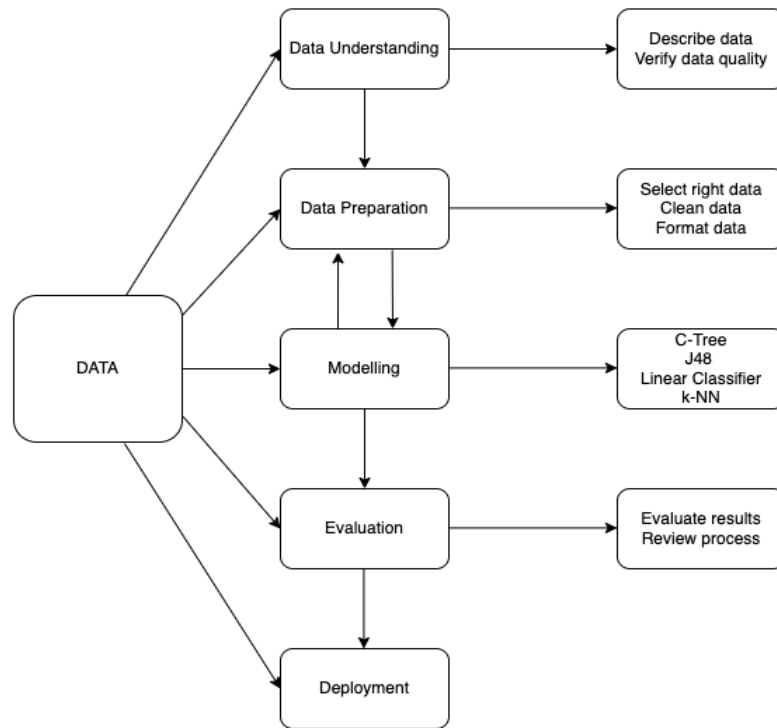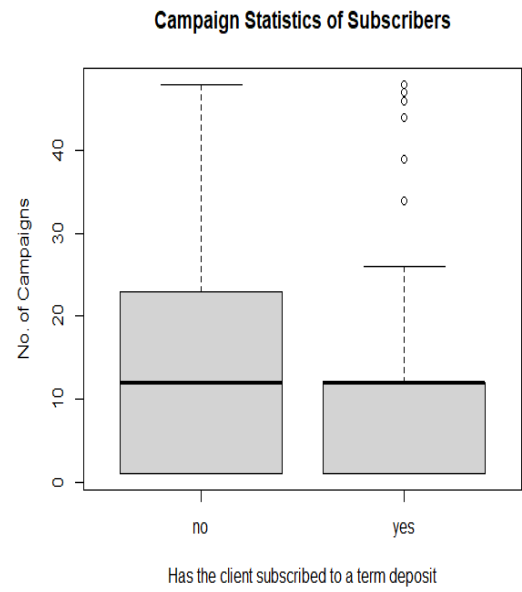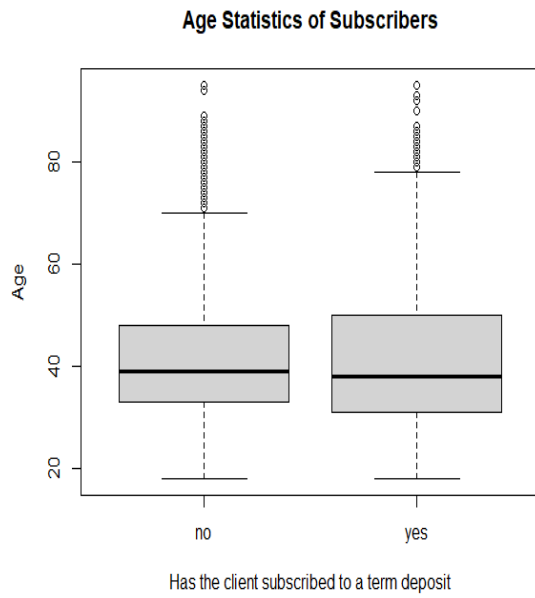# Experiment Design



*Illustration of dimension & descriptive statistics of the given dataset*

```
> #Statistics of Given Dataset with Selected Predictor Variables
> summary(BankData)
      age                  job            marital             education       default        balance        housing
 Min.   :18.00   blue-collar:9732   divorced: 5207   primary  : 6851   no :44396   Min.   : -8019   no :20081
 1st Qu.:33.00   management :9458   married :27214   secondary:23202   yes:  815   1st Qu.:    72   yes:25130
 Median :39.00   technician :7597   single  :12790   tertiary :13301               Median :   448
 Mean   :40.94   admin.     :5171                    unknown  : 1857               Mean   :  1362
 3rd Qu.:48.00   services   :4154                                                  3rd Qu.:  1428
 Max.   :95.00   retired    :2264                                                  Max.   :102127
                 (Other)    :6835
    loan             contact         campaign          pdays            previous          y
 no :37967   cellular :29285   1      :17544   -1    :36954   0      :36954   no :39922
 yes: 7244   telephone: 2906   2      :12505   182   :  167   1      : 2772   yes: 5289
             unknown  :13020   3      : 5521   92    :  147   2      : 2106
                               4      : 3522   183   :  126   3      : 1142
                               5      : 1764   91    :  126   4      :  714
                               6      : 1291   181   :  117   5      :  459
                               (Other): 3064   (Other): 7574   (Other): 1064
```
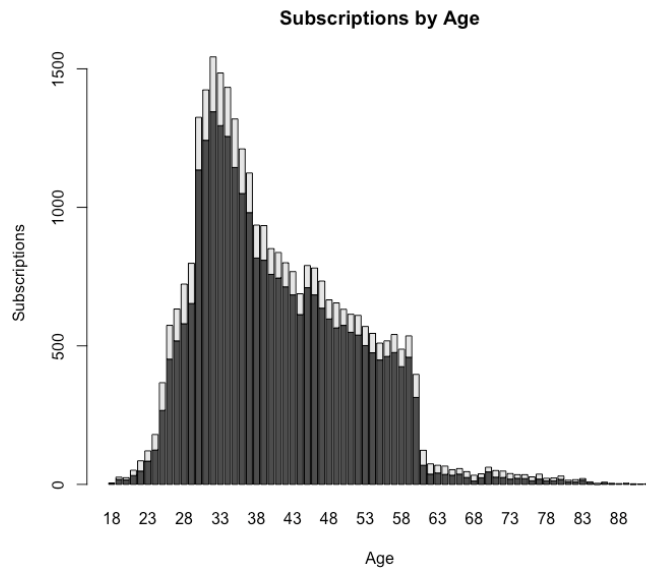
*Note: Statistics of the given dataset are composed of numerical and categorical variables*

**Age Statistics of Subscribers**

Age

80

60

40

20

no          yes

Has the client subscribed to a term deposit

**Campaign Statistics of Subscribers**

No. of Campaigns

40

30

20

10

0

no          yes

Has the client subscribed to a term deposit

*Barplot of subscribers by age from the new cleaned dataset*

**Subscriptions by Age**

Subscriptions

1500

1000

500

0

18  23  28  33  38  43  48  53  58  63  68  73  78  83  88

Age

# RESULTS

| Classifiers | Accuracy | Error Rate | Precision | Recall | F1-Score |
|---|---|---|---|---|---|
| **CTree** | 0. 85134 | 0. 14865 | 0 | 0 | 0 |
| **J48** | 0.8506955567 8 | 0.128498001 1 | 0 | 0 | 0 |
| **Linear** | 0.8538 | 0.1462 | 0 | 0 | 0 |
| **KNN** | 0.8598 | 0.1402 | 0.4231 | 0.0127 | 0.0246 |

**Classifier Comparison Based on Accuracy**

**Classifier Comparison Based on Error Rate**

**Classifier Comparison Based on Precision**



**Classifier Comparison Based on Recall**

# Classifier Comparison Based on F1-Score