Data visualisation in R

Mohsin Mohammed

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

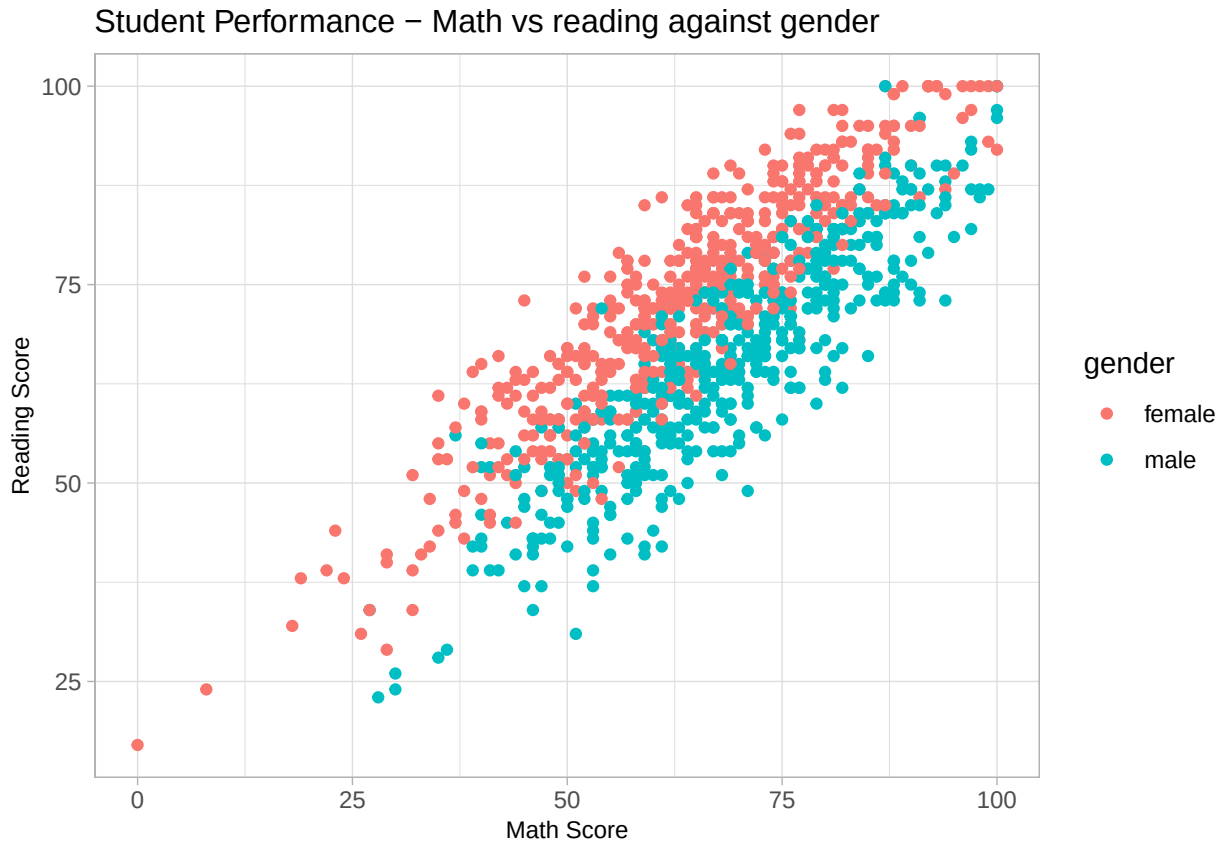
```
library(ggplot2)
```

Lets load the Student Performance data set and do exploratory data analysis.

```
data <- read.csv('./StudentsPerformance.csv')
```

Data visualization - 1 (Scatter plot)

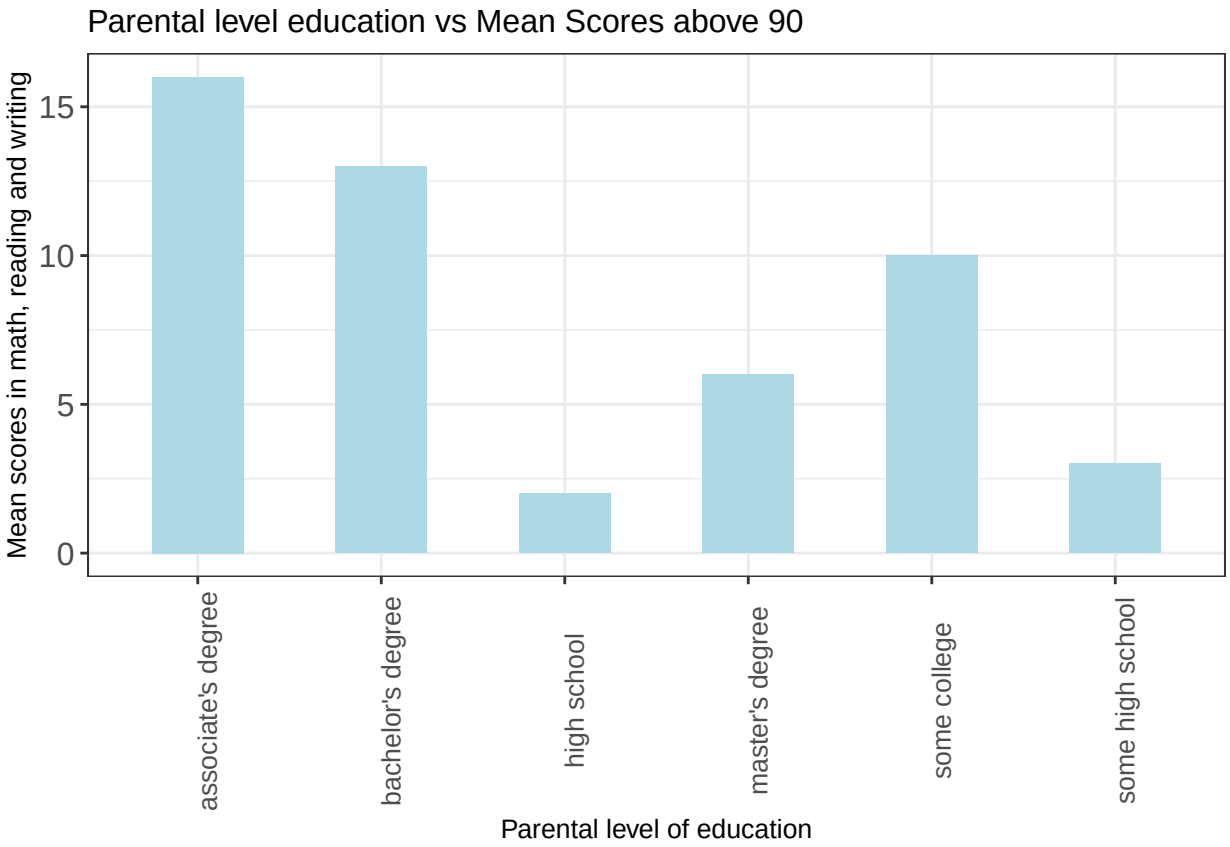
```
ggplot(data, aes(x=math.score, y=reading.score))+geom_point(aes(color=gender)) +
labs(y="Reading Score", x="Math Score",
     title="Student Performance - Math vs reading against gender") +
  theme_light() + theme(plot.title = element_text(size=12),
                        axis.title=element_text(size=9))
```



We can see that females scored better on reading compared to their counterpart. While males scored better on math. We can test this by switching the x and the y labels in the aes function parameter.

Data visualization - 2 (Bar Chart)

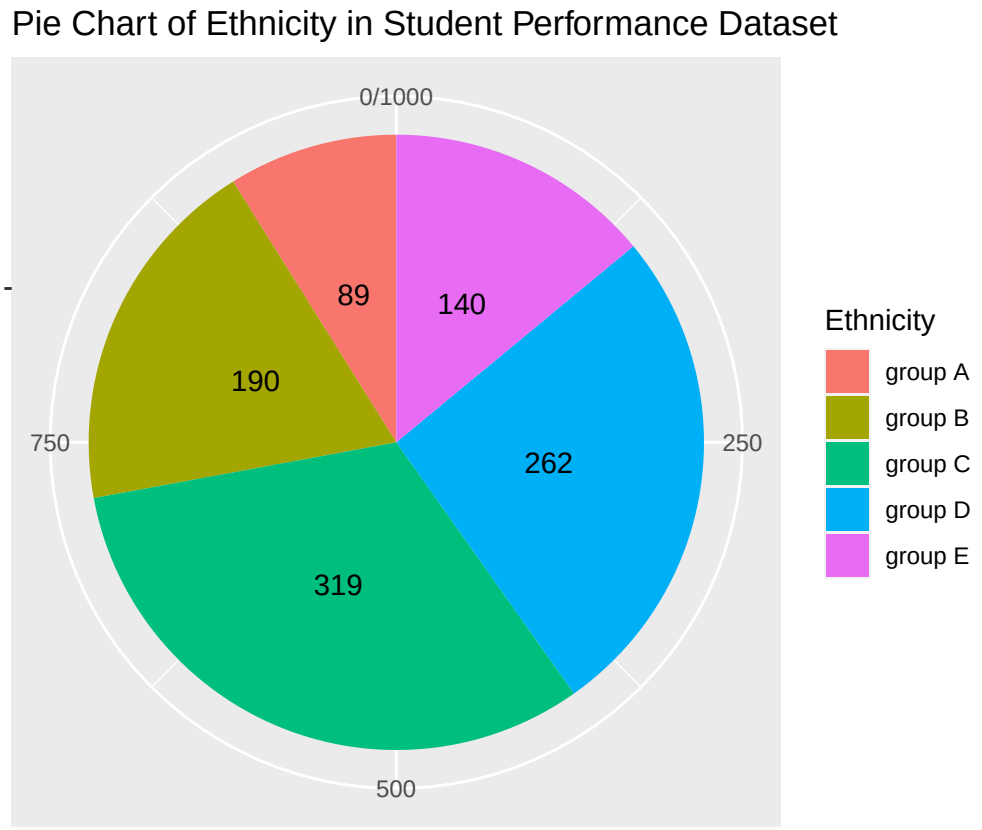
```
## calculating the mean of math, reading and writing scores:
ndata <- mutate(data, mean=(math.score + reading.score + writing.score)/3)

## plotting the mean scores > 90 against the parental level of
#education to understand the relation between them.
ggplot(ndata[ndata$mean>90,], aes(parental.level.of.education))+
geom_bar(stat="count", width = 0.5, fill="lightblue")+
 labs(x="Parental level of education",
         y="Mean scores in math, reading and writing",
       title="Parental level education vs Mean Scores above 90")+
theme_bw()+
theme(plot.title = element_text(size=12),
      axis.text.x= element_text(size=10, angle=90),
      axis.text.y= element_text(size=12), axis.title=element_text(size=10))
```



We started by finding the average scores of all students for math, reading and writing and plotted the means that were greater than 90 and plotted them against their parental level f education. We found that students whose parents have an associates degree scored the highest followed by parents who held a bachelors degree. This shows that there is a co relation between student performance and their parental level of education.

Data visualization - 3 (Pie Chart)

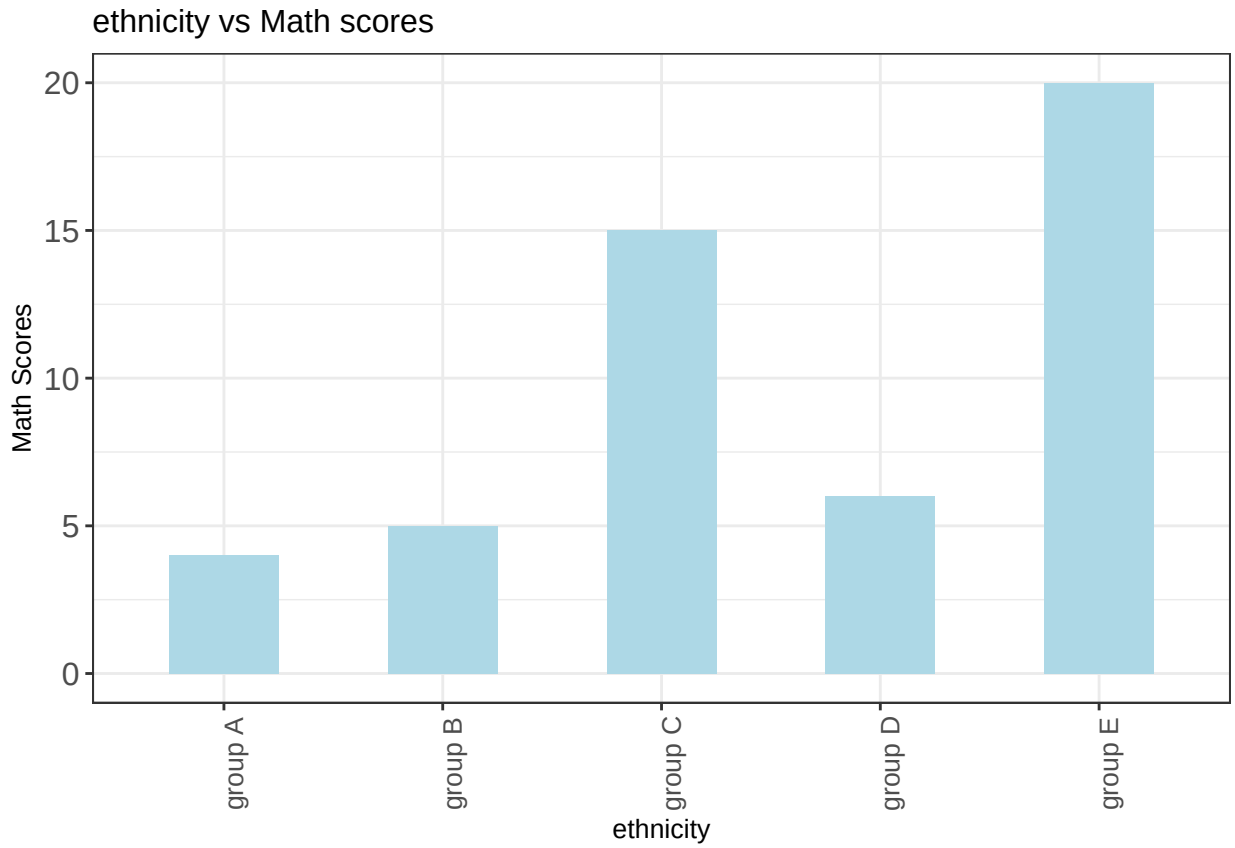
```
# Creating a table of counts of all the different categories in the ethnicity column
ethnicity_counts <- table(data$race.ethnicity)

# converting the counts table into a data frame:
ethnicity_df <- data.frame(ethnicity = names(ethnicity_counts),
                           count = ethnicity_counts)

# creating a pie chart of the ethnicity and their counts
ggplot(ethnicity_df, aes(x = "", y = count.Freq, fill = ethnicity)) +
  geom_bar(width = 1, stat = "identity") +
  coord_polar(theta = "y") +
  labs(fill = "Ethnicity", x = NULL, y = NULL,
       title = "Pie Chart of Ethnicity in Student Performance Dataset")+
  geom_text(aes(label=count.Freq), size=4, position=position_stack(vjust=0.5))
```



We can see that the majority of the students belong to the group C ethnicity followed by group D and Group A has the lowest representation.

Data Visualization - 4 (Bar Chart)

```
# lets see which ethnicity scores the highest in math
## plotting the mean scores > 90 against the parental level of education to
#understand the relation between them.
ggplot(ndata[data$math.score>90,], aes(race.ethnicity))+
geom_bar(stat="count", width = 0.5, fill="lightblue")+
 labs(x="ethnicity",
         y="Math Scores",
       title="ethnicity vs Math scores")+
theme_bw()+
theme(plot.title = element_text(size=12),
      axis.text.x= element_text(size=10, angle=90),
      axis.text.y= element_text(size=12), axis.title=element_text(size=10))
```



We can see that students belonging to ethnicity group E scored the highest in Math followed by group C.