**Programming in Python Project Report**

**On**

**“Data Visualization (Bar Graph)”**

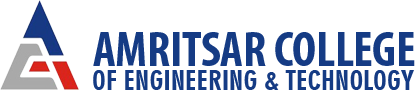
Submitted in the Partial fulfilment of the requirement for the Award of Degree of

**Bachelor of Technology**

**in**

**COMPUTER SCIENCE & ENGINEERING TECHNOLOGY**

**Batch**

**(2017-2021)**

|  |  |
| --- | --- |
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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**AMRITSAR GROUP OF COLLEGES, Amritsar**

**(Autonomous college under UGC Act – 1956[2(f) and 12(B)]**

**ACKNOWLEDGEMENT**

This is a humble effort to express our sincere gratitude towards those who have guided and helped us to complete this project

A project is major milestone during the study period of a student. As such this project was a challenge to us and was an opportunity to prove our caliber. We are highly grateful and obliged to each and everyone making us help out of problems being faced by us.

It would not have been possible to see through the undertaken project without the guidance of **Er. Neha Chadda.** It was purely on the basis of their experience and knowledge that we able to clear all the theoretical and technical hurdles during the development phases of this project work.

Last but not the least we are very thankful to our Head of Department **Er. Vinod Sharma** and all Members of Computer Science Department ,who gave us an opportunity to face real time problems while fulfilling need of an organization by making projects for them

**DECLARATION**

We hereby declare that the project work entitled **“First Come First Serve Scheduling algorithm(Non primptive)”** is an authentic record of our work carried out as requirements of Institutional Training project for the award of degree of B.Tech(CSE), **Amritsar Group Of Colleges, Amritsar,** under the guidance of Er. Sanjeev Kumar

(Signature of student)

**Aayush Khanna (1701214)**

**Basudev Mohato (1701244)**

**Gulmehak Kaur (1701237)**

Certified that the above statement made by the student is correct to the best of our knowledge and belief.

**Faculty Coordinator**

Er. Sanjeev Kumar (Associate Professor – CSE Department)

**INTRODUCTION TO PYTHON PROGRAMMING**

Python is a popular programming language.It was created by Guido Van Rossum, and was released in 1991.

**It is used for:**

* Web development(server-side)
* Software development
* Mathematics
* System scripting.

**Uses of Python:**

* Python can be used alongside software to create web applications.
* Python can be used alongside software to create workflows.
* Python can connect to database systems.
* It can also read and modify files.
* Python can be used to handle big data and perform complex mathematics.
* Python can be used for rapid prototyping,or for production-ready software development.

**Need of Python:**

* Python works on different platforms i.e. Windows, Mac, Linux, Raspberry Pi etc.
* Python has simple syntax similar to the English language.
* Python has syntax that allows developers to write programs with fewer lines than some other programming languages.
* Python runs on an interpreter system meaning that code can be executed as soon as it is written This means that prototyping can be very quick.
* Python can be treated in a procedural way, an object-orientated way or a functional way.

**Features of Python Programming Language:**

* **Readable:**Python is very readable language.
* **Easy to learn:**Learning python is easy as this is expressive and high level programming language , which means it is easy to understand the language and thus easy to learn.
* **Cross platform:**Python is available and can run on various operating systems such as Mac, Windows, Linux, UNIX etc. This makes it a cross platform and portable language.
* **Open Source: -**Python is a open source programming language.
* **Large standard Library: -**Python comes with a large standard library that has some handy codes and functions which we can use while writing code in Python.
* **Free: -**Python is free to download and use. This means you can download it for free and use it in your application. Python is an example of FLOSS (Free/Libre Open Source Software), which means you can freely distribute copies if this software, read its source code and modify it.
* **Advanced features:-**Supports generators and list comprehensions.

**Applications of Python Programming Language:**

* **Web Development: -**Web framework like Django and Flask are based on Python. Theyhelp you write server-side code which helps you manage database, write backend programming logic, mapping urls etc.
* **Machine Learning: -** There are many machine learning applications written in Python. Machine learning is a way to write a logic so that a machine can learn and solve a particular problem on its own.
* **Data Analysis: -**Data analysis and data visualisation in form of charts can also be developed using python.
* **Game Development: -** You can develop games using Python.
* **Desktop applications: -** You can develop desktop application in Python using library like Tkinter or QT.
* **GUI based desktop applications: -**Python is simple syntax, modular architecture, rich text processing tools and the ability to work on multiple operating systems which make it a desirable choice for developing desktop-based applications. There are various GUI toolkits like wxPython , PyQt or PyGtk available which help developers create highly functional Graphical User Interface(GUI).The various applications developed using Python includes:
  + - * + **Image Processing and Graphic Design Applications**
        + **Scientific and Computational Applications**
        + **Games**

**FLAVOURS OF PYTHON AND LANGUAGE USED:**

**IMPLEMENTATION LANGUAGE**

* CP PYTHON C
* JYTHON J AVA
* IRON PYTHON C#
* BRYTHON JAVA SCRIPT
* RUBY PYTHON RUBY

**INTRODUCTION TO PYTHON PROJECT:**

The name of project is “Difference between distances travelled by two cars using bar graph”.

**Objectives:**

The aim of project is to distinguish between the distance travelled by two different cars at different time intervals using bar graph.

**Platform Used:**

Latest version of PyCharm (2019) is used as a platform to build python project.

**Overview:**

The project is a bar graph of distance travelled by two different cars at particular time interval.

* The project contains following modules:-
* CSV module
* Tkinter
* Matplotlib
* Pandas
* Inputs given by the user is saved in CSV files.
* User input is taken by using input () function.
* For loop is used.
* Append function is used for adding any value in list
* Class is created and under it \_init\_ function is defined for making a login box.
* Super keyword is used.
* A login box appears before the execution of the project to take login username and password from the user.
* The graph is saved in the form of PDF in the location provided with the use of plt.savefig.(under matplotlib module).

**MODULE METHODS AND FUNCTIONS ETC THAT ARE USED TO CREATE PYTHON**

# Matplotlib:- Matplotlib is an amazing visualization library in python for 2D plots of arrays. Matplotlib is a multi-platform data visualization library buitlt on Numpy arrays and designed to work with the broader sciPy stack. It was introduced by John Hunter in year 2002. Matplotlib comes with a wide variety of plots helps to understand trende, patterns , and to make correlations. They ‘re typically instruments for reasoning about quantitative information.

* **Pandas: -**Pandas is an open source Python Library providing high-performance data manipulation and analysis tool using its powerful data structures. The name Pandas is derived from the word Panel Data – an Econometrics from Multidimensional data. Python with Pandas is used in a wide range of fields including academic and commercial domains including finance , economics , statistics , analytics etc.

Features of Pandas:

* Fast and efficient DataFrame object with default and customized indexing.
* Tools for loading data into in – memory data objects from different file formats.
* Data alignment and integrated handling of missing data.
* Reshaping and pivoting of date sets.
* Label-based slicing, indexing and subnetting of large data sets.
* Columns from a data structure can be deleted or inserted.
* High performance merging and joining of data.
* Time series functionality.
* **CSV file: -**The CSV module gives the python programmer the ability to parse CSV (Comma Separated Values) files. A CSV file is a human readable text file where each line has a number of fields, separated by commas or some other delimiter. The CSV format has no standard, but they are similar enough that the CSV module will be able to read the vast majority of CSV files. You can also write CSV files using the CSV module.
* **Reading from CSV file:**

There are two ways to read from a CSV file. You can sue the csv module’s readerfunction or you can use the DictReader class.

There are many websites that provide interesting information in CSV format.We will be using the World Health Organization’s (WHO) website to download some information on Tuberculosis.

* **Writing a CSV file:**

The CSV module also has two methods that you can use to write a CSV file.You can use to write a CSV file. We can use the write function or the DictWriter class.

The csvwriter function opens the path that we pass in and creates a csv writer object. The DictWriter class also support the writerows method, which we could have used instead of the loop.The CSV writer function supports this functionality.

* **Tkinter:-**Tkinter is python module used to create simple GUI apps. It is the most commonly used

Module for GUI apps in the Python.

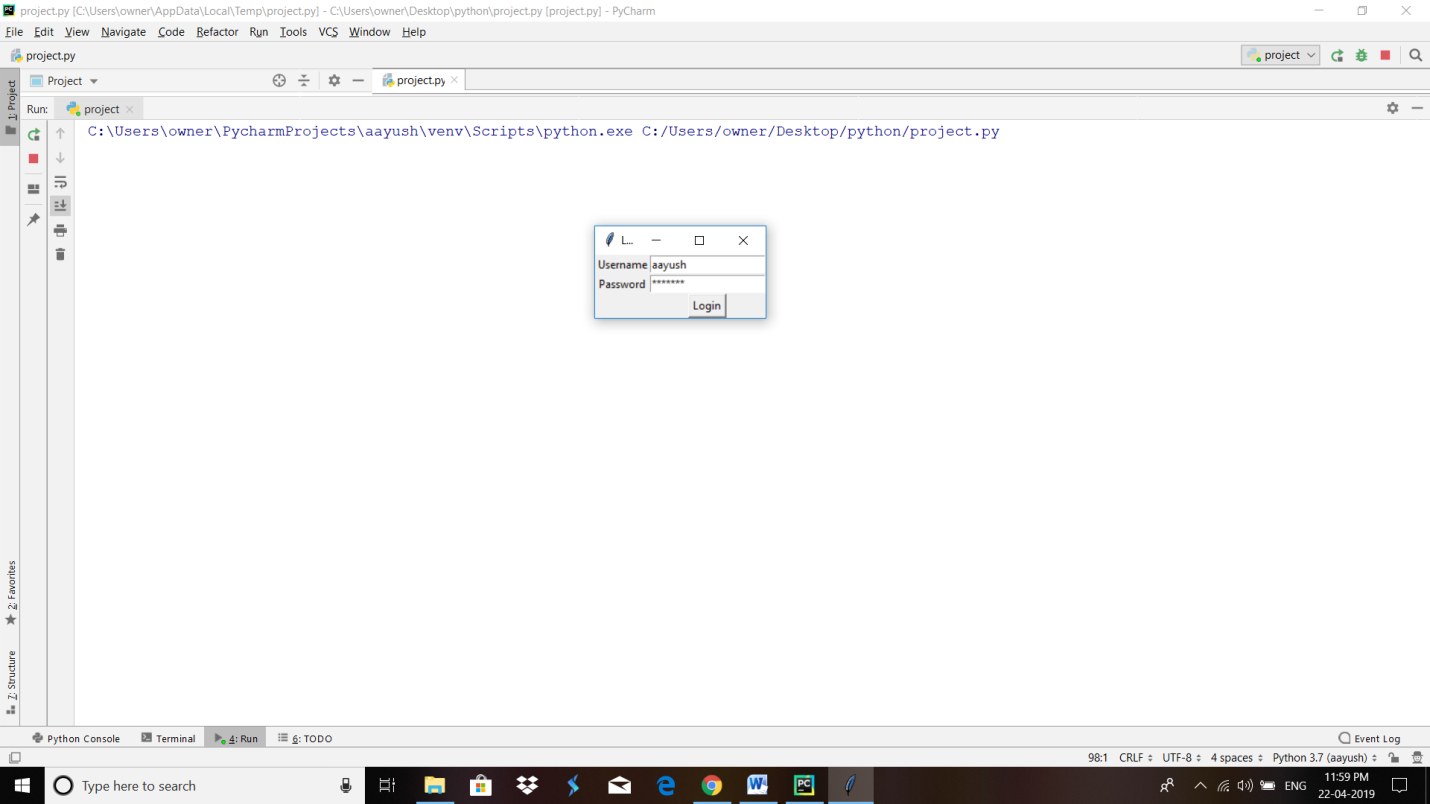
* **Button:-** It is used to place buttons in Tkinter.
* **Entry:**- It is used to create input fields in GUI.
* **Frame:**- It is used as containers in Tkinter.
* **Label :**- Label is used to create a single line widgets like text, images etc.

**CODING**

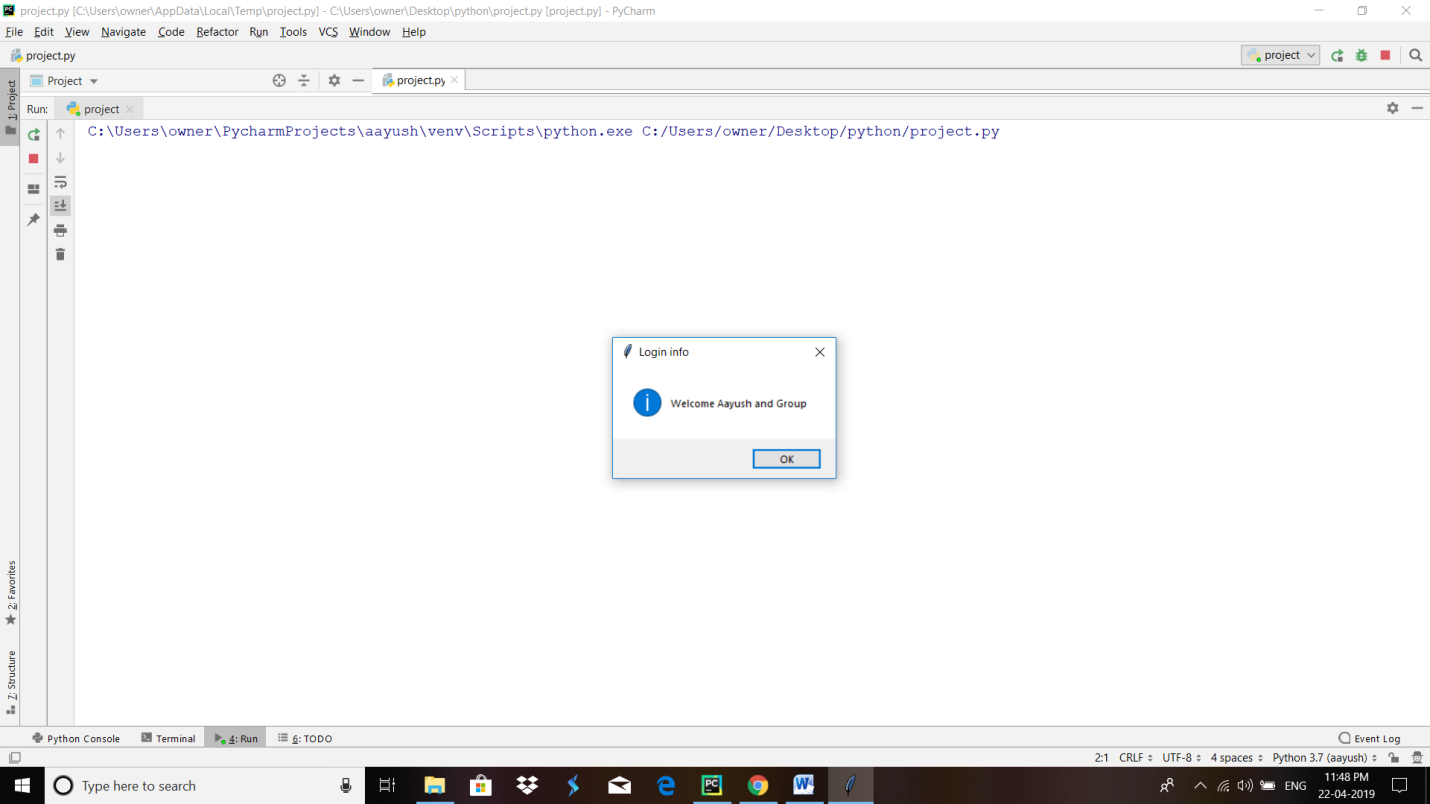
**from** tkinter **import** \*  
**import** tkinter.messagebox**as** tm  
**import** matplotlib.pyplot**as** plt  
**import** pandas **as** pd  
**class** LoginBox(Frame):  
**def**\_\_init\_\_(self,myself ):  
super().\_\_init\_\_(myself)  
  
self.label\_username = Label(self, text=**"Username"**)  
self.label\_password = Label(self, text=**"Password"**)  
  
self.entry\_username = Entry(self)  
self.entry\_password = Entry(self, show=**"\*"**)  
  
self.label\_username.grid(row=0, column=0)  
self.label\_password.grid(row=1, column=0)  
self.entry\_username.grid(row=0, column=1)  
self.entry\_password.grid(row=1, column=1)  
  
self.logbtn = Button(self, text=**"Login"**, command=self.\_login\_btn\_clicked)  
self.logbtn.grid(column=1)  
  
self.pack()  
  
**def**\_login\_btn\_clicked(self):  
 username = self.entry\_username.get()  
 password = self.entry\_password.get()  
  
  
**if** username == **"aayush" and** password == **"project"**:  
tm.showinfo(**"Login info"**, **"Welcome Aayush and Group"**)  
  
print(**"Enter Car Name: "**)  
 c1 = input(**"Enter first Car1: "**)  
 c2 = input(**"Enter second Car2: "**)  
 d = {}  
 l1 = []  
 l2 = []  
  
print(**"Now Enter Distance Travelled by two Cars After an Hour For 4 Hours: "**)  
print(**"Enter Distances for Car1: "**)  
**for** i **in** range(0, 4):  
 l1.append(int(input(**"Enter Distance After Hour:{} : "**.format(i + 1))))  
  
print(**"Enter Distances for Car2: "**)  
**for** i **in** range(0, 4):  
 l2.append(int(input(**"Enter Distance After Hour:{} :"**.format(i + 1))))  
  
t = [1, 2, 3, 4]  
  
 d[**'Car\_Name'**] = [c1, c2]  
 d[**'Total\_Distance\_Travelled'**] = [l1[3], l2[3]]  
  
 k = 0  
l3 = []  
 l4 = []  
l5 = [1, 2, 3, 4]  
 c3 = [c1, c2]  
 p = 0  
  
**for** i **in** range(0, 8):  
 l3.append(c3[k] + str(p + 1))  
**if** k == 0:  
 k = 1  
**elif**k == 1:  
 k = 0  
p = p + 1  
  
k = 0  
**for** i **in** range(0, 4):  
 l4.append(l1[k])  
 l4.append(l2[k])  
 k = k + 1  
  
df = pd.DataFrame(d, columns=[**'Car\_Name'**, **'Total\_Distance\_Travelled'**])  
  
df.to\_csv(**"car\_comparison.csv"**)  
df1 = pd.read\_csv(**"car\_comparison.csv"**)  
  
plt.figure(figsize=(20, 8))  
  
plt.bar(l3, l4, color=**"orange"**)  
  
plt.xlabel(**"Time\_Taken(IN HOURS[1-4])"**)  
plt.ylabel(**"Distance\_Travelled"**)  
plt.title(**"Distance\_Comparison\_Of\_Two\_Cars"**)  
 plt.savefig(**"C:/Users/owner/Desktop/python/bargraph.pdf"**,format=**"pdf"**)  
plt.show()  
  
**else**:  
tm.showerror(**"Login error"**, **"Incorrect information"**)  
  
  
root = Tk()  
lf = LoginBox(root)  
root.mainloop()

**SNAPSHOTS:-**

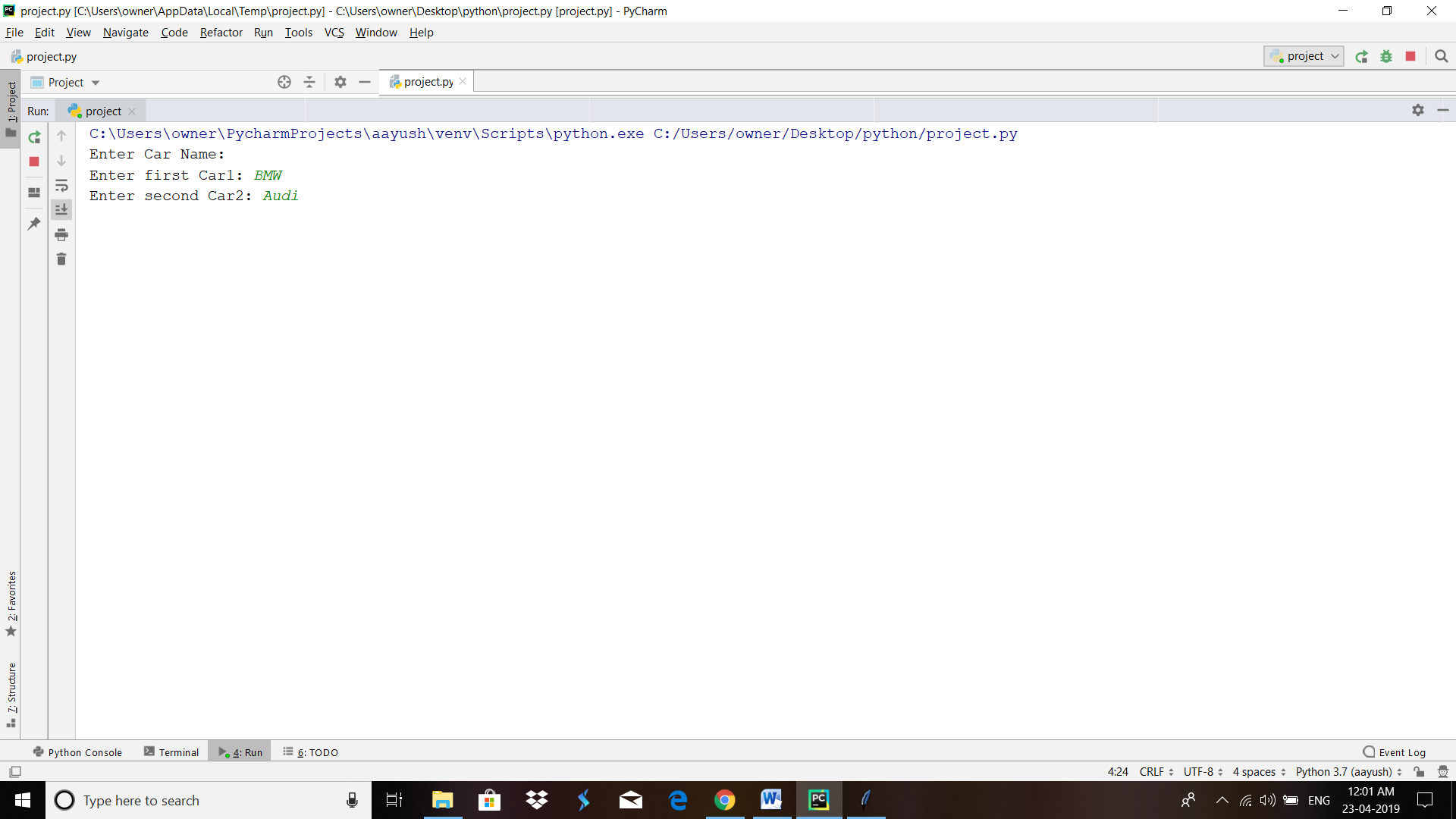
First of user need to fill the login box carefully:



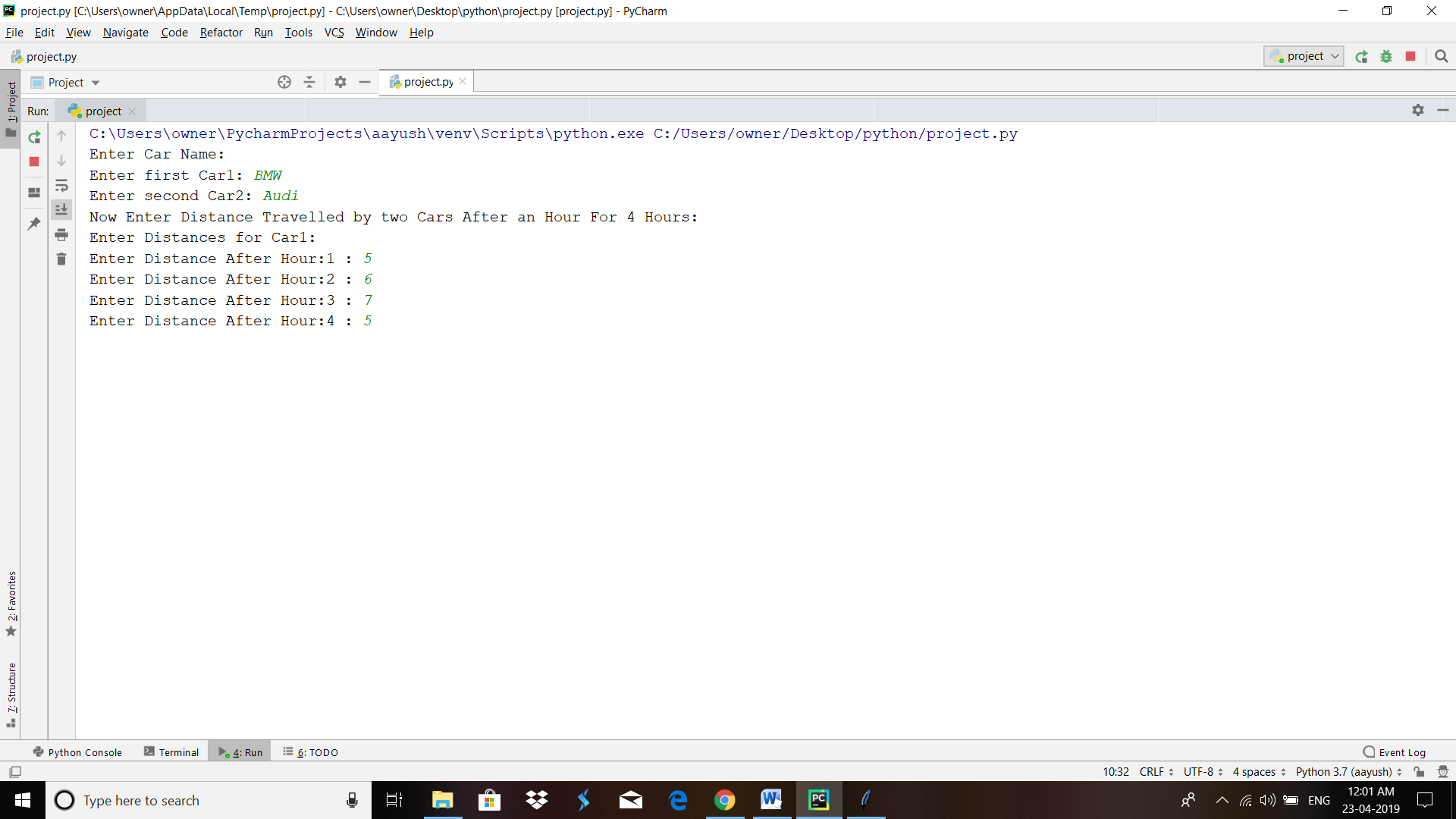
Welcome message:-



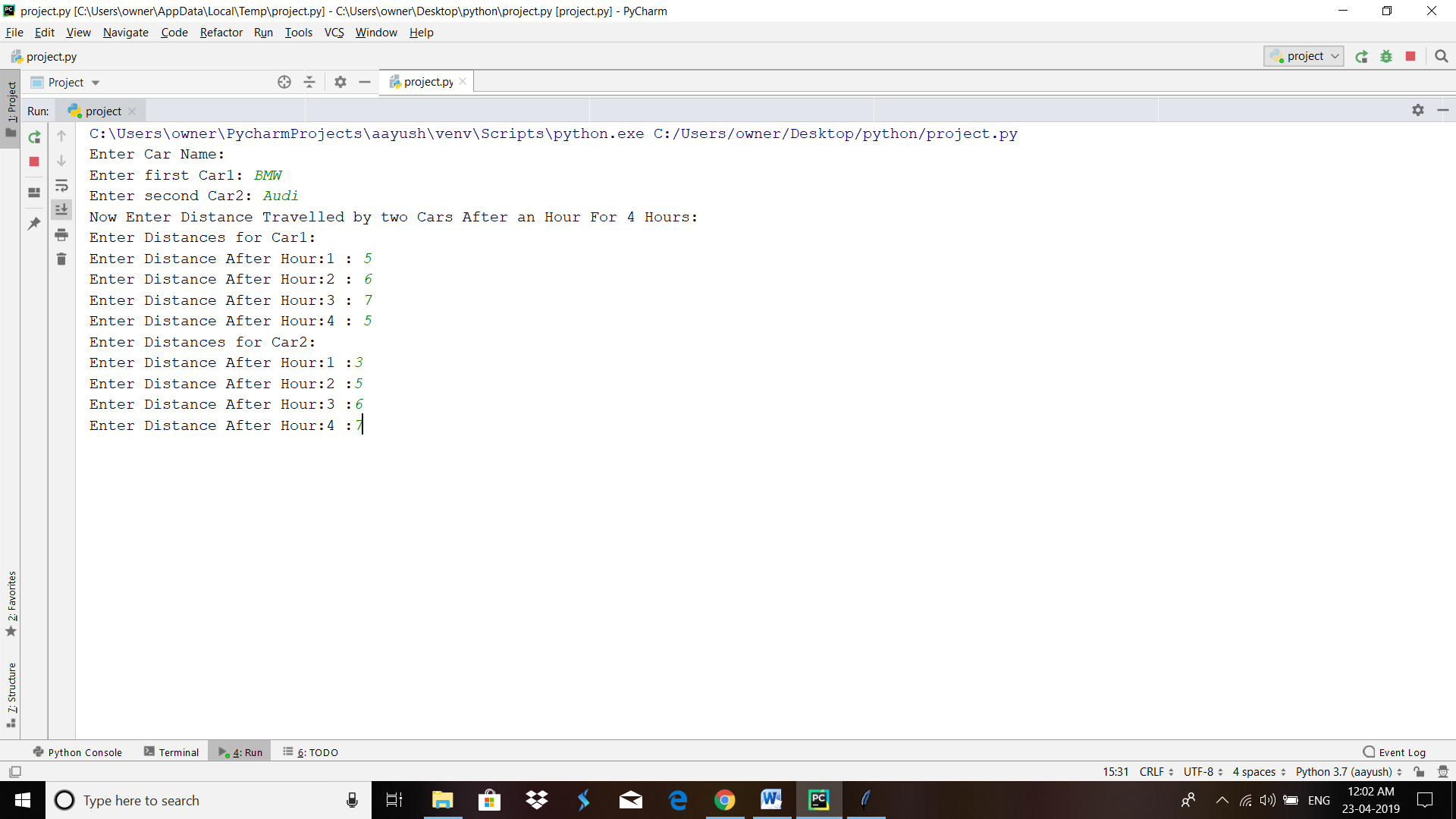
Enter name of both the cars:



Enter distance travelled by first car:



Enter distance travelled by second car:



Graph in the form of Pdf:

