

Data Analysis and Plotting using Python

SRS Report-I



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Mini Project Guide

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1. Introduction

This SRS document has been made as per the contents stated in the above table to acquaint the user about the various aspects of this project.

1.1 Purpose

The purpose of this SRS document is to provide comprehensive idea about the project developed by us in Python in which we would be developing a GUI-based application for analysing and plotting of datasets.

1.2 Scope

1. Importing datasets for the same in a particular frame of data.
2. Predicted data values and plotted graphs like bar-graph and pie-charts would be generated as the output of this application.
3. A limitation that this application would have is that it would not be able to predict or plot data if entered in a form which is different from the given format. The application developed as per this project can be used for plotting and predicting of data.

1.3 Definitions, Acronyms, and Abbreviations

1. Definitions :

Datasets: The data provided to plot and analyse by the user which will be imported by the application.

Matplotlib: Python library for plotting of data. Numpy: Python library for storing data in different forms and performing calculations on it using pre-defined functions. Scipy: Python library for manipulation of data using scientific methods. Pandas: Python library for predicting and analysis of data. Tkinter: Python library for developing GUI-based applications.

1.3 Overview

The rest of the SRS contains the remaining aspects of the project for better understanding of the project. It has been organised in the same manner that has been specified in the table of contents and it has been tried while making this SRS that it is easily comprehended by the user who might not be having a technical background.

2. General Description

The basic requirements of this project is that the host computer must have Python 3.x installed on it for working or executing this application along with some external libraries which are matplotlib, numpy, scipy, pandas and tkinter for the best performance to be delivered.

2.1 Product Functions

1. Plotting of Data : The most basic function of this software would be to plot the data imported in a particular format and plot it various graphs like bar-graph, pie-chart, which ever user decides and on which ever it is possible.
2. Predicting of Data: Another functions that this software would provide is the prediction of data using the datasets imported by it. It could be used to generate data values for future as per the past records in the datasets provided.

2.2 User Characteristics

The user using this software should be aware that the data he is importing into the software should be in the prescribed format only or else the software won't be able to handle the errors. The user must also be having basic knowledge of maths, statistics and computers for using this software. He/She must also be able to prepare a comprehensive textual report for the plotted graphs and predicted data values.

2.3 General Constraints

The general constraints of this software is that the datasets imported for plotting and predicting should be the same format as prescribed format given by the developer to the user after the completion of the projects as it can lead to fatal error in the execution of the software.

3. Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

The application would be given a GUI-based interface for the user to interact with the software, import datasets and select the type of graph they want to generate and prediction they want to make.

3.1.2 Hardware Interfaces

- Laptop with minimum 4 GB RAM.

3.1.3 Software Interfaces

- Python 3.x
- External Libraries: numpy, scipy, matplotlib, pandas and tkinter.
- MS Excel for CSV files.

3.2 Functional Requirements

3.2.1 Plotting of Data

3.2.1.1 Introduction: This function is to plot the imported data from datasets on various types of graphs as per the compatibility of the data.

3.2.1.2 Inputs: Datasets (as per the prescribed format by the developers)

3.2.1.3 Processing: application and processing using matplotlib and tkinter library of Python.

3.2.1.4 Outputs: Graphs are generated as per the user's requirement and data's compatibility.

3.2.2 Analysis and Prediction of Data

3.2.1.1 Introduction: This function is to analyse and predict future data that would be generated as per the given datasets.

3.2.1.2 Inputs: Datasets (as per the prescribed format by the developers) and prediction description.

3.2.1.3 Processing: using various external libraries of python such as pandas, numpy and scipy, complex calculations would be made and results would be generated.

3.2.1.4 Outputs: Values for future are generated as the output of this function.

3.3 Use Cases

3.3.1 Use Case # 1

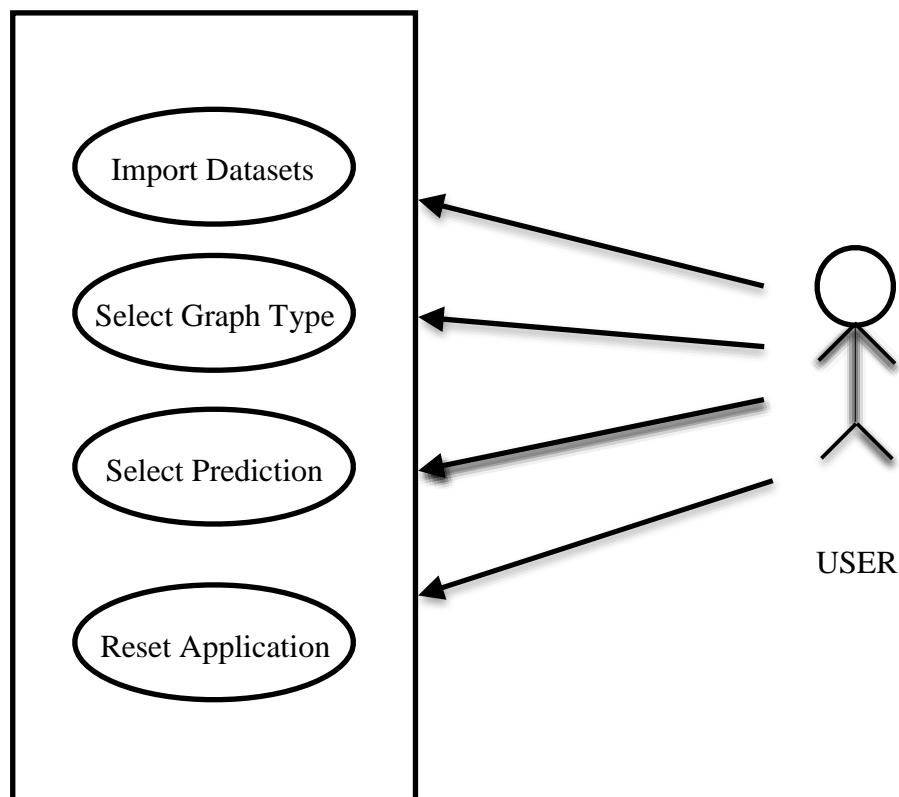


Fig. 1

3.5 Non-Functional Requirements

3.5.1 Performance

The system or the application should deliver its best performance at all times if the datasets imported for plotting or predicting are in the prescribed format as per the developers. It should not slow down or show any fatal errors at these instances, given that the hardware and OS are performing at their best.

3.5.2 Reliability

The application must be reliable as the graphs generated should be accurate and easily comprehensible even to the lay-men. They must be neatly presented by GUI for the user. The predicted data should be at least have an accuracy of 70% with precise outputs.

3.5.3 Availability

The application must have an all-time availability as it does not require anything specific like Internet connectivity for its performance.

3.5.4 Security

Due to no need of Internet connectivity, the application must be really secure and there should not be any sort of leakage of data during any point of operation.

3.5.5 Maintainability

The application is easily maintainable and its requires only updating the python version and the user needs to make sure that all the files of the entire software are kept in the same directories as they are kept initially by the developers.

3.5.6 Portability

The application has highly portable as the source can be easily copied from one place to another place and it only needs python 3.x and the external libraries to be installed on the host machine.

4. Analysis Model

4.1 Sequence Diagrams

4.1.1 Plotting Of Graph

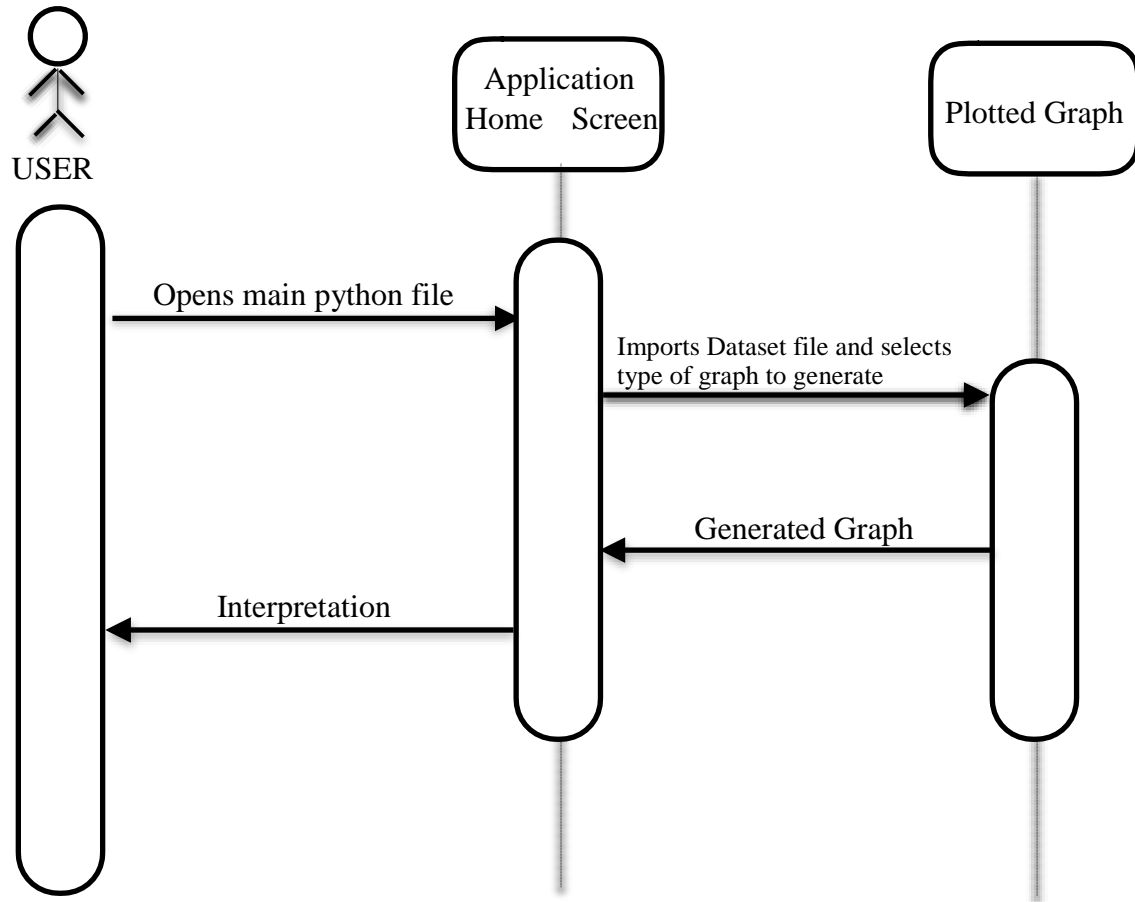


Fig 2.1

4.1.2 Analysis and Predicting of Data

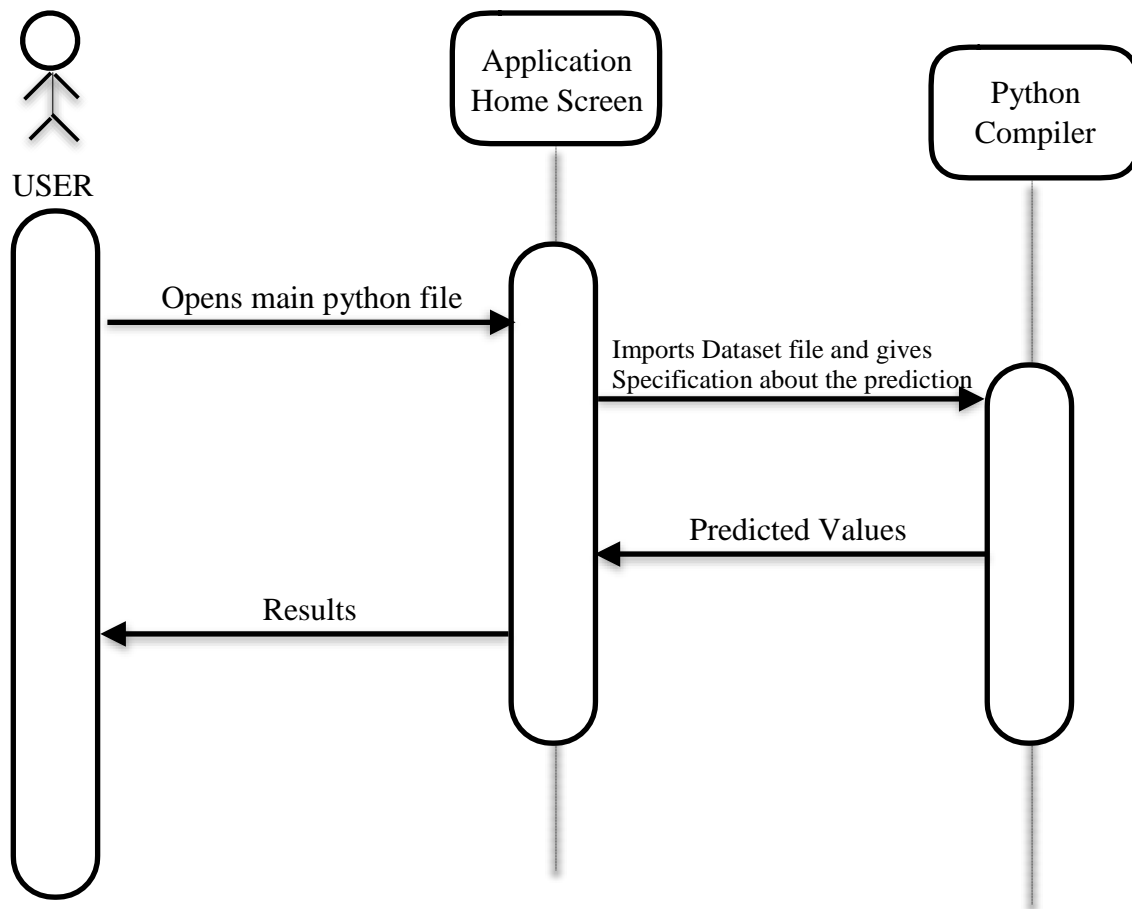


Fig 2.2

4.2 Data Flow Diagrams (DFD)

