

Statistical Modelling in R

Name: Ishika Shah

Roll no.: 42

#Consider the dataset below: - Consists of marks of students

#for M.Sc. program, the students scored in their internal

#examination and the percentage of marks scored in their

#final exams and the grades they received.

#Create predictive models to

#1. Determine the grade of the students.

#2. The percentage of marks obtained.

#Show the best accuracy score.

```
msc <- read.csv(file.choose())
```

```
msc
```

```
#EDA
```

```
str(msc)
```

```
dim(msc)
```

```
#Cleaning the dataset
```

```
library(dplyr)
```

```
msc = msc %>%
```

```
  rename(Exam1 = `Exam1`)
```

```
msc$Grade <- as.factor(msc$Grade)
```

```
msc$Pass.fail <- as.factor(msc$Pass.fail)
```

```
msc$Pass.fail <- ifelse(msc$Pass.fail == "P", 1, 0)
```

```
#Sampling the dataset
```

```
s <- sample(nrow(msc), 0.75*nrow(msc))
```

```
msc_tr <- msc[s,]
```

```
msc_ts <- msc[-s,]
```

#a) Determine the grade of the students

```
library(rpart)
```

```
grade <- rpart(Grade~., data = msc_tr, method = "class")
```

```
library(rattle)
```

```
fancyRpartPlot(grade)
```

```
printcp(grade)
```

```
plotcp(grade)
```

```
grade_prune <- rpart(Grade~., data = msc_tr, method = "class", control = rpart.control(cp=0.05))
```

```
fancyRpartPlot(grade_prune)
```

```
printcp(grade_prune)
```

```
plotcp(grade_prune)
```

#prediction

```
grade_p <- predict(grade, msc_ts, type = "class")
```

```
grade_p1 <- predict(grade_prune, msc_ts, type = "class")
```

```
t=table(msc_ts$Grade, grade_p)
```

```
accuracy = sum(diag(t))/sum(t)
```

```
accuracy
```

```
t1=table(msc_ts$Grade, grade_p1)
```

```
accuracy1 = sum(diag(t1))/sum(t1)
```

```
accuracy1
```

#b)The percentage of marks obtained

```
marks <- lm(Final_score~.-Pass.fail, data = msc_tr)
```

```
summary(marks)
```

```
marks_predict <- predict(marks, msc_ts)
```

```
marks_predict
```

#Accuracy

```
cor(marks_predict, msc_ts$Final_score)^2
```

```
marks_predict
```

```
percentage <- marks_predict/100
```

```
percentage
```