STATISTICS PROJECT

CNO: C22018221368

ROLL NO: 3374

NAME: Parul Sharma

PROJECT NAME

To predict the distance travelled by a car after applying brakes at a certain speed.
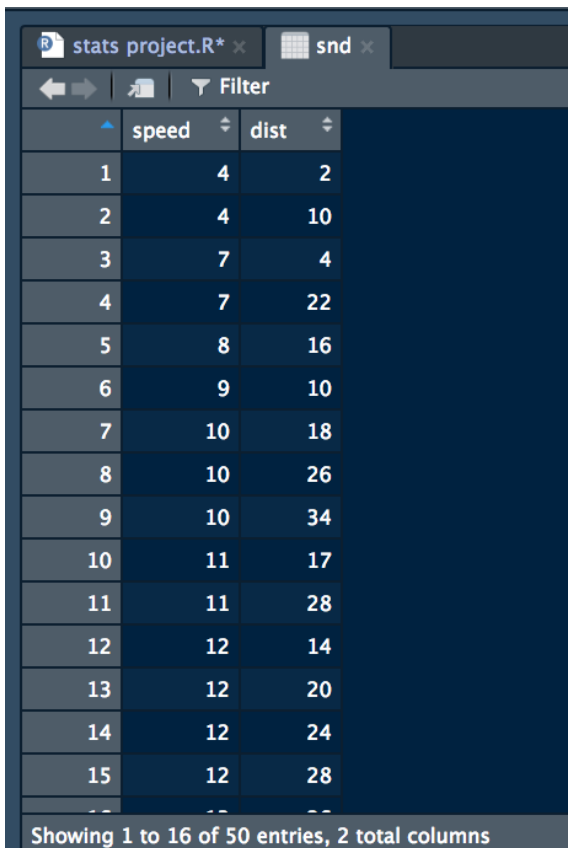
DATASET

I have chosen the inbuilt dataset from R-library from the datasets package.
The name of the dataset is "Cars".

FIELDS IN THE DATASET:

There are 2 columns in the dataset:

1. Speed
2. Distance

RECORDS IN THE DATASET

	speed	dist
1	4	2
2	4	10
3	7	4
4	7	22
5	8	16
6	9	10
7	10	18
8	10	26
9	10	34
10	11	17
11	11	28
12	12	14
13	12	20
14	12	24
15	12	28

Showing 1 to 16 of 50 entries, 2 total columns

There are 50 samples/observations in the dataset.

IMPLEMENTATION :

```r
# load the data
# This dataset gives the speed of cars and distance taken to stop
snd <- datasets::cars
print(snd)
# calculate karl pearson's correlation coefficient
cor(snd$speed,snd$dist,method = "pearson")
# calculate regression
# create simple regression model using lm() function
model <- lm(dist~speed, data = snd)
# print summary of the model
print(summary(model))
# print coefficients
coeff <- coefficients(model)
print(coeff)
# method   - using inbuilt function predicting data
newdata <- data.frame(speed = 50)
predict(model,newdata)
# scatterplot of the given dataset
plot(snd$speed,snd$dist,main = "Speed of Cars and Distance taken to stop ",
     xlab = "Speed",ylab = "Distance",col = "Red")
# plot the regression line
abline(model)
```

1.The dataset has been imported from the library and loaded into

2.The coefficient of correlation has been calculated to understand the accuracy of the dataset for prediction purposes.

3.Then I have calculated the Linear Regression.

4. The distance at which the car will stop after applying brakes when the car's speed in 50kmph is predicted.

5.Finally the scatter diagram along with regression line has been plotted.

OUTPUT:

```
> # calculate karl pearson's correlation coefficient
> cor(snd$speed,snd$dist,method = "pearson")
[1] 0.8068949
> # calculate regression
> # create simple regression model using lm() function
> model <- lm(dist~speed, data = snd)
> # print summary of the model
> print(summary(model))
```

We have also calculated the Correlation coefficient to check the accuracy of the dataset taken.

```
> # print coefficients
> coeff <- coefficients(model)
> print(coeff)
(Intercept)        speed
 -17.579095     3.932409
> # method  - using inbuilt function
> newdata <- data.frame(speed = 50)
> predict(model,newdata)
         1
179.0413
```

GRAPH:

Speed of Cars and Distance taken to stop
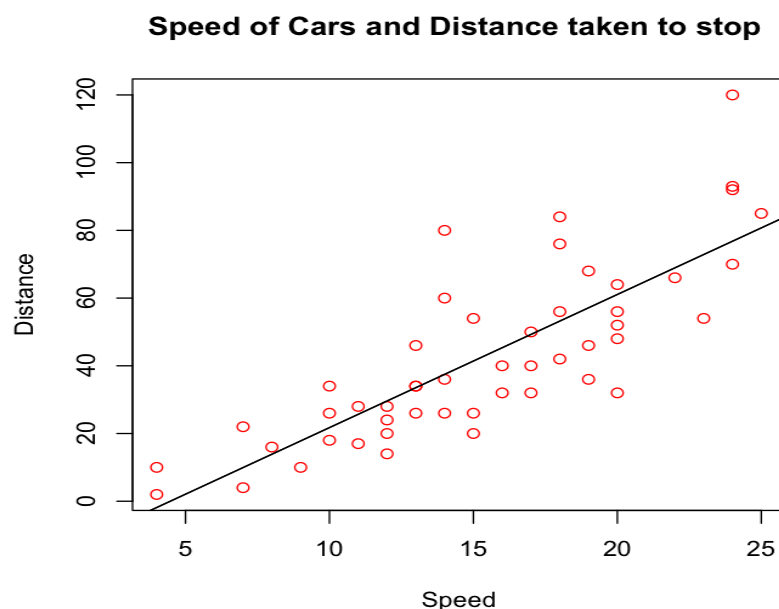
CONCLUSION:

I was able to predict the distance travelled by car when they applied brakes at a certain Speed using linear regression.