INFORMATICS INSTITUTE OF TECHNOLOGY
In Collaboration with
UNIVERSITY OF WESTMINSTER,UK

4COSC001W : Software Development I Coursework

Coursework I:Individual Project
Current traffic Flow Analysis

Group No:12

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A Dissertation by

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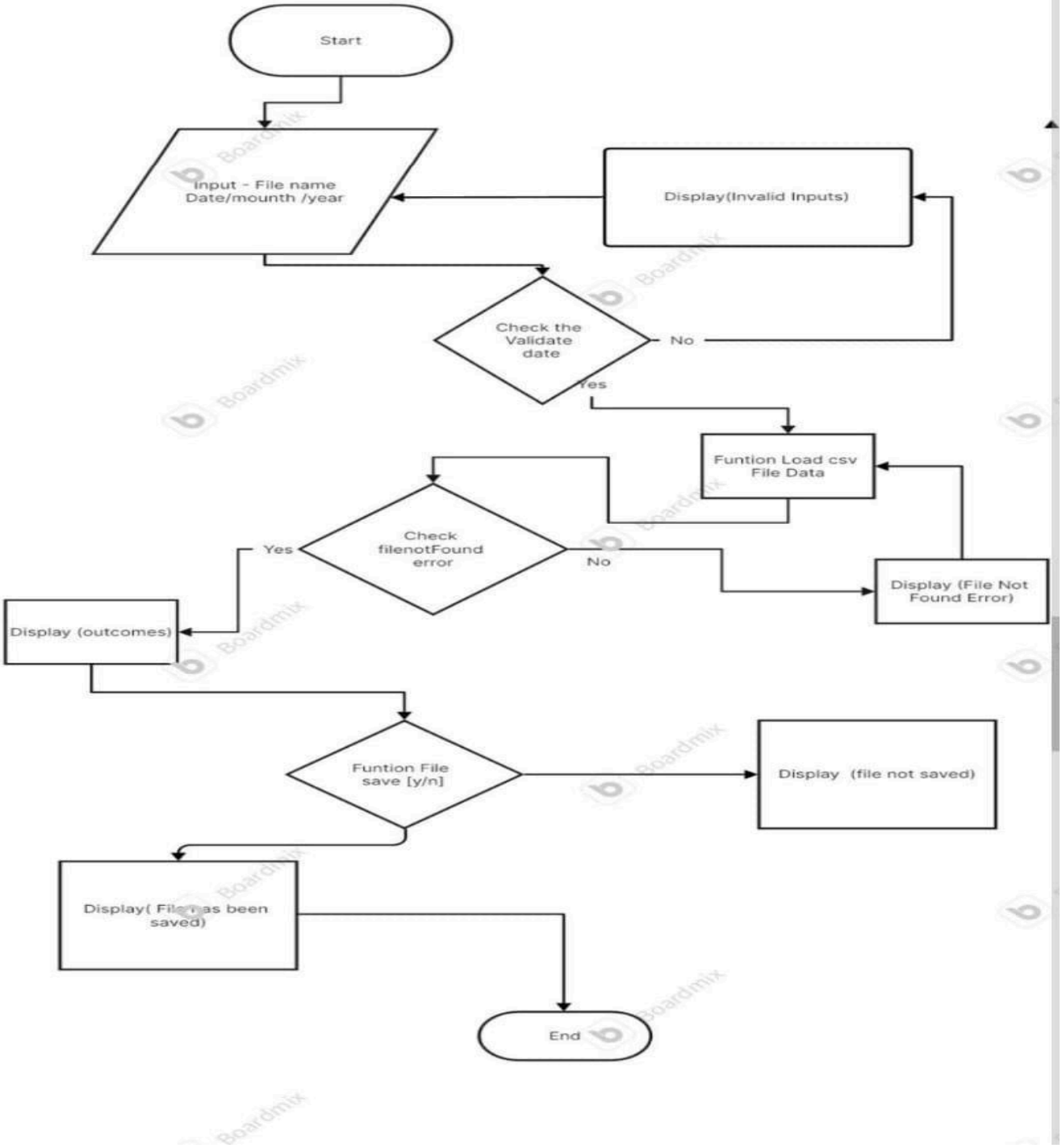
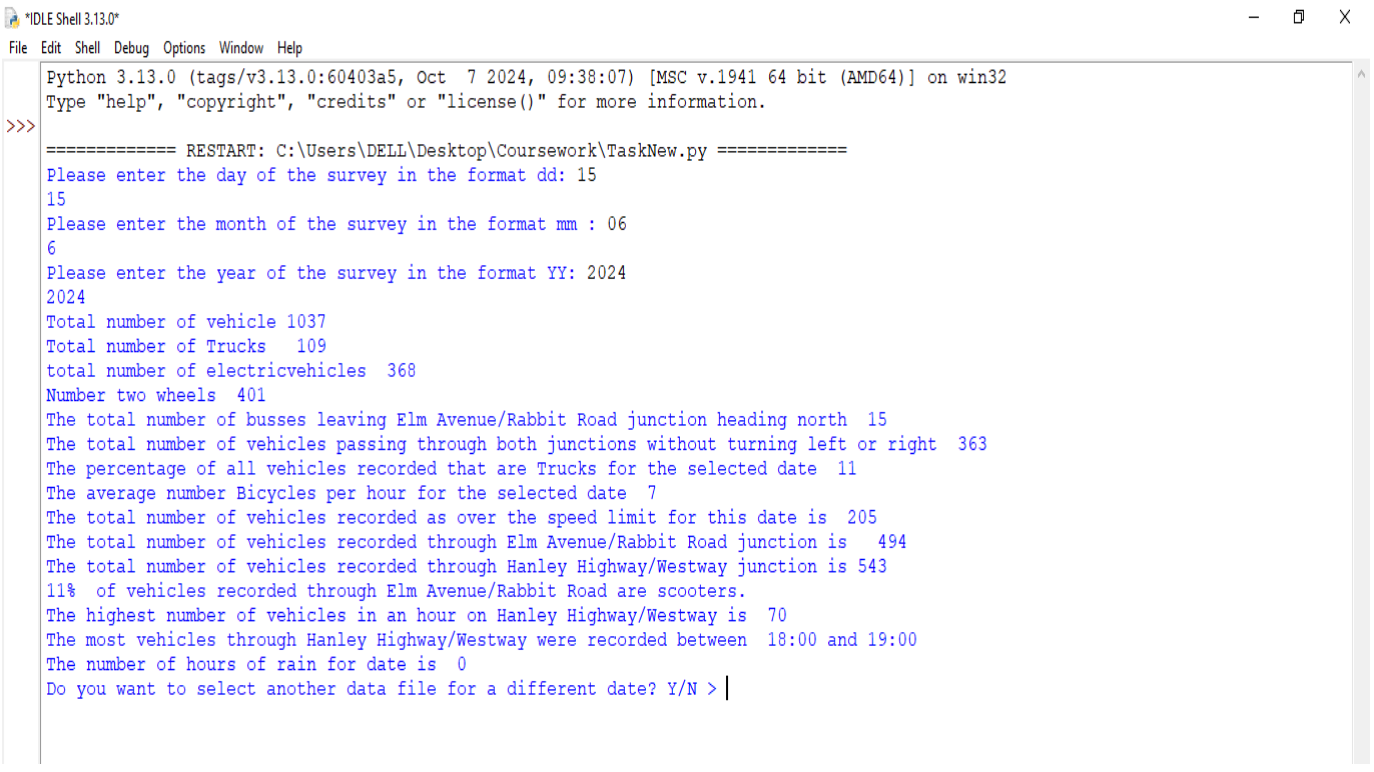
Flow chart


Start
Input - File name
Date/mounth /year
Display(Invalid Inputs)
Check the
Validate
date
No
Yes
Funtion Load csv
File Data
Check
filenotFound
error
Yes
No
Display (File Not
Found Error)
Display (outcomes)
Funtion File
save [y/n]
Display (file not saved)
Display(File has been
saved)
End

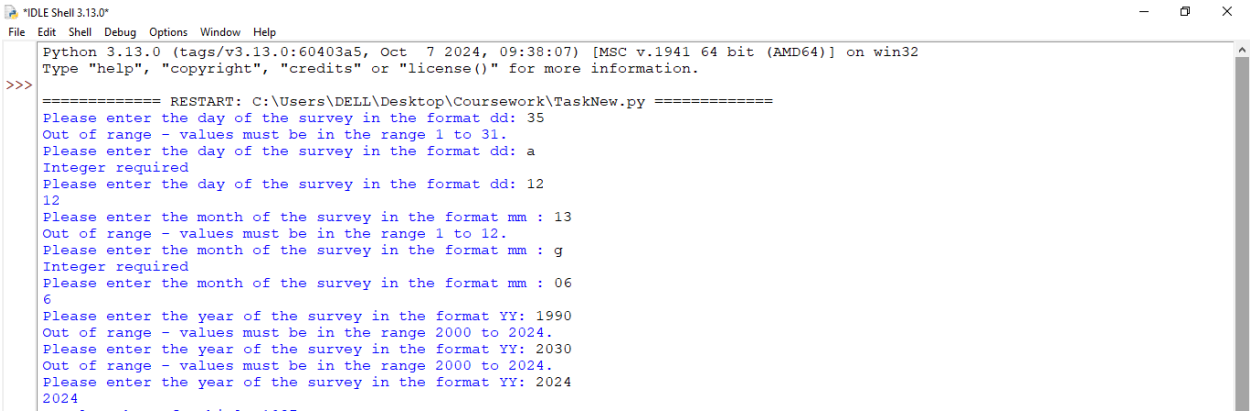
Test Cases.

Input Validation

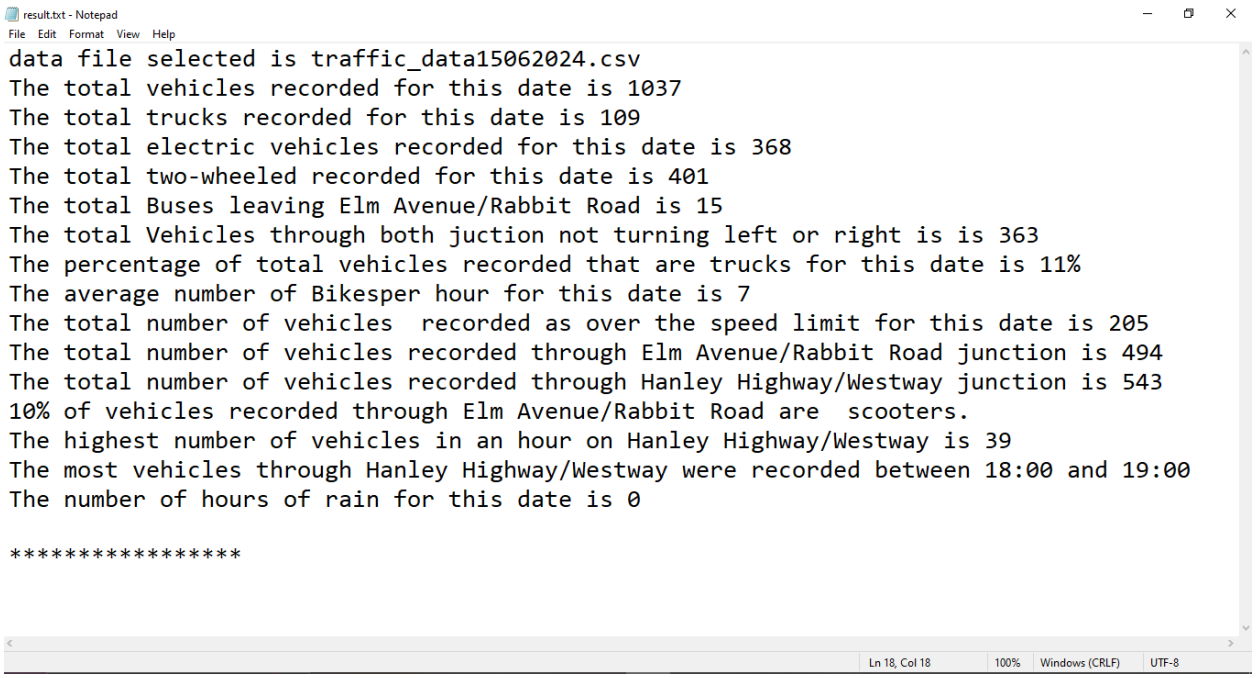
Test	Input	Expected Output	Actual output	Resault
01.Validate User Inputs (Date/Month/Year)	Day - 15 Month - 06 Year - 2024	Proceed to the following lines.	Use the inputs to access the CSV file	PASS
02.If user input wrong Inputs	Day - 02 Month - 12 Year - 2020	Result that the user re-enter	Catching in th try,Except and giving a user display a file not found error	PASS



02.



Test	Input	Expected Output	Actual Output	Resault
03. Vertify if the user wants to export as a text file	Input = “Y ”or “y”	Save the output as text file	Save the result as a text document	PASS
04.if the user want to leave the application	input=”Y”or “y”	Exit from the program	Withdrawing from the program	PASS


result.txt - Notepad
File Edit Format View Help
data file selected is traffic_data15062024.csv
The total vehicles recorded for this date is 1037
The total trucks recorded for this date is 109
The total electric vehicles recorded for this date is 368
The total two-wheeled recorded for this date is 401
The total Buses leaving Elm Avenue/Rabbit Road is 15
The total Vehicles through both juction not turning left or right is is 363
The percentage of total vehicles recorded that are trucks for this date is 11%
The average number of Bikesper hour for this date is 7
The total number of vehicles recorded as over the speed limit for this date is 205
The total number of vehicles recorded through Elm Avenue/Rabbit Road junction is 494
The total number of vehicles recorded through Hanley Highway/Westway junction is 543
10% of vehicles recorded through Elm Avenue/Rabbit Road are scooters.
The highest number of vehicles in an hour on Hanley Highway/Westway is 39
The most vehicles through Hanley Highway/Westway were recorded between 18:00 and 19:00
The number of hours of rain for this date is 0
****
Ln 18, Col 18
100%
Windows (CRLF)
UTF-8

03.PSEUDOCODE

```
START
Function Main
    call validate_date_input()
    call validate_month_input()
    call validate_year_input()
    csv_file_name = sv_file_name = "traffic_data" + day + month+ year
    data = process_csv_data(csv_file_name)
    IF data is None
        Display"dta file not found for the given date.please try again"
        call Main
    Else
        call collect_outcomes(data)
        call save_results_to_file(data)
        Ask user if they want to select another date(Y/N)
          If user choose 'Y'
             call main
          Else if user choose 'N'
           display "End of the run"
           Exit
          Else
           Display "Invalid input.Please enter 'Y' or 'N' "
           call Main
     End If
```

call clear_counts_vehicle()

Intitialize GUI

craete Tkinter window

create histrogram object with vehicle_hour_hanley,vehicle_hour_elm and formatted_day

Run Tkinter main loop

End Main

Funtion validate_date_input

WHILE True DO

DISPLAY"Please enter the date of the survey in the format dd : "

If input is valid and in the range 1-31

return input

else

Display "Integer required"

Funtion validate_month_input

WHILE True DO

DISPLAY"Please enter the month of the survey in the format mm : "

If input is valid and in the range 1-12

return input

else

Display "Integer required"

Funtion validate_year_input

WHILE True DO

DISPLAY"Please enter the yrae of the survey in the format YY : "

If input is valid and in the range 2000-2004

return input

```
        else
            Display "Integer required"

Function process_csv_data(file_name)
    open file_name.csv

    Try:
        Read all lines
        split data into header and rows
        Initialize vehicle_hour_hanley and vehicle_hour_elm
        loop throught rows and collect data:
                count vehiclr types,speed limites,junctions,ect.
                Track counts for vehicle_hour_hanley and vehicle_hour_elm
        return results as dictionary
    catch FileNotFoundError:
        Display "Data file does not exist for the given date! Try again with a
different date"
        Return None

Funtion collect_outcomes(outcomes)
        For each key,value in outcome
print key formatted with value

Funtion save_results_to_file(outcomes,file_name="results.txt")
        open(file_name,"a")as file for appending
        For each key,value in outcomes
                write key formatted with value
```

write "**********" as a separator

print "Resault save to file"

Funtion clear_counts_vehicle()

clear vehicle_hour_hanley and vehicle_hour_elm

print "Vehicle counts cleared"

Funtion HistogramApp(window,vehicle_hour_elm,vehicle_hour_hanley,formatted_day)

Intialize the app with given parameters

Create axes,bars,legend,footer in the GUI

Run the GUI main loop

funtion __init__(self,window,task1,task2,date): #initialize the graphic with tkinter root

self.window = window

self.window.title("Histrogram")

self.date = date

self.task1 = task1

self.task2 = task2

self.Canvas_width = 1200 #full width of the Canvas

self.Canvas_height = 400

self.padding = 100

#define barchart properties

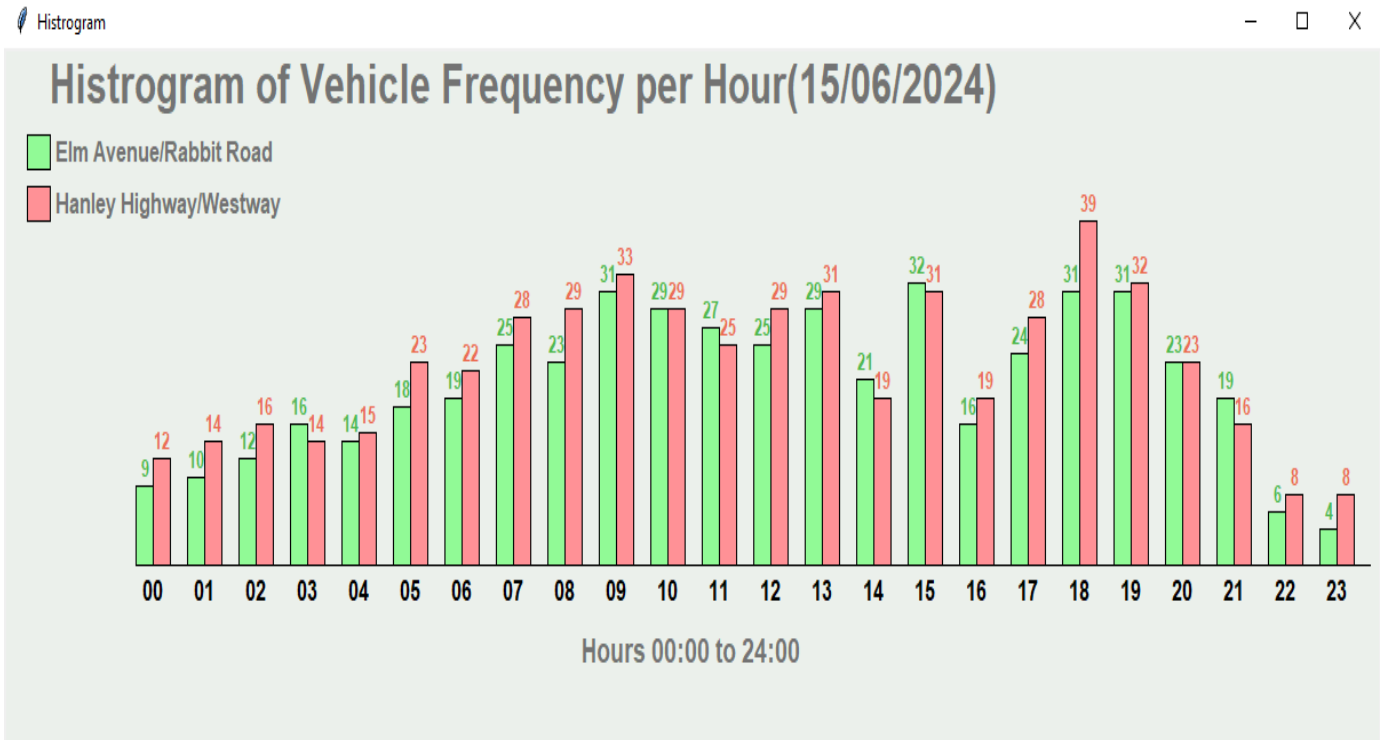
```
self.width = 15                         #width of individuals bar
self.bar_gap = 0                        #gap between the bar is 0
self.groupspacing = 15                      #space between different bargroups
self.bargraph_width = 0

self.max_value = max(max(task1.values()), max(task2.values()))
self.measure = (Canvas_height-2* padding) / max_value

#define colors

self.textcolor = "#747673"
self.firstbarcolor = "#95fb97"
self.secondbarcolor = "#ff9496"

#make a canva to draw the graph
Canvas = tk.Canvas(
    self.window,
    width = self.Canvas_width,
    height = self.Canvas_height,
    background = "#edf2ee"                  #Light color for background
)

self.Canvas.pack()                      #add it to tk window


#draw all of the bar chart
createbars( self)
```

```
        createlegend( self)
        createfooter_text( self)


Funtion createaxes(self):
    self.Canvas.create_line(padding + groupspacing,Canvas_height -
self.padding,bargraph_width,Canvas_height - padding,width = 1,fill = 'black')


Funtion createbars(self):
        x = padding + groupspacing          #starting x-coordinate for first group
        x2 = 0

Funtion createlegend(self):
        legend_xbeging = 20             # strat x-coordinate for legend
          legend_ybegin = 50             # strat y-coordinate for legend


        self.Canvas.create_text(legend_xbeging + 20,legend_ybegin -30,text =
"Histrogram of Vehicle Frequency per Hour({})".format(self.date),anchor =
"w",font("Arial",24,"bold"),fill = self.textcolor)

        Canvas.create_rectangle(

legend_xbeging,legend_ybegin+20,legend_xbeging+20,legend_ybegin,outline =
"black",fill = firstbarcolor)
```

```
        Canvas.create_text(
            legend_xbeging +25,legend_ybegin+10,text="Elm Avenue/Rabbit
Road",anchor = "w",font = ("Arial",12,"bold"),fill = textcolor)

        #legend entry of first dataset
        Canvas.create_rectangle(

legend_xbeging,legend_ybegin+30,legend_xbeging+20,legend_ybegin+50,outline
= "black",fill = secondbarcolor)

        Canvas.create_text(
            legend_xbeging+25,legend_ybegin+40,text = "Hanley
Highway/Westway",anchor = "w",font = ("Arial",12,"bold"),fill = textcolor)

    Funtion createfooter_text(self):
        Canvas.create_text(Canvas_width/2,Canvas_height -self.padding+50,text =
"Hours 00:00 to 24:00",fill = self.textcolor,font = ("Arial",14,"bold")
 END
```

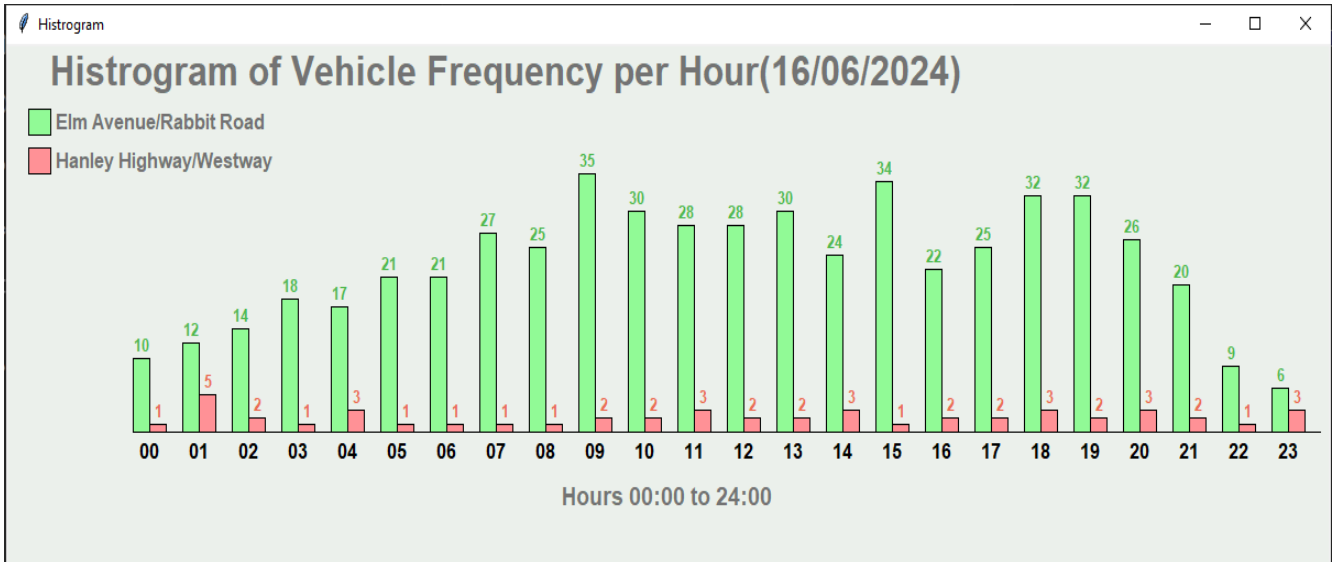
TEST CASES

```
Please enter the day of the survey in the format dd: p
Integer required
Please enter the day of the survey in the format dd: 32
Out of range - values must be in the range 1 to 31.
Please enter the day of the survey in the format dd: 15
Please enter the month of the survey in the format mm : March
Integer required
Please enter the month of the survey in the format mm : 13
Out of range - values must be in the range 1 to 12.
Please enter the month of the survey in the format mm : 06
Please enter the year of the survey in the format YY: 1997
Out of range - values must be in the range 2000 to 2024.
Please enter the year of the survey in the format YY: 2024
************************
data file selected is traffic_data15062024.csv
************************
Total number of vehicle 1037
Total number of Trucks   109
total number of electricvehicles  368
Number two wheels  401
The total number of busses leaving Elm Avenue/Rabbit Road junction heading north  15
The total number of vehicles passing through both junctions without turning left or right
The percentage of all vehicles recorded that are Trucks for the selected date  11
The average number Bicycles per hour for the selected date  7
The total number of vehicles recorded as over the speed limit for this date is  205
The total number of vehicles recorded through Elm Avenue/Rabbit Road junction is   494
The total number of vehicles recorded through Hanley Highway/Westway junction is 0
11%  of vehicles recorded through Elm Avenue/Rabbit Road are scooters.
The highest number of vehicles in an hour on Hanley Highway/Westway is  39
The most vehicles through Hanley Highway/Westway were recorded between  18:00 and 19:00
The number of hours of rain for date is  0

Text has been appended to file
Do you want to select another data file for a different date? Y/N > n
End of the run
Vehicle counts of data cleared.
```


Histrogram
Histrogram of Vehicle Frequency per Hour(15/06/2024)
Elm Avenue/Rabbit Road
Hanley Highway/Westway
9 12
10 14
12 16
16 14
14 15
18 23
19 22
25 28
23 29
31 33
29 29
27 25
25 29
29 31
21 19
32 31
16 19
24 28
31 39
31 32
23 23
19 16
6 8
4 8
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hours 00:00 to 24:00

```
Text has been appended to file
Do you want to select another data file for a different date? Y/N > 20
Invalid input. Please enter 'Y' or 'N'
Please enter the day of the survey in the format dd: n
Integer required
Please enter the day of the survey in the format dd:
```

```
Please enter the day of the survey in the format dd: 15
Please enter the month of the survey in the format mm : 06
Please enter the year of the survey in the format YY: 2024
************************
data file selected is traffic_data15062024.csv
************************
Total number of vehicle 1037
Total number of Trucks   109
total number of electricvehicles  368
Number two wheels  401
The total number of busses leaving Elm Avenue/Rabbit Road junction heading north  15
The total number of vehicles passing through both junctions without turning left or right  363
The percentage of all vehicles recorded that are Trucks for the selected date  11
The average number Bicycles per hour for the selected date  7
The total number of vehicles recorded as over the speed limit for this date is  205
The total number of vehicles recorded through Elm Avenue/Rabbit Road junction is   494
The total number of vehicles recorded through Hanley Highway/Westway junction is 0
11%  of vehicles recorded through Elm Avenue/Rabbit Road are scooters.
The highest number of vehicles in an hour on Hanley Highway/Westway is  39
The most vehicles through Hanley Highway/Westway were recorded between  18:00 and 19:00
The number of hours of rain for date is  0

Text has been appended to file
Do you want to select another data file for a different date? Y/N > y
Please enter the day of the survey in the format dd: 16
Please enter the month of the survey in the format mm : 06
Please enter the year of the survey in the format YY: 2024
************************
data file selected is traffic_data15062024.csv
************************
Total number of vehicle 101
Total number of Trucks   11
total number of electricvehicles  29
Number two wheels  29
The total number of busses leaving Elm Avenue/Rabbit Road junction heading north  0
The total number of vehicles passing through both junctions without turning left or right  38
The percentage of all vehicles recorded that are Trucks for the selected date  11
```




```
========= RESTART: C:\Users\DELL\Desktop\CW ABC\Coursework\w2120052.py =========
Please enter the day of the survey in the format dd: 04
Please enter the month of the survey in the format mm : 12
Please enter the year of the survey in the format YY: 23
Out of range - values must be in the range 2000 to 2024.
Please enter the year of the survey in the format YY: 05
Out of range - values must be in the range 2000 to 2024.
Please enter the year of the survey in the format YY: 04
Out of range - values must be in the range 2000 to 2024.
Please enter the year of the survey in the format YY: 2022
Data file does not exist for the given date! Try again with a different date
Please enter the day of the survey in the format dd:
```

```
The total number of vehicles recorded as over the speed limit for this date is  205
The total number of vehicles recorded through Elm Avenue/Rabbit Road junction is   494
The total number of vehicles recorded through Hanley Highway/Westway junction is 0
11%  of vehicles recorded through Elm Avenue/Rabbit Road are scooters.
The highest number of vehicles in an hour on Hanley Highway/Westway is  39
The most vehicles through Hanley Highway/Westway were recorded between  18:00 and 19:00
The number of hours of rain for date is  0

Text has been appended to file
Do you want to select another data file for a different date? Y/N > y
Please enter the day of the survey in the format dd: 16
Please enter the month of the survey in the format mm : 06
Please enter the year of the survey in the format YY: 2024
************************
data file selected is traffic_data15062024.csv
************************
Total number of vehicle 101
Total number of Trucks   11
total number of electricvehicles  29
Number two wheels  29
The total number of busses leaving Elm Avenue/Rabbit Road junction heading north  0
The total number of vehicles passing through both junctions without turning left or right  38
The percentage of all vehicles recorded that are Trucks for the selected date  11
The average number Bicycles per hour for the selected date  0
The total number of vehicles recorded as over the speed limit for this date is  20
The total number of vehicles recorded through Elm Avenue/Rabbit Road junction is   52
The total number of vehicles recorded through Hanley Highway/Westway junction is 0
6%  of vehicles recorded through Elm Avenue/Rabbit Road are scooters.
The highest number of vehicles in an hour on Hanley Highway/Westway is  5
The most vehicles through Hanley Highway/Westway were recorded between  1:00 and 2:00
The number of hours of rain for date is  3

Text has been appended to file
Do you want to select another data file for a different date? Y/N > n
End of the run
Vehicle counts of data cleared.
>>
```