DHOLE PATIL COLLEGE OF ENGINEERING,

WAGHOLI, PUNE-412207.

Accredited by NAAC with A+ Grade.

DEPARTMENT OF COMPUTER ENGINEERING

A
Project Report
On

"Student Result Analysis"

Submitted by

Mayur Bhogade (Exam Seat No)

Bhushan Deore (Exam Seat No)

Abhishek Mishra (Exam Seat No)

Omkar Sonawane (Exam Seat No)

Under the Guidance of

Prof.Nitesh Dangare

In partial fulfillment of

Bachelor's Degree

in

Computer Engineering

Academic Year 2019-2020

AT

Savitribai Phule Pune University, PUNE.

DHOLE PATIL COLLEGE OF ENGINEERING,
WAGHOLI, PUNE-412207.

CERTIFICATE

This is to certify that following students **Mayur Bhogade(Exam Seat No)**, **Bhushan Deore(Exam Seat No)**, **Abhishek Mishra(Exam Seat No)**,**Omkar Sonawane(Exam Seat No)**,is studying in T. E. Computer Engineering has successfully completed the Project titled "**Student Result Analysis** ". This study is a partial fulfillment of the degree of bachelor's of Engineering in Computer Engineering of the Savitribai Phule Pune University,Pune during the academic year 2019-2020.

Date : .....

Place : .....

Prof. Nitesh Dangare

Project Guide
Computer Engineering
DPCOE, Pune

Prof.Shrikant Dhamdhere

HOD
Computer Engineering
DPCOE, Pune

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I express our gratitude towards Project guide **Prof.Nitesh Dangare** and **Prof. Shrikant Dhamdhere** Head of Department of Computer Engineering, Dhole Patil College of Engineering, Pune who guided and encouraged us to completion of the project work within scheduled time.

I would like to thanks our Principal **Dr.Nihar Walimbe**, for providing us congenial environment to work in.

Mayur Bhogade **Roll No :**

Bhushan Deore **Roll No :**

Abhishek Mishra **Roll No:**

Omkar Sonawane **Roll No:**

ABSTRACT

The main objective of the project is to provide the examination result to the student in a simple way. This project is useful for students and institutions for getting the results in simple manner. By a result analyzer with subject status and marks is an application tool for displaying the results in secure way.

Present exam-marks calculations are mostly done manually on excels sheets.Using Report Analysis Automation will make the examination cell activities more efficient by wrapping the drawbacks of manual systems like accuracy, time, speed and simplicity.Result and analysis automation is a new concept which came into existence to reduce heavy burden on examination cell and it made analysis of results a monotonous task, apart from the large amount of data that is generated in a college for various branches of all semesters.

Student Result Analysis can be used by education institutes to maintain the records of students easily Achieving this objective is difficult using a maual system as the data is scattered, can be redundant and collecting relevant information may be very time-spending Finally this system will minimize the manual work, which leads to ease of generating reports, reducing confusions and increase in work rate effectively.

Key words: Python, Dataframes, Database server, Pycharm, CSV, Result, Pandas.

Contents

Chapter 1

INTRODUCTION

Examination cell otherwise known as exam cell is an innate part of any college management system. As we all are aware of the fact that examination is the vital and crucial issue in any engineering student's life. Hence, management of this system requires a lot of effort. The basic challenge of an institution is to carry out result analysis from each and every corner of the students performance, track and resolve various students issues before and after examination and manage the whole of these operations in a flawless manner and deliver quality result oriented education. If we just glance on a day to day basis, there are most basic problems faced by an institution. So to curb all these problems result analysis automation is used. This reduces much paper work and burden of storage. Also, it makes the task easier for the students, officials to access their result whenever required, if we share it on local network.

The "Student Result Analysis System" has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardships faced by this existing system. Moreover this system is designed for the particular need of the company to carry out operations in a smooth and effective manner.

Chapter 2

SYSTEM ANALYSIS

2.1 Proposed System

2.1.1Aim Of Project

The aim of the project is to provide the examination result to the student in a simple way. This project is useful for students and institutions for getting the results in simple manner. By a result analyzer with subject status and marks is an application tool for displaying the results in secure way. This project aims to bring in a centralized system to ensure that the activities of an examination can be effectively managed with less effort. This reduces the burden of file storage.

2.2 Project Module

This system modules are obtaining marks list, Database creation, Comparative analysis of marks, Graphical representation, Report of particular student

1. OBTAINING MARKS LIST
2. DATABASE CREATION
3. COMPARATIVE ANALYSIS OF MARKS
4. GRAPHICAL REPRESENTATION
5. REPORT OF PARTICULAR STUDENT

Chapter 3

LITERATURE SURVEY

This system describes the solution for a problem which occurred in existing manual system. The major problem in existing manual system is searching and updating of the student data. In recent studies, it is stated that the errors associated with the existing manual method of processing of students results in most universities in , make it not only desirable but imperative that computerized approach be used in measuring students progress. The manual methods being employed suffer a number of setbacks; they make the process to be time consuming and prone to error. They lead to examination results being published late, sometimes with wrong grades being entered and students GPAs being wrongly computed. This could lead to wrong conclusions in the awarding of class of degreealso view or edit their academic or personal details. Over the time the software based handling of results has proven to be a more effective way of result management.

Chapter 4

EXPERIMENTAL SETUP

The software packages used, as well as the languages employed in each one of them are as follows:

- Integrated Development Environment: Pycharm or Jupyter Notebook
- Software Devlopment Kit: Python
- Database: MySQL Server
- Database Connector: ODBC
- Operating System:Windows 7/8/10

4.1 Details of Software

4.1.1 Python Developmet Kit :

Python Programming Language is a high-level and interpreted programming language which was created by Guido Van Rossum in 1989. It was first released in 1991, which results in a great general purpose language capable of creating anything from desktop software to web applications and frameworks.

Python is a popular general-purpose programming language that can be used for a wide variety of applications. It includes high-level data structures, dynamic typing, dynamic binding, and many more features that make it as useful for complex application development as it is for scripting or "glue code" that connects components together. It can also be extended to make system calls to almost all operating systems and to run code written in C or C++. Due to its ubiquity and ability to run on nearly every system architecture, Python is a universal language found in a variety of different applications.

4.1.2 Pycharm :

PyCharm is an integrated development environment (IDE) used in computer programming, specifically for the Python language. It is developed by the Czech company JetBrains. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems (VCSes), and supports web development with Django as well as Data Science with Anaconda.

- Coding assistance and analysis, with code completion, syntax and error highlighting, linter integration, and quick fixes
- Project and code navigation: specialized project views, file structure views and quick jumping between files, classes, methods and usages
- Python refactoring: includes rename, extract method, introduce variable, introduce constant, pull up, push down and others
- Support for web frameworks: Django, web2py and Flask
- Integrated Python debugger
- Integrated unit testing, with line-by-line code coverage
- Google App Engine Python development
- Version control integration: unified user interface for Mercurial, Git, Subversion, Perforce and CVS with change lists and merge

4.1.3 MySQL Database :

MySQL is a fast, easy-to-use RDBMS being used for many small and big businesses. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company.

MySQL is becoming so popular because of many good reasons −

- MySQL is released under an open-source license. So you have nothing to pay to use it.
- MySQL is a very powerful program in its own right. It handles a large subset of the functionality of the most expensive and powerful database packages.
- MySQL uses a standard form of the well-known SQL data language.

- MySQL works on many operating systems and with many languages including PHP, PERL, C, C++, JAVA, etc.
- MySQL works very quickly and works well even with large data sets.
- MySQL is very friendly to PHP, the most appreciated language for web development.
- MySQL supports large databases, up to 50 million rows or more in a table. The default file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB).
- MySQL is customizable. The open-source GPL license allows programmers to modify the MySQL software to fit their own specific environments.

4.2 System Requirement:-

Hardware

- Processor : Intel Pentium and above
- RAM : 1 GB and above
- Monitor : 15” COLOR
- Hard Disk : 20 GB and above

Software

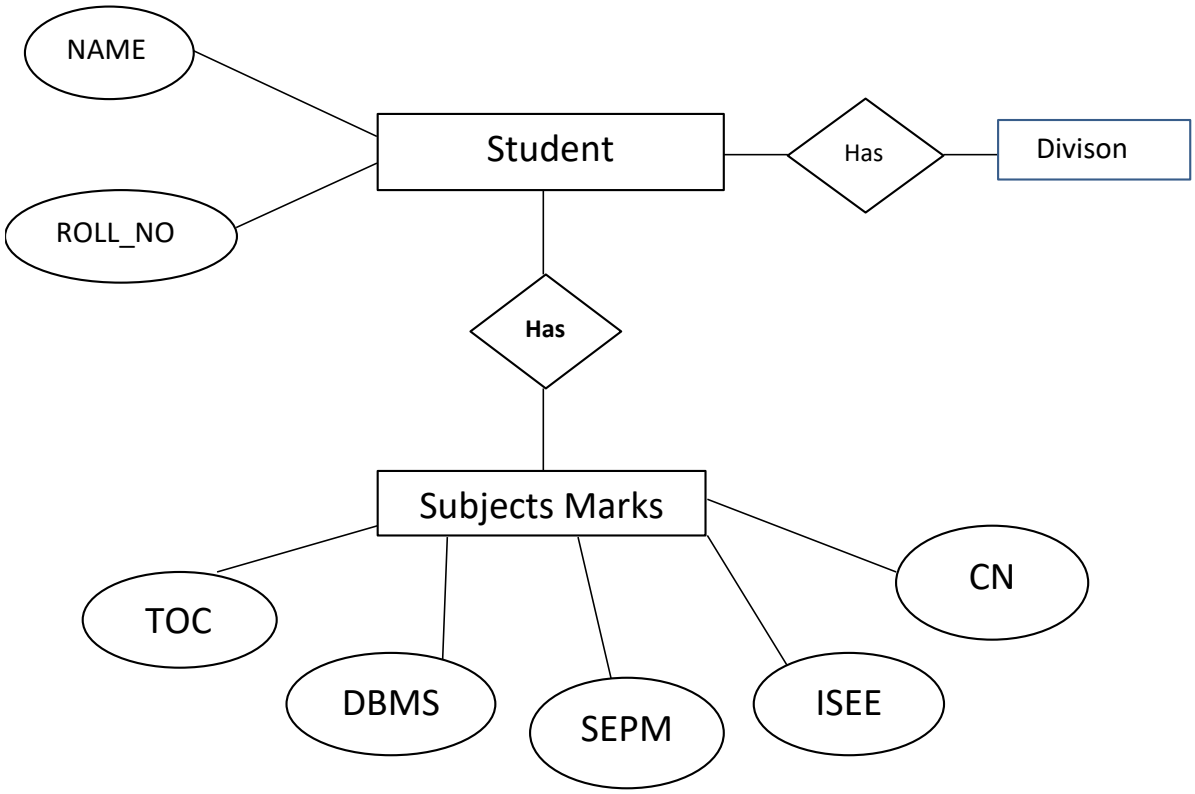
- IDE : Pycharm
- Software Devlopment Kit: Python
- Database: MySQL Server
- Database Connector: ODBC
- Operating System:Windows 7/8/10

Chapter 5

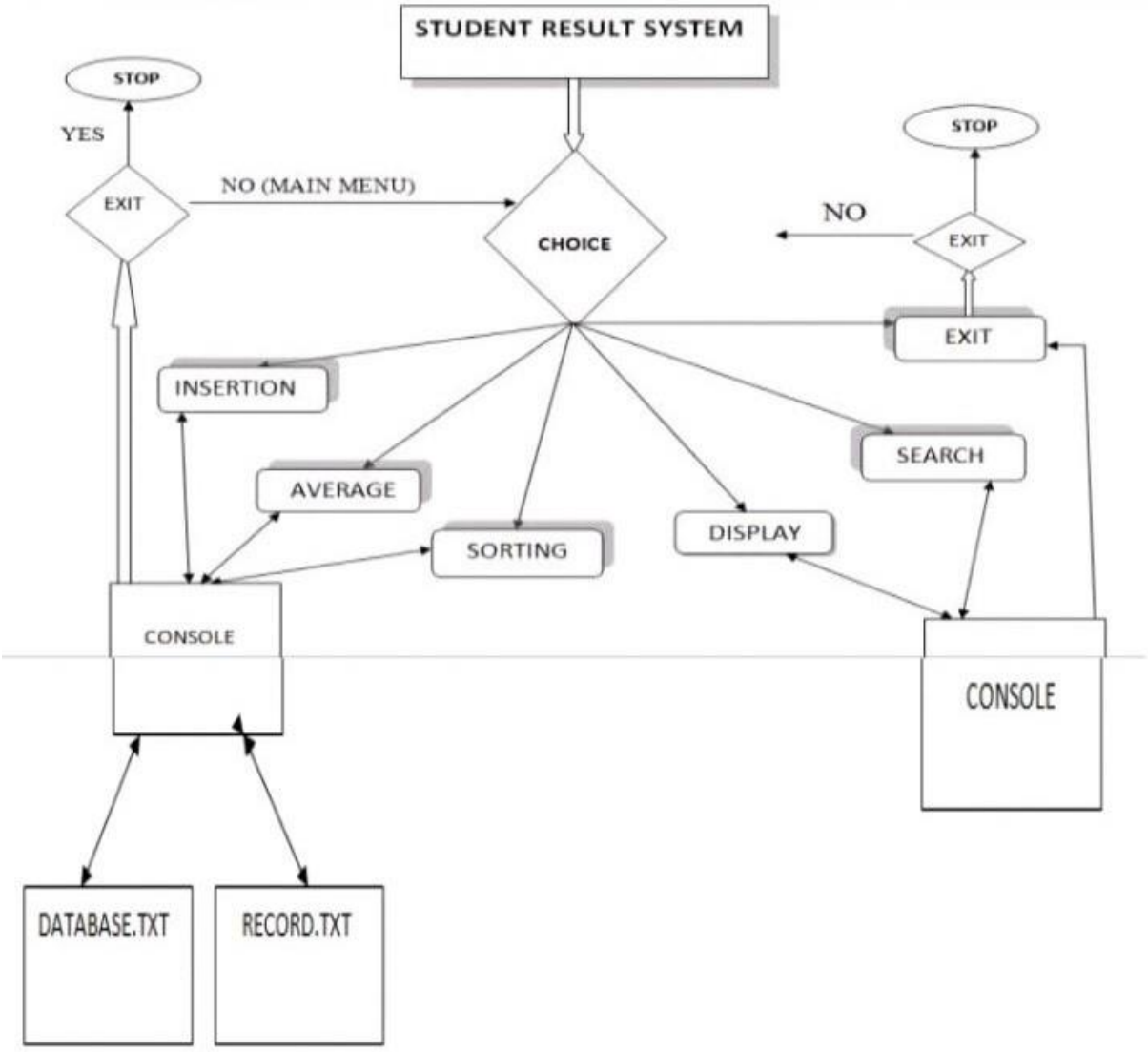
SYSTEM DESIGN

The software will have capability to maintain information about the students enrolled in the various courses, the marks obtained by the students in different subjects ,tracking academic progress of particular student. The software will also generate summary report regarding student marks, graphical analysis of marks and performance reports .

5.1 E-R Diagram Of Database :



5.2 Software Design :



Chapter 6

SYSTEM IMPLEMENTATION

6.1 Modular Description

Student Result Analysis can be used by education institutes to maintain the records of students easily Achieving this objective is difficult using a maual system as the data is scattered, can be redundant and collecting relevant information may be very time-spending Finally this system will minimize the manual work, which leads to ease of generating reports, reducing confusions and increase in work rate effectively.

This system modules are obtaining marks list, Database creation, Comparative analysis of marks, Graphical representation, Report of particular student.

1. Obtaining marks list
2. Database creation
3. Comparative analysis of marks
4. Graphical representation
5. Report of particular student

6.1.1 Obtaining Marks List

Importing data from excel sheet ,We take excel sheet as an input those are: Subject wise Student marks. Details are provide information like roll number, marks of each subject, and name of student. Here we are generating the report of overall performance of student for all subjects by considering there marks. We are maintaining all details according to divison of student. When user needed to find any record then there is need to get input as divison and
Roll no. This shows us complete list of students present for exam.

6.1.2 Database Creation

After the getting all data,it is stored into the database by cropping only required field of the imported data.Database student is created and tables for divison a and b are created and mark are inserted accordingly. A structure of imported sheet is totally different then database structure so it's required to select only required field from imported data.The data in database is used accordingly with the help of dataframes for performing various operations.

6.1.3 Comparative Analysis of Marks

As data is retrieved from database student, it is used for various comparative analysis of marks such as highest and lowest from any divison .also highest and lowest scores in particular subject. These multiple operations are performed using various library functions of pandas and numpy libraries.

6.1.4 Graphical Representation

Data can be well understood if it is in graphical form. Results which are organized in the form of graphs are easy to analyse and for getting output. Data which is stored in dataframes is used for plotting bar graph ,line graph, pie chart by using library functions of matplotlib
for creating systematic and proper analysis of subject-wise and divison-wise results.

6.1.5 Report for Particular Student

Result of particular student can be obtained by searching divison and roll no. of student.This result is attached with the graphical representation of marks in course subjects.For future refernce , report card of student along with graph is stored in PDF format.This feature helps to easily filter data and get desired outcomes.

6.2 Python Libraries included:

a) Numpy :

NumPy is a module for Python. The name is an acronym for "Numeric Python" or "Numerical Python. It is an extension module for Python, mostly written in C. This makes sure that the precompiled mathematical and numerical functions and functionalities of Numpy guarantee great execution speed.

Furthermore, NumPy enriches the programming language Python with powerful data structures, implementing multi-dimensional arrays and matrices. These data structures guarantee efficient calculations with matrices and arrays. The implementation is even aiming at huge matrices and arrays, better know under the heading of "big data". Besides that the module supplies a large library of high-level mathematical functions to operate on these matrices and arrays.

SciPy (Scientific Python) is often mentioned in the same breath with NumPy. SciPy needs Numpy, as it is based on the data structures of Numpy and furthermore its basic creation and manipulation functions. It extends the capabilities of NumPy with further useful functions for minimization, regression, Fourier-transformation and many others.

NumPy is a general-purpose array-processing package. It provides a high performance multidimensional array object, and tools for working with these arrays. It is the fundamental package for scientific computing with Python. It contains Various features including these important ones:

- A powerful N-dimensional array object
- Sophisticated (broadcasting) functions
- Tools for integrating C/C++ and Fortran code
- Useful linear algebra, Fourier transform, and random number capabilities

Besides its obvious scientific uses, NumPy can also be used as an efficient multi-dimensional container of generic data.

Arbitrary data-types can be defined using Numpy which allows NumPy to seamlessly and speedily integrate with a wide variety of databases.

NumPy is memory efficiency, meaning it can handle the vast amount of data more accessible than any other library. Besides, NumPy is very convenient to work with, especially for matrix multiplication and reshaping. On top of that, NumPy is fast. In fact, TensorFlow and Scikit learn to use NumPy array to compute the matrix multiplication in the back end.

b) Pandas :

Pandas is an opensource library that allows to you perform data manipulation in Python. Pandas library is built on top of Numpy, meaning Pandas needs Numpy to operate. Pandas provide an easy way to create, manipulate and wrangle the data. Pandas is also an elegant solution for time series data.

Data scientists use Pandas for its following advantages:

- Easily handles missing data
- It uses series for one-dimensional data structure and dataframe for multi-dimensional data structure
- It provides an efficient way to slice the data
- It provides a flexible way to merge, concatenate or reshape the data
- It includes a powerful time series tool to work with

In a nutshell, Pandas is a useful library in data analysis. It can be used to perform data manipulation and analysis. Pandas provide powerful and easy-to-use data structures, as well as the means to quickly perform operations on these structures.
Pandas is the most popular python library that is used for data analysis. It provides highly optimized performance with back-end source code is purely written in C or Python.
We can analyze data in pandas with:

1. **Series**
2. **DataFrames**

A data frame is a two-dimensional array, with labeled axes (rows and columns). A Data frame is a standard way to store data.
Data frame is well-known by statistician and other data practitioners. A data frame is a tabular data, with rows to store the information and columns to name the information.

A series is a one-dimensional data structure. It can have any data structure like integer, float, and string. It is useful when you want to perform computation or return a one-dimensional array. A series, by definition, cannot have multiple columns. For the latter case, please use the data frame structure.
Series has one parameters: -Data: can be a list, dictionary or scalar value

- A fast and efficient **DataFrame** object for data manipulation with integrated indexing;
- Tools for **reading and writing data** between in-memory data structures and different formats: CSV and text files, Microsoft Excel, SQL databases, and the fast HDF5 format;
- Intelligent **data alignment** and integrated handling of **missing data**: gain automatic label-based alignment in computations and easily manipulate messy data into an orderly form;
- Flexible **reshaping** and pivoting of data sets;
- Intelligent label-based **slicing**, **fancy indexing**, and **subsetting** of large data sets;

c) Matplotlib:

Matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms. Matplotlib can be used in Python scripts, the Python and IPython shells, the Jupyter notebook, web application servers, and four graphical user interface toolkits.

matplotlib.pyplot is a collection of command style functions that make matplotlib work like MATLAB. Each pyplot function makes some change to a figure: e.g., creates a figure, creates a plotting area in a figure, plots some lines in a plotting area, decorates the plot with labels, etc.
In matplotlib.pyplot various states are preserved across function calls, so that it keeps track of things like the current figure and plotting area, and the plotting functions are directed to the current axes (please note that "axes" here and in most places in the documentation refers to the *axes* part of a figure and not the strict mathematical term for more than one axis).

Here is the list of all the methods as they appeared.

- plot(x-axis values, y-axis values) — plots a simple line graph with x-axis values against y-axis values
- show() — displays the graph
- title("string") — set the title of the plot as specified by the string
- xlabel("string") — set the label for x-axis as specified by the string
- ylabel("string") — set the label for y-axis as specified by the string
- figure() — used to control a figure level attributes
- subplot(nrows, ncols, index) — Add a subplot to the current figure
- suptitle("string") — It adds a common title to the figure specified by the string
- subplots(nrows, ncols, figsize) — a convenient way to create subplots, in a single call. It returns a tuple of a figure and number of axes.
- set_title("string") — an axes level method used to set the title of subplots in a figure
- bar(categorical variables, values, color) — used to create vertical bar graphs
- barh(categorical variables, values, color) — used to create horizontal bar graphs
- legend(loc) — used to make legend of the graph

- xticks(index, categorical variables) — Get or set the current tick locations and labels of the x-axis
- pie(value, categorical variables) — used to create a pie chart
- scatter(x-axis values, y-axis values) — plots a scatter plot with x-axis values against y-axis values
- axes() — adds an axes to the current figure
- set_xlabel("string") — axes level method used to set the x-label of the plot specified as a string
- set_ylabel("string") — axes level method used to set the y-label of the plot specified as a string
- scatter3D(x-axis values, y-axis values) — plots a three-dimensional scatter plot with x-axis values against y-axis values
- plot3D(x-axis values, y-axis values) — plots a three-dimensional line graph with x-axis values against y-axis values

e) Context Manager :

In any programming language, the usage of resources like file operations or database connections is very common. But these resources are limited in supply. Therefore, the main problem lies in making sure to release these resources after usage. If they are not released then it will lead to resource leakage and may cause the system to either slow down or crash. It would be very helpful if user have a mechanism for the automatic setup and teardown of resources.In Python, it can be achieved by the usage of context managers which facilitate the proper handling of resources.

Suppose a block of code raises an exception or if it has a complex algorithm with multiple return paths, it becomes cumbersome to close a file in all the places. Generally in other languages when working with files *try-except-finall*y is used to ensure that the file resource is closed after usage even if there is an exception.Python provides an easy way to manage resources: *Context Managers*. The *with* keyword is

used. When it gets evaluated it should result in an object that performs context management. Context managers can be written using classes or functions(with decorators).

f) Inflect :

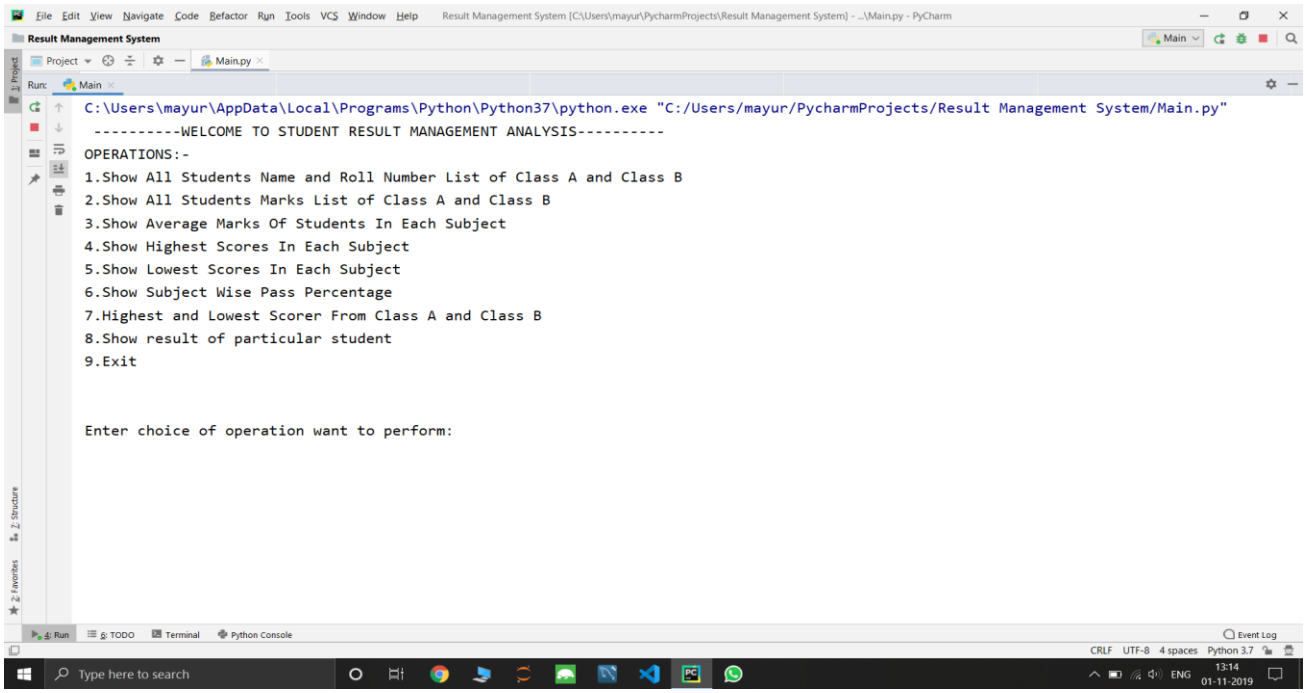
Inflection is a string transformation library. It singularizes and pluralizes English words, and transforms strings from CamelCase to underscored_string. Inflection is a port of Ruby on Rails' inflector to Python.

The inflect Python module correctly generates plurals, singular nouns, ordinals and indefinite articles. It can also convert numbers to words.

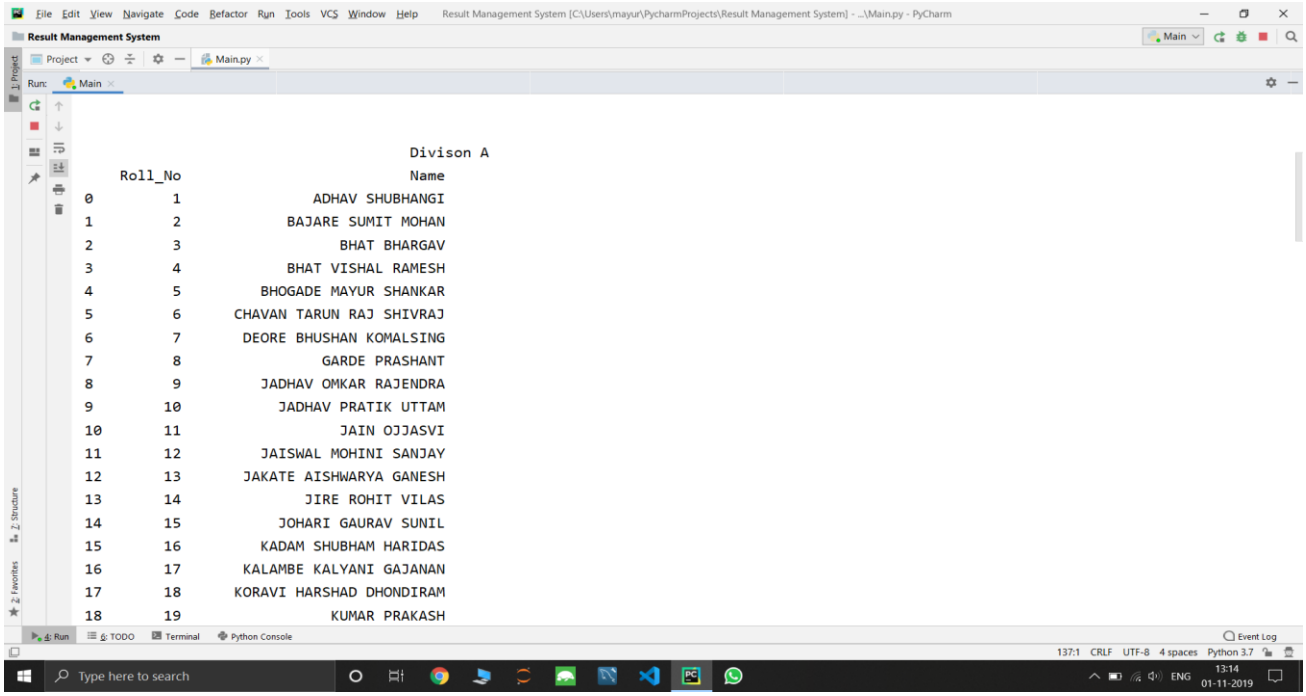
Chapter 7

SAMPLE OUTPUT

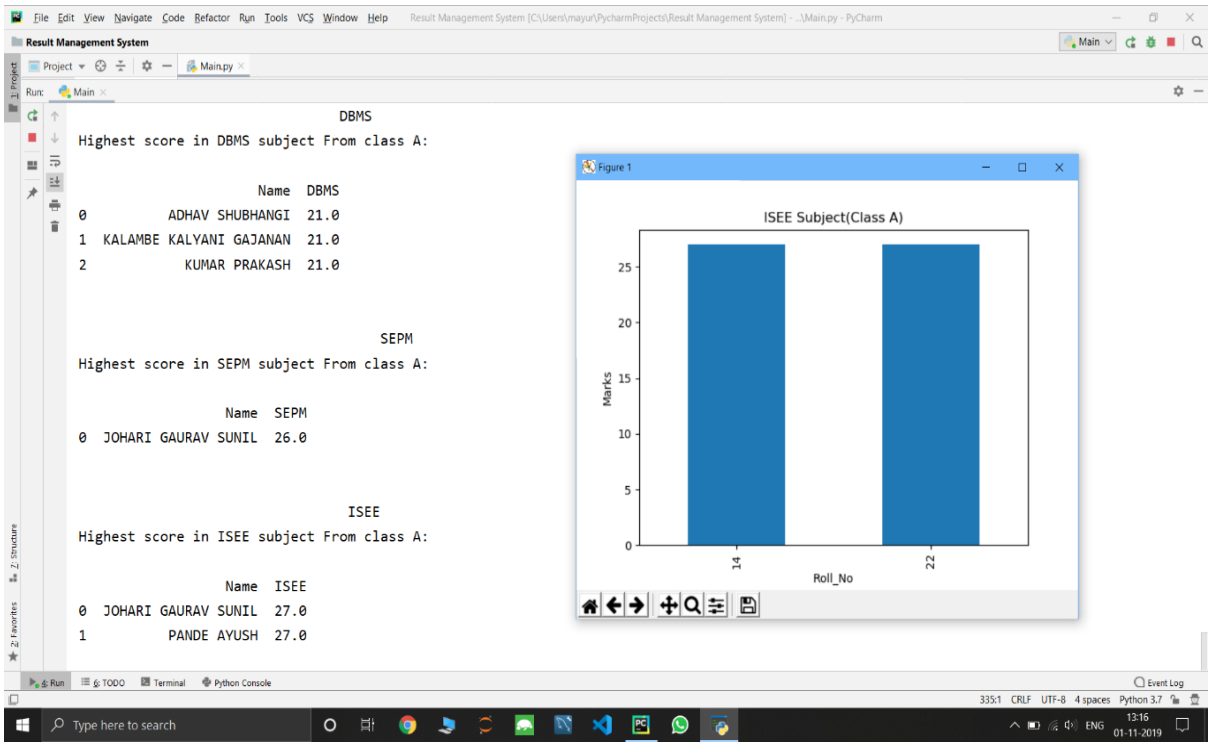
1) List of Operations :-



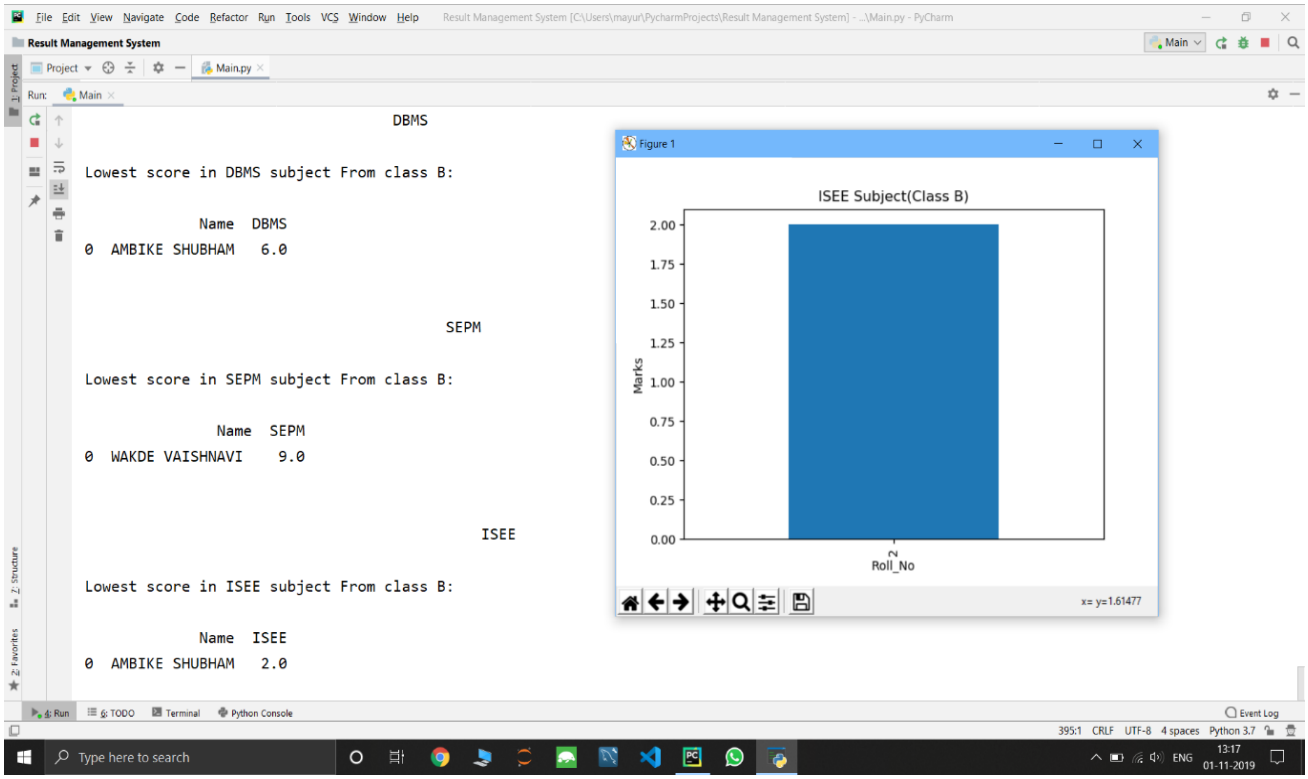
2) Students marks List :-



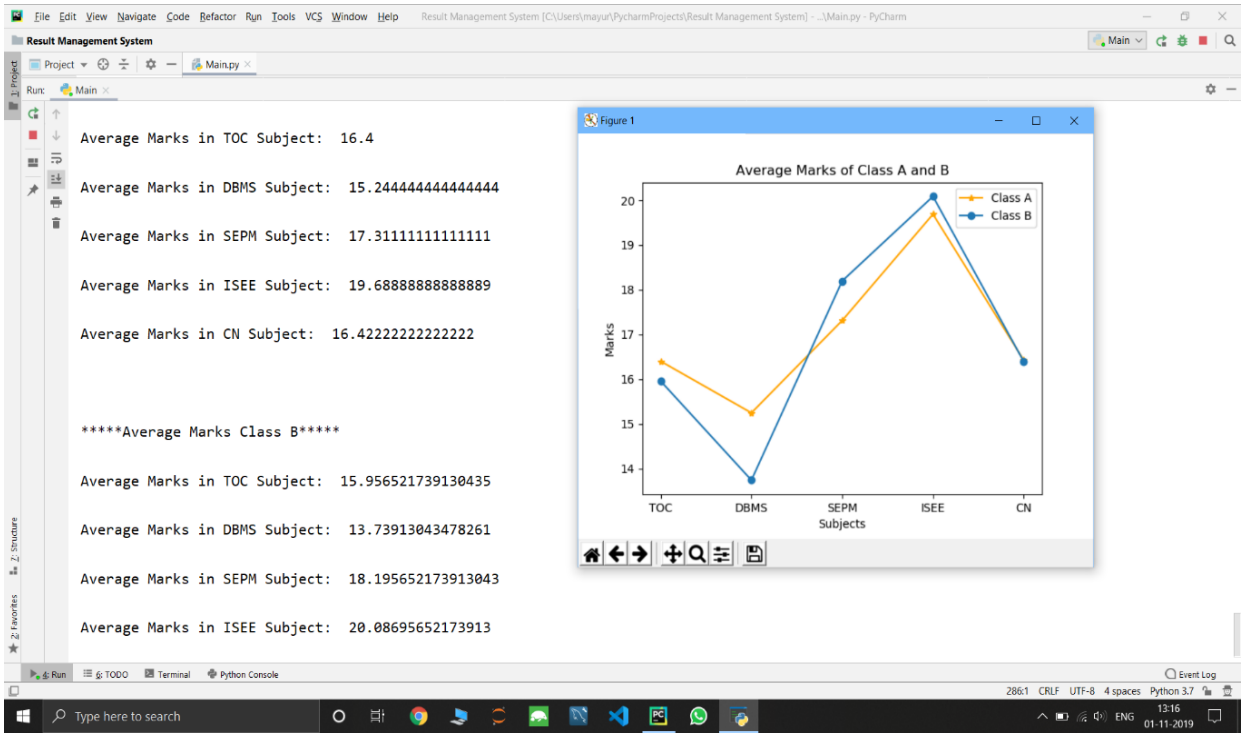
4) Highest Scores for each subject :-



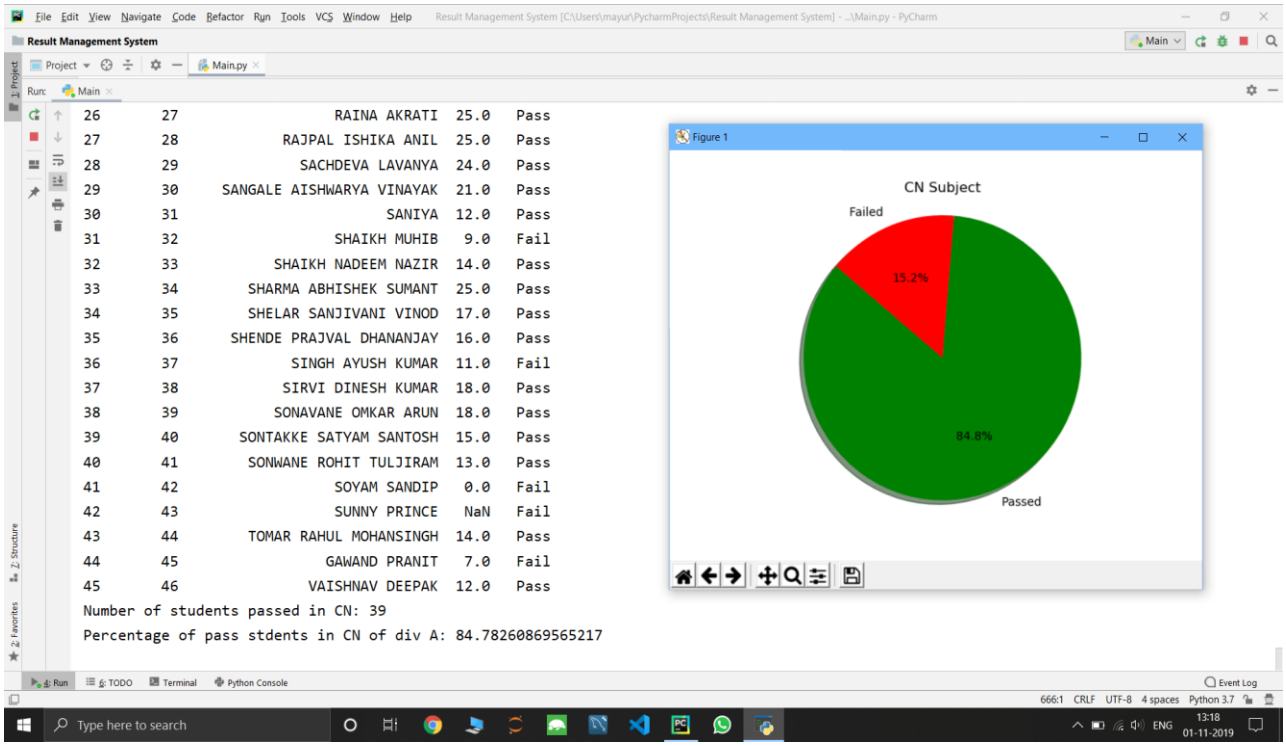
4) Lowest Scores for each subject :-



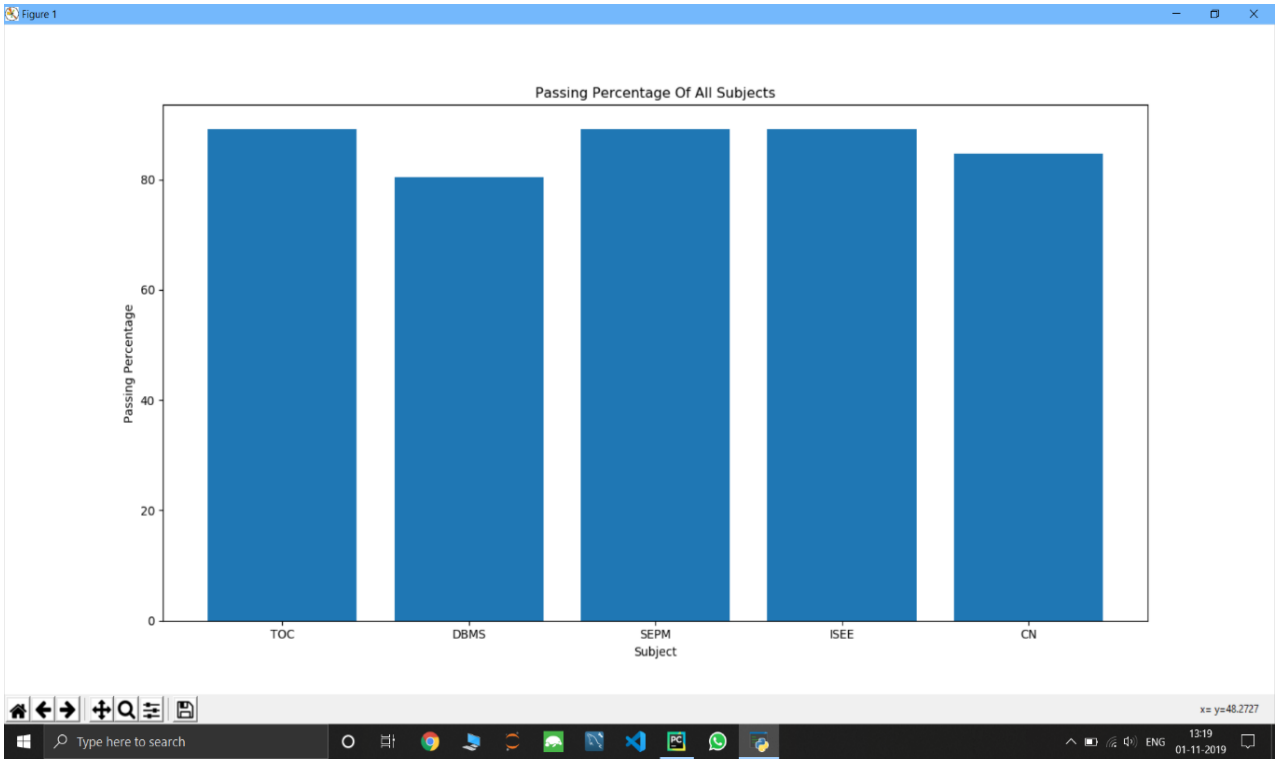
5) Average Marks of both divison :-



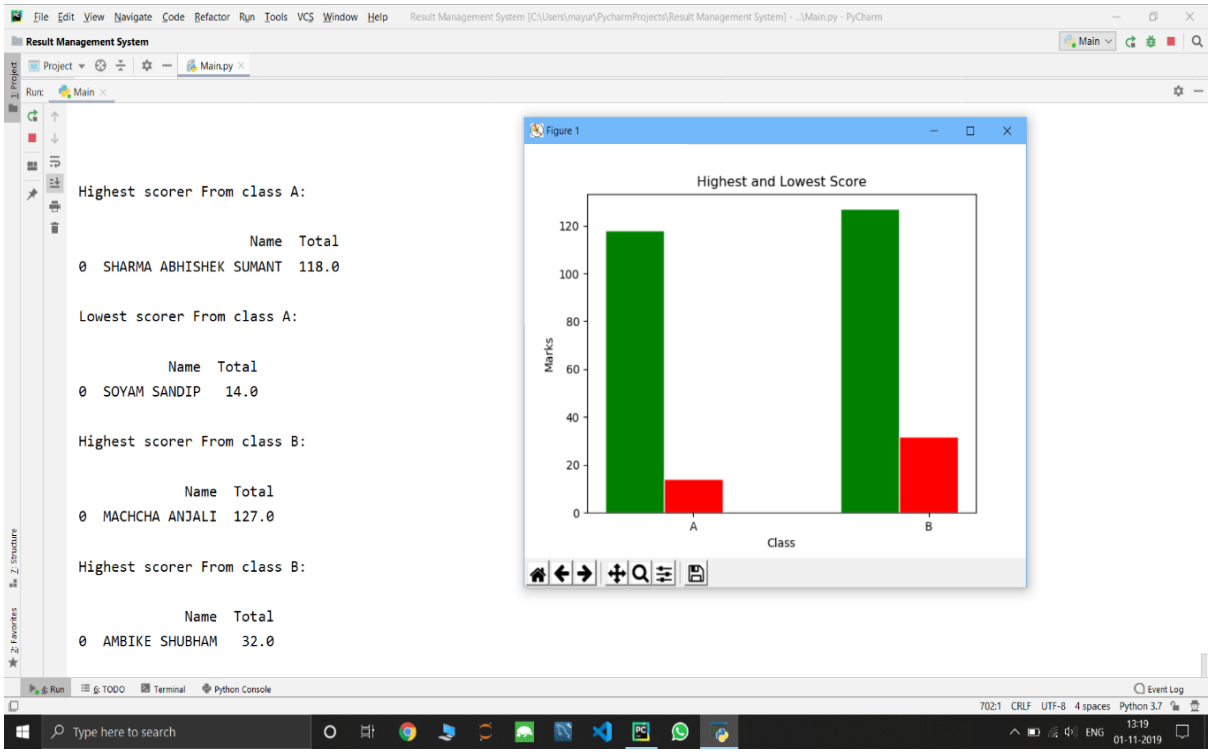
6) Subject -wise Passing Percentage :-



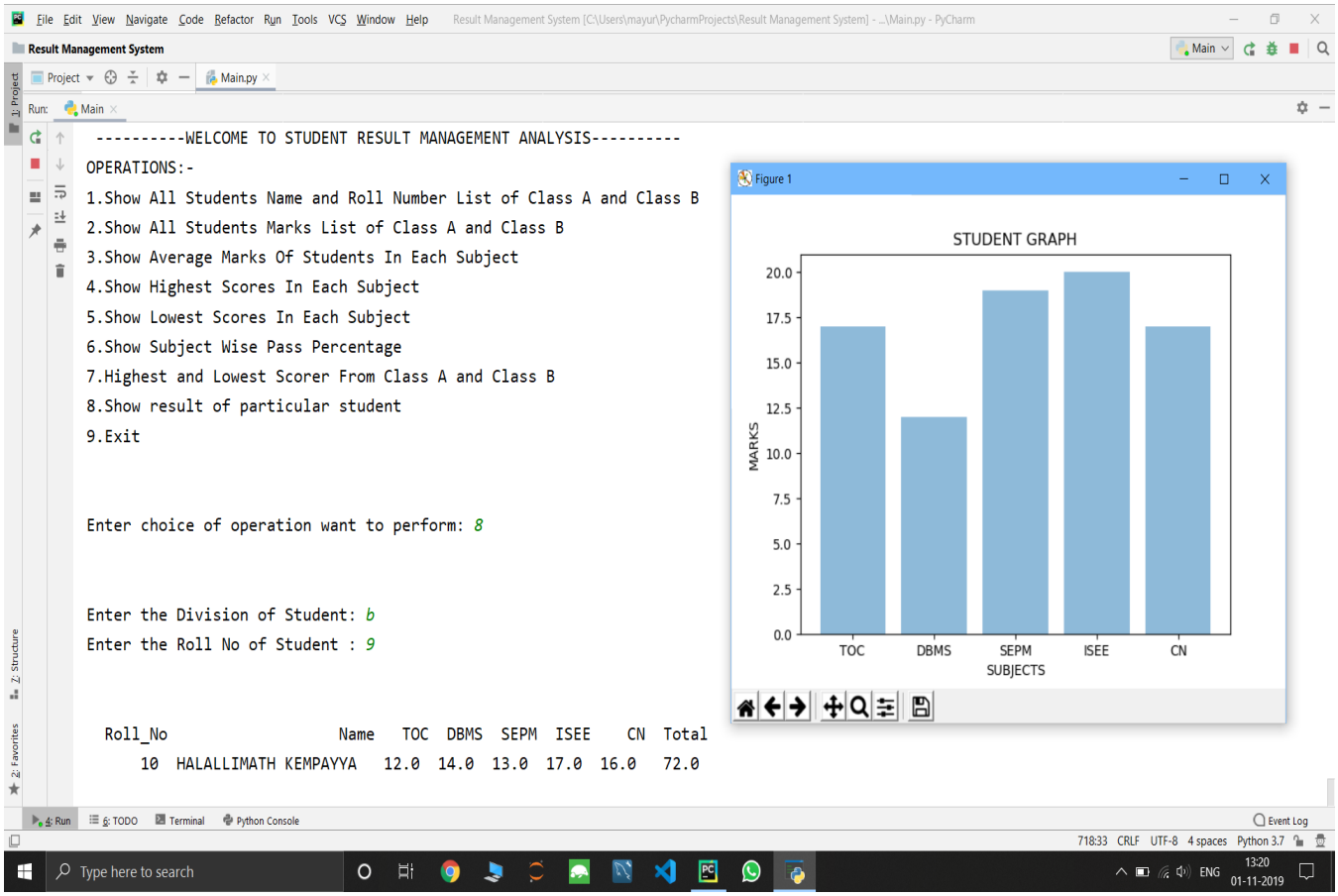
6) Divison-wise Passing Percentage :-



8) Highest and Lowest Scores In Total :-



9) Searching Result Of Particular Student :-



Chapter 8

CONCLUSION AND FUTURE ENHANCEMENT

Conclusion

The developed system can ensure us to reduce manual work, to provide efficient way of handling data. The ‘Result Analysis’ project can gurantee to manage data in efficient way and availing us desired output which is beneficial for future decisions and planning. Student Result Analysis can be used by education institutes to maintain the records of students easily Achieving this objective is difficult using a maual system as the data is scattered, can be redundant and collecting relevant information may be very time-spending Finally this system will minimize the manual work, which leads to ease of generating reports, reducing confusions and increase in work rate effectively.

The application is reduced as much as possible to avoid errors while entering the data. Student Result Analysis System , as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrate on the record keeping. Thus it will help organization in better utilization of resources.

.In future our project can be done as mobile applicaton. So that student can see their Progress report on their mobile.

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