

Digital Assignment 1

Consider the following transportation dataset of three districts. It describes district code, District name, Transport mode, Total population and people who drove alone.

D_code	District	Transport Mode	Pop_total	Selfdrive_total
45	Ranipet	Bicycle	73560	2414
45	Ranipet	Bike	1634923	42902
78	Thirupatthur		797818	21348
78	Thirupatthur		3865125	75246
78	Thirupatthur	Bicycle	42880	1088
78	Thirupatthur		7710301	399041
111	Vellore	Car	373402	13922
111	Vellore	Bicycle	27313	1075
111	Vellore	Bike	14525322	557036

Registration Number: 19BCE2119

Name: Gaurav Kumar Singh

Subject: Data Visualization(CSE 3020) L13+L14

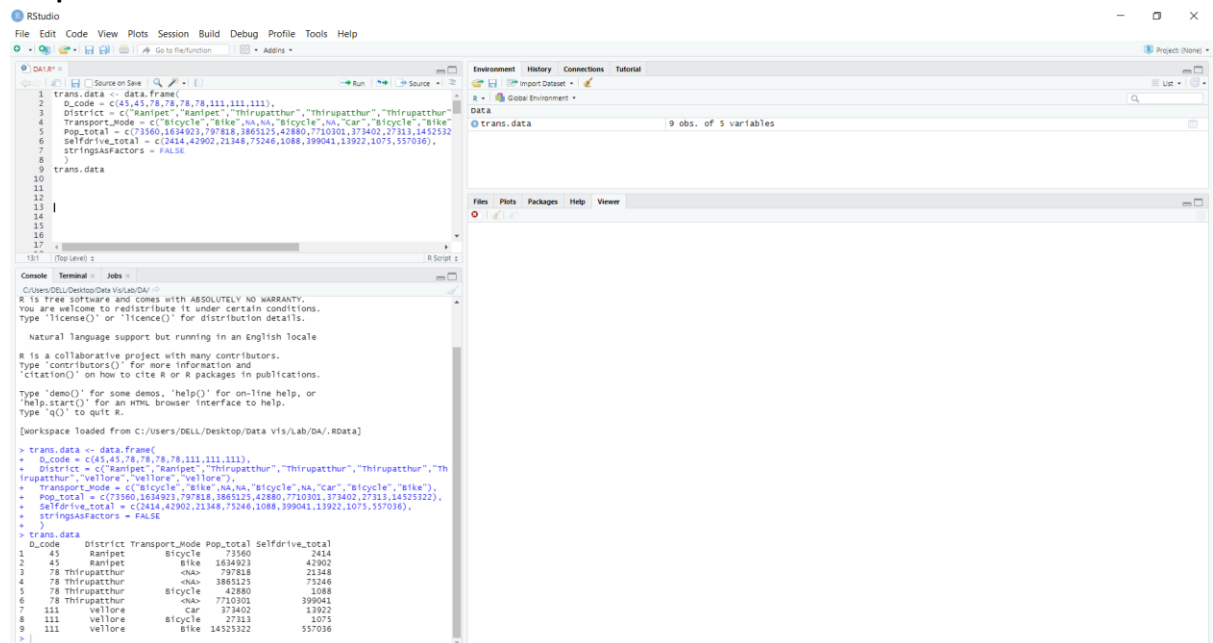
Write R code for the below questions

a) Create data frame for the above data

Code:

```
trans.data <- data.frame(  
  D_code = c(45,45,78,78,78,78,111,111,111),  
  District =  
  c("Ranipet", "Ranipet", "Thirupattur", "Thirupattur", "Thirupattur", "Thirupattur", "Vellore",  
    "Vellore", "Vellore"),  
  Transport_Mode = c("Bicycle", "Bike", NA, NA, "Bicycle", NA, "Car", "Bicycle", "Bike"),  
  Pop_total = c(73560, 1634923, 797818, 3865125, 42880, 7710301, 373402, 27313, 14525322),  
  Selfdrive_total = c(2414, 42902, 21348, 75246, 1088, 399041, 13922, 1075, 557036),  
  stringsAsFactors = FALSE  
)
```

Output:



The screenshot shows the RStudio interface. The script editor on the left contains the R code to create the 'trans.data' data frame. The console on the bottom left shows the execution of the code, including the R startup message and the final data frame output. The Environment pane on the right shows the 'trans.data' object with 9 observations and 5 variables.

```
> trans.data  
  D_code District Transport_Mode Pop_total Selfdrive_total  
1    45  Ranipet      Bicycle      73560             2414  
2    45  Ranipet        Bike    1634923             42902  
3    78 Thirupattur      <NA>     797818             21348  
4    78 Thirupattur      <NA>    3865125             75246  
5    78 Thirupattur      Bicycle     42880              1088  
6    78 Thirupattur      <NA>    7710301            399041  
7   111  Vellore        Car       373402              13922  
8   111  Vellore      Bicycle     27313               1075  
9   111  Vellore      Bike    14525322            557036
```

b) How many observations of 'district' are missing from the data frame**Code:**

```

i<-1
x=c()
for (n in 1:length(trans.data$Selfdrive_total)){
  if (is.na(trans.data[n, 'Transport_Mode'])) {
    x[i]<-trans.data[n, 'District']
    i<-i+1
  }
}
x
length(unique(x))

```

Output:

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains the R script code for identifying missing transport modes and extracting district names.
- Environment:** Shows the 'trans.data' object with 9 observations and 5 variables.
- Console:** Displays the execution output, including the data frame structure and the resulting vector 'x' containing the district names 'Thirupattur' and 'Thirupattur'.

Environment:

Object	Class	Attributes
trans.data	data.frame	9 obs. of 5 variables

Console Output:

```

> trans.data
  D_code District Transport_Mode Pop_total Selfdrive_total
1    45  Ranipet      B1cycle    73560         2414
2    45  Ranipet      B1ke     1694923         42902
3    78 Thirupattur    <NA>     797818         21348
4    78 Thirupattur    <NA>    3885125         75246
5    78 Thirupattur      B1cycle    42860         1068
6    78 Thirupattur    <NA>    7710301        399041
7   111  Vellore      Car     373402         13922
8   111  Vellore      B1cycle    27113         1075
9   111  Vellore      B1ke    14525322        557036

> i<-1
> x=c()
> for (n in 1:length(trans.data$Selfdrive_total)){
+   if (is.na(trans.data[n, 'Transport_Mode'])) {
+     x[i]<-trans.data[n, 'District']
+     i<-i+1
+   }
+ }
> x
[1] "Thirupattur" "Thirupattur"
> length(unique(x))
[1] 1

```

c) Count the number of self-drive in each district.**Code:**

```

z=unique(trans.data$District)
y<-trans.data$D_code
y<-unique(y)
sdt=c(0, 0, 0)
for (p in 1:length(y)){
  for (q in 1:length(trans.data$Selfdrive_total)){
    if (trans.data$D_code[q]==y[p]) {
      sdt[p]=sdt[p]+trans.data$Selfdrive_total[q]
    }
  }
}
sdt.data <- data.frame(y,z,sdt)
sdt.data

```

Output:

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains the R code for counting self-drive vehicles by district.
- Console:** Displays the output of the code, showing a data frame with columns y, z, and sdt. The output is as follows:

	y	z	sdt
1	45	Ranipet	45316
2	78	Thirupattur	496723
3	111	Vellore	572033
- Environment:** Shows the variables created during execution: n, p, q, sdt, x, y, z. The values for y, z, and sdt are:

Variable	Value
y	num [1:3] 45316 496723 572033
z	chr [1:3] "Thirupattur" "Thirupattur" "Thirupattur"
x	num [1:3] 45 78 111
y	chr [1:3] "Ranipet" "Thirupattur" "Vellore"

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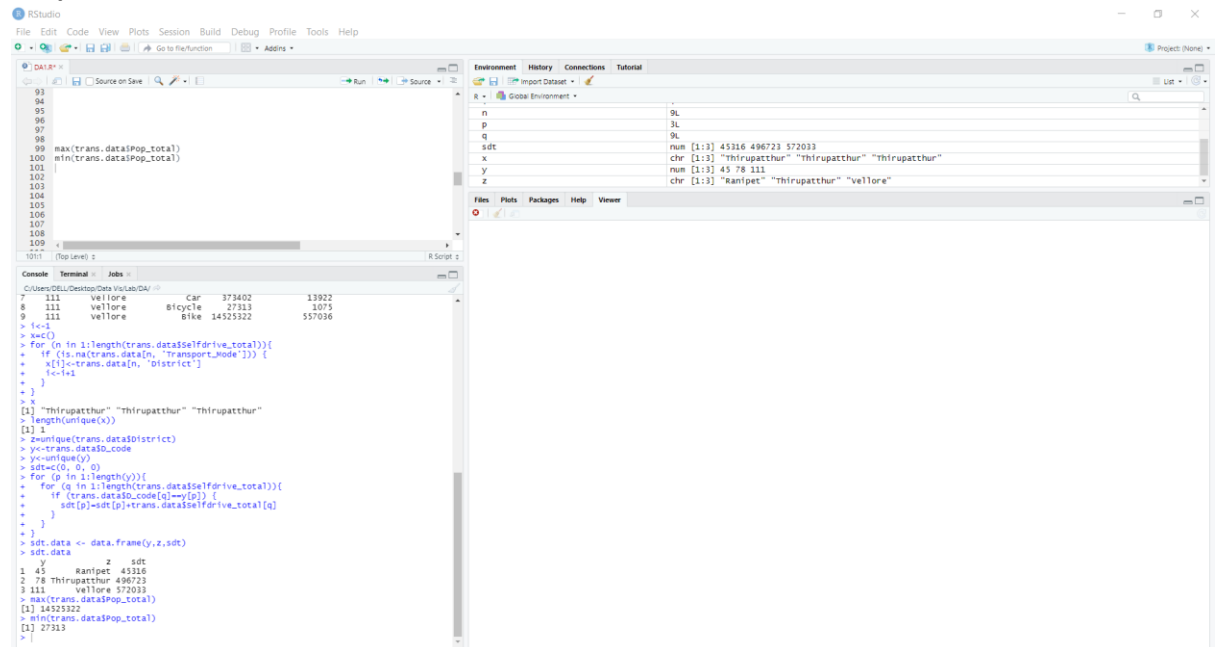
d) Print max and min of pop_total.

Code:

```
max(trans.data$Pop_total)
```

```
min(trans.data$Pop_total)
```

Output:



The screenshot shows the RStudio interface. The script editor contains R code to calculate the maximum and minimum population totals for different districts. The console shows the execution of this code, resulting in the maximum population total of 14525322 for Thirupattur and the minimum of 27313 for Vellore.

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99 max(trans.data$Pop_total)  
100 min(trans.data$Pop_total)  
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111 (Top Level) >
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9 111 Vellore Bicycle 27313 1075  
10 111 Vellore Bike 14525322 557096  
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```

e) Derive new information/print "percentage of people who drove alone in all three districts" and also rank districts based on the % of people who used bicycle.

Code:

```
popt=c(0, 0, 0)
for (p in 1:length(y)){
  for (q in 1:length(trans.data$Selfdrive_total)){
    if (trans.data$D_code[q]==y[p]) {
      popt[p]=popt[p]+trans.data$Pop_total[q]
    }
  }
}
sdt.data <- data.frame(y,z,sdt,popt)
sdt.data
sdtper=(sdt.data$sdt/sdt.data$popt)*100
sdt.data <- data.frame(y,z,sdt,popt,sdtper)
sdt.data
Bicy=c()
d=1
for (h in 1:9){
  if(!is.na(trans.data[h, 'Transport_Mode']) & trans.data$Transport_Mode[h]=="Bicycle"){
    Bicy[d]=trans.data$Pop_total[h]
    d<-d+1
  }
}
sdt.data <- data.frame(y,z,sdt,popt,sdtper,Bicy)
sdt.data
Bicyper=(sdt.data$Bicy/sdt.data$popt)*100
sdt.data <- data.frame(y,z,sdt,popt,sdtper,Bicy,Bicyper)
sdt.data
```

Output:

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains the R code used to calculate the percentage of people who drove alone (sdtper) and the percentage of people who used bicycles (Bicyper).
- Environment:** Displays the objects created in the global environment, including the data frame 'sdt.data'.
- Console:** Shows the output of the R code, including the structure of the data frame and the final data values.

The final output of the code is a data frame with 4 columns: y, z, sdtper, and Bicyper. The data is as follows:

y	z	sdtper	Bicyper
45	Ranipet	45316	1708483
78	Thirupattur	496723	12416124
111	Vellore	572033	14926037

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Subject: Data Visualization(CSE 3020) L13+L14