A correlation Heat map can be customized to improve its readability. A Heat map is a gra phical representation of data where the individual values contained in a matrix are presented as colors.

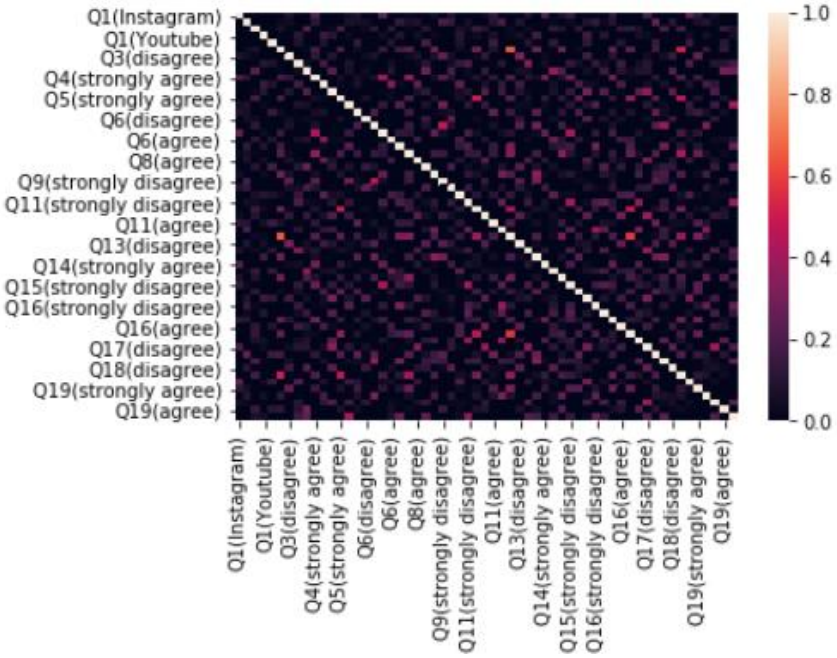


Fig 4.3: Correlation Visualizing using Heat map

4.2 Graphical Representation

4.2.1 Social media effect

On basis of our survey questions 100 female students responded. By analyzing numerical data set we find out that most of the female students have negative effect of social media networking sites on them. Few of them believed that there is positive effect of social media.

Figure 4.4: Pie chart of social media effect

Here from above chart we see that almost 90-95% percent students think social media has negative impact on female in society. If we discuss some questions it will be cleared how negative effects come through social media. From survey we found most of the female use Facebook as their preferred social media. Besides it, WhatsApp, You Tube, Instagram are used. So, using these media female students waste large part of their time by chatting, calling, sharing posts. Sometimes,

they share such type of contents like racist, abusive, anti-cultural, irrelevant content which divide them in various opinion and creates hatred among them. Social media promotes immortal and unethical posting of pictures, videos, contents which create a bad impact on them. Their interaction with people are negatively affected. Sometimes, they try to find love through social media which may be not effective for them. Their relationship with family or friends becoming fade as they give most of the time to social media sites. As female students are being addicted to social media foreign cultures grasped them and following these their attitude, behavior, styles are changing which is threat to our Bangladeshi culture. Moreover, watching other people in social media they try to follow other's fashion, style, social lifestyle. There are some female who become depressed with other female body image.

There are also positive effect like social media is good for today's education, communication. Social media promotes good societal norms, values.

4.2.2 Visualization of how much effect on each question

With 16 questions we analyzed data. So on which questions social media's effect are much or little, can be determined by this visualization. In figure 4.5, social media's effect on basis of each question are plotted in range of -3 to 3. It is density graph which contains density of each questions effect on female students. From the graph we can visualize easily that question 12 and 14 have highest peak value then questions 4 has less peak value than question 12 and 14. Question 12 is 'does the use of social media promote borrowing of foreign culture and traditions?' Question of 14 is 'The use of social media like calling, chatting, sharing contents, linking links and many more are time consuming'. So we can understand that these two questions effect on female students are more which is negative. Question 4 is posting irrelevant, racist, anti-cultural, abusive content create hatred among racial groups in society. This questions has also more effect density which create negative impact on society.

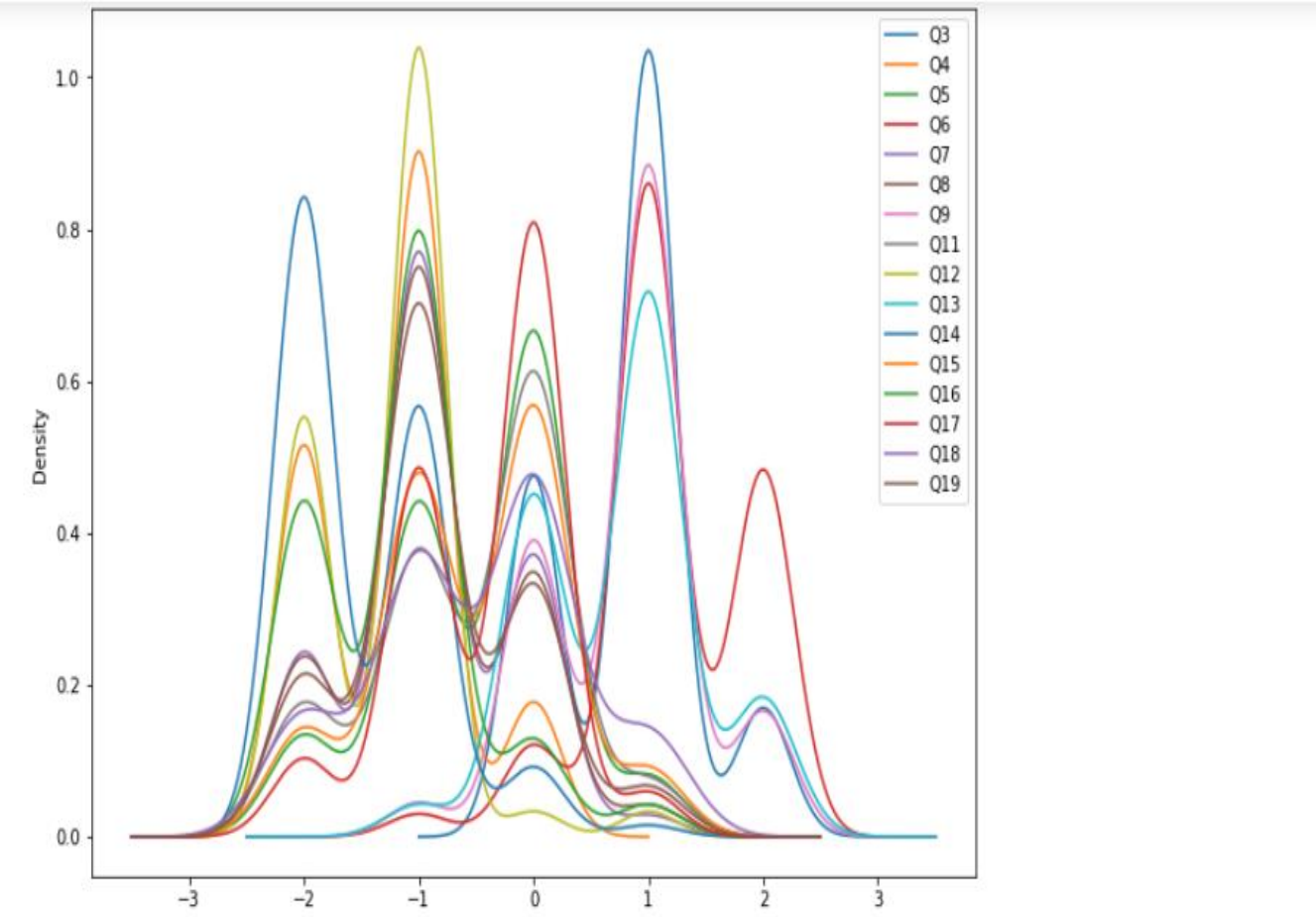


Figure 4.5: Social media effect's density graph

4.2.3 Positive and negative effect

In this section our results, positive and negative effect will be visualized for each question. Which question has positive and negative effect and the value of positivity and negativity are shown here and discussed broadly with the help of chart and table.

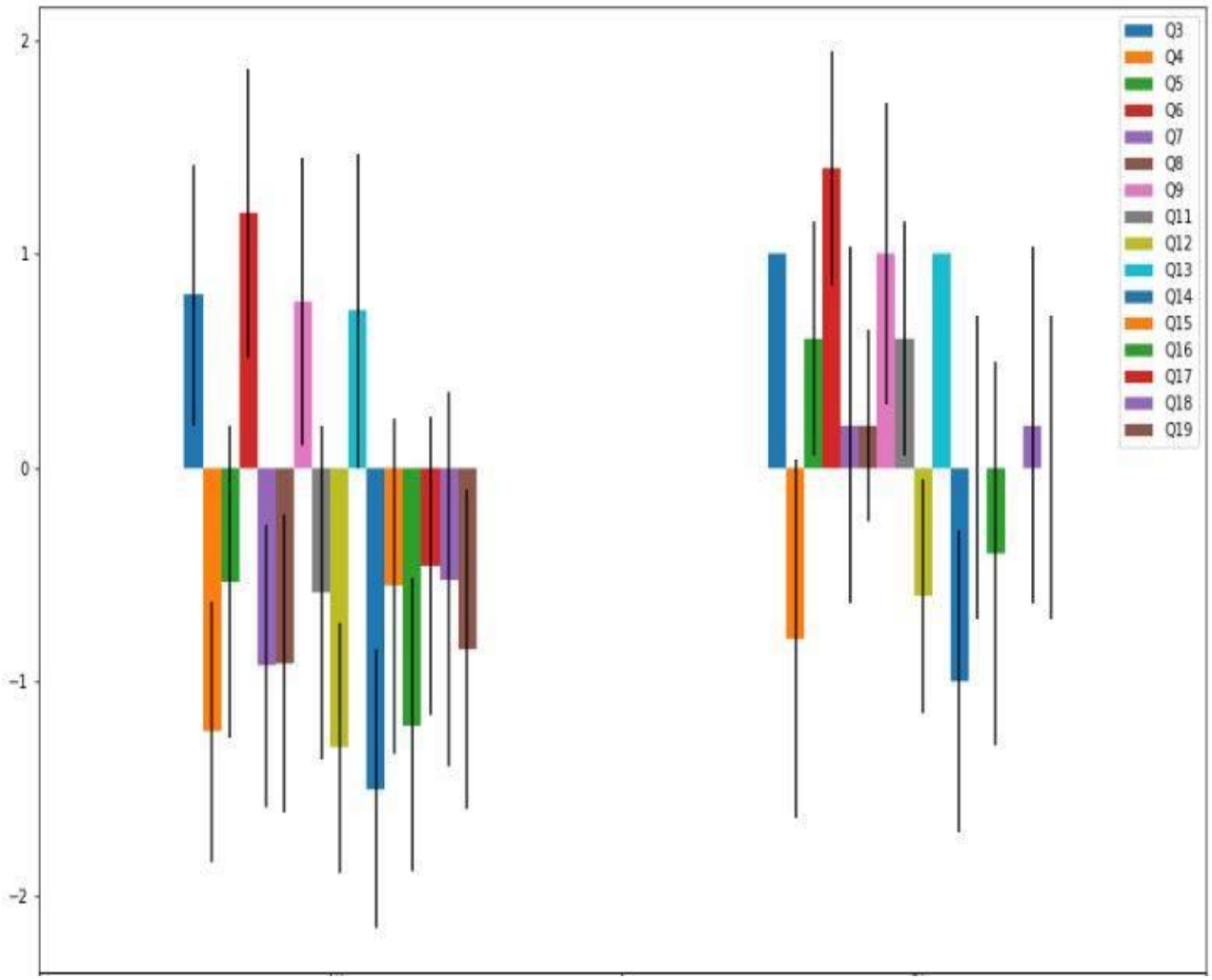


Figure 4.6: Positive and negative effect

In the above figure on left hand side negative effects are shown and on the right hand side positive effect are shown. For both effect we can see that positive and negative value remains. Here for negative effect 4 values are positive and for positive effect 4 values are negative.

Table 4.1 Positive and negative effect value

Questions name	Negative label	Positive label
Q3	0.808	1
Q4	-1.234	-0.8
Q5	-0.5319	0.6
Q6	1.191	1.4
Q7	-0.925	0.2
Q8	-0.914	0.2
Q9	0.776	1
Q11	-0.585	0.6
Q12	-1.308	-0.6
Q13	0.734	1
Q14	-1.5	-1
Q15	-0.553	0
Q16	-1.202	-0.4
Q17	-0.457	0
Q18	-0.5212	0.2
Q19	-0.8510	0

From above table we can see for each questions there are both positive and negative effect. But in some questions positive effects much, negative effect less. Some questions has more negative effects and less positive effects.

Below for understanding more easily and visualize effect of social media, positive and negative effect are shown with box chart where effects are shown in shape of box in graph.

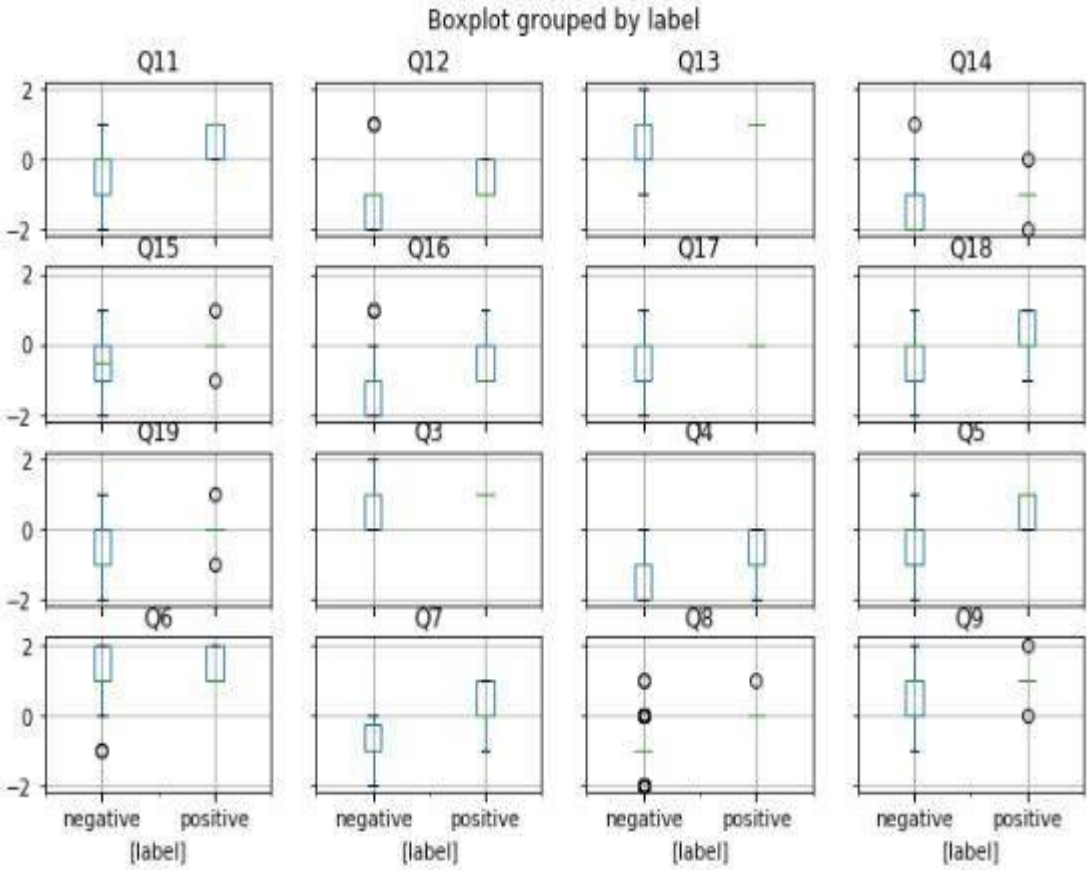


Figure 4.7: Boxplot of positive and negative effect

4.3 Discussion

The multilayer perceptron neural network has been tested for 15ttal 84 data individually. After the test, there are result of the lowest min squared error. There is also addition of the correlation among questions. The effects of the social media on basis of each question are tested accordingly to see their inter relationship. The relationship gives the idea about the density of the positive or negative effect. It has shown quite good satisfactory result and accuracy with the applied neural network.

4.4 Research findings

Positive impact of social media on female

- To a larger percentage, social media promotes good and healthy societal norms and values which prove a positive sign in our society.
- Female students have a good attitude and perception on SM as it is a way to teaching and learning (education) in our society today.
- Social media helps in destroying gender inequality.
- The usage of social media by females has less destroyed they relationship with family, friends and course-mates.

Negative impact of social media

- Female student's attitude and perception proves that social media is negatively affecting personal interaction and social lifestyle in the society.
- The finding also proves that female students believed that social media promotes immoral and unethical posting of videos, pictures and images among students. The posting sometimes leads to a display of personal/private contents and pictures online for the public to see.
- Social media promotes borrowing of foreign culture and traditions.
- The use of SM features (calling, chatting, sharing contents, linking links and many more) consumes female student's time.
- The use of social media is an addiction for female students.

Chapter 5

Conclusion

5.1 Conclusion

Previously, the conveying and free sharing of information among individuals were confined by long distances and lack of facilities. The new universe of social media networking permits free sharing of thoughts, pictures, videos, news, business, brands and other updates. In conclusion, despite articles on social media and its influences in the society with less focus on female students, this unique study carefully examine the impact of social media usage on female student's lifestyle with the help of artificial neural network. The study discover diverse impacts of social media usage both positive and negative which are result of advancement in modern technology. The findings highlights social media has more negative effects than positive effects on female social life. From our results, if we notice we can see that after training and testing dataset model's prediction is more accurate and accuracy is more than 90%. By using social media, their attitude, perceptions, fashion style, communication way changes. As female has become addicted to SM they waste time by chatting, unnecessary posting. They follow different culture, badly effected by others status, social position, interests, fashion which make them sometimes depressed. Social media have negative impact on female student's Personal interaction. Though Bangladeshi female social media user have more negative perspective regarding to social media use, there are some positive views also. Most of the female student use social media as a communication tool (for keeping touch with friends, relatives, classmates), for the purpose of learning and teaching, keeping them updated. Besides it helps reducing gender inequality, promotes good norms, behavior, social values.

5.2 Recommendations

The impact of social media reengineers social, historical, and personal lifestyle, views and thinking pattern of female students. To manage the effects on society, this study identifies a number of recommendations in the regard:

- Social media sites and applications should be culture-oriented both in content and features.
- Female students should spend lesser time on social media because it can be addictive and time consuming.
- Female students should limit believing everything they read, and watch on social media sites applications.

5.3 Future Scope

There are some future scopes with regard to this study. As we find by data analysis that social media has negative impact on female student in society other researchers can study and find the way to reduce negative effect. Government can take steps to ensure social media use in proper way. Besides it with the help of social media we can spread the negative effect to aware them. Another scope is making decision about personality-traits, personal choices, decision and preferences of Bangladeshi female students. Social media can be regarded as research tool. From this study, we get Facebook is most preferred social media among female students. With the help of this research female students who use Facebook their demographic profile, their interest, content sharing like photos, videos, their friendship status, group membership, location, likings, dislikings can be recorded.

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