

Course Code : BMM 723

Course Name : Artificial Neural Network for Biomedical Engineering

Name : TAUFIQ ABDULLAH

Student Id : 2028142037

Department : Biomedical Engineering

Program : Masters

Homework : 1

Date : 17.05.2021

Submitted To : DR. HAKAN YILMAZ

Department of Medical Engineering, Karabuk University, Turkey

1. **Classification** **Model:**

## Introduction:

## A dataset of diabetes prediction was analyzed for classification where the pregnancy, glucose, blood pressure, insulin, age and diabetes outcome was used to be features. The model was analyzed using jupyter python language.

### Techniques Used

1. Data Cleaning
2. Data Visualization
3. Machine Learning Modeling

### Algortihms Used

1. Support Vector Machine(SVM)
2. KNN
3. Random Forest Classifier

### Model Evaluation Methods Used

1. Accuracy Score
2. ROC AUC Curve
3. Cross Validation Guide Lines

### Packages and Tools Required:

1. Pandas
2. Matplotlib
3. Seaborn
4. Scikit Learn
5. Jupyter Notebook

### Package Installation

1. pip install numpy
2. pip install pandas
3. pip install seaborn
4. pip install scikit-learn
5. pip install matplotlib

**Best Result:**

In the system, Random forest algorithm has the highest accuracy 98% . The model can be improved with counting the number of lebels. in our model 30% is diabetic and 70% no diabetic patient. Therefore, Random forest algorithm was found to produce the best result.

1. **Regression Model** :

A dataset of carbon dioxide emission was investigated applying random forest algorithm. Here vehicle model, vehicle class, engine size, cylinder, fuel type, fuel consumption and carbon dioxide emission were used as features. The model was analyzed using jupyter python language.

### Techniques Used

1. Data Cleaning
2. Data Visualization
3. Machine Learning Modeling

### Algortihms Used

1. Polynomial Linear Regression
2. Decision Tree Regression
3. Random Forest Regression

### Packages and Tools Required:

1. Pandas
2. Matplotlib
3. Seaborn
4. Scikit Learn
5. Jupyter Notebook

### Package Installation

1. pip install numpy
2. pip install pandas
3. pip install seaborn
4. pip install scikit-learn
5. pip install matplotlib

**Best Result:**

In the system, Random forest regression algorithm has the highest accuracy 99%. While the the polynomial linear regression and the decision tree regression good accuracy of 98%. Therefore, Random forest algorithm was found to produce the best result.