A MINI PROJECT REPORT

ON

"PLACEMENT REGISTRATION AND ANALYSIS SYSTEM"

Submitted to

SAVITRIBAI PHULE PUNE UNIVERSITY

in completion of

SKILL DEVELOPMENT LABORATORY

(T.E Computer Engineering)

BY

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Anand Shah	Roll No: 305156

Sinhgad Institutes

Department of Computer Engineering

Sinhgad College of Engineering, Pune-41

Accredited by NAAC with grade 'A'

YEAR 2018-19

CERTIFICATE

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Acknowledgement

Every orientation work has an imprint of many people and it becomes our duty to express deep gratitude for the same.

During the entire duration of preparation for this Dissertation, we received endless help from a number of people and feel that this report would be incomplete if we do not convey our graceful thanks to them. This acknowledgement is a humble attempt to thanks all those who were involved in the project work and were of immense help to us.

First and foremost, we take the opportunity to extend our deep heartfelt gratitude to our guide **Prof. S. H. Sheikh**, for guiding us throughout the entire project and for his kind and valuable suggestions, without which this idea won't have executed. I also humbly thankful **Prof. M. P. Wankhade, Head of Department of Computer Engineering, SCOE, Pune** for his indispensable support, his priceless suggestions and for his valuable time. We would also like to take privilege in expressing our gratitude towards other teaching & non-teaching staff for their advice and kind cooperation.

We also thank our parents and all my colleagues for encouraging me with their valuable suggestions and motivating me from time to time. Finally, last but not the least, we would thank the almighty without whose care and blessing this work would have not been completed.

CONTENTS

List of Abbreviation

AMCAT	: Aspiring Minds Computer Adaptive Test
CSV	: Comma Separated Values
GEMS	: Governing Education Management System
GPA	: Grade Point Average
GUI	: Graphical User Interface
HTML	: Hypertext Markup Language
LR	: Logistic Regression
PDF	: Portable Document Format
PRAS	: Placement Registration and Analysis System
UI	: User Interface

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ABSTRACT

Each year, renowned companies come to our college to handpick students as per their requirement. A lot of human resources are at work in the process. Most of the data that is obtained during the process is not digitized and is rather stored as a hard copy format. The website known as 'GEMS' used for this process is not that transparent and isn't viable to perform analysis through it. So, our aim was to build a system that could unify all the work into a single entity known as PRAS (Placement Registration and Analysis System). The Company registration and Student registration can be performed using the system itself. The system digitizes all the data that will be collected during the placement process and will generate soft copies in order to process it further and also for reference. The system analyzes data and produces various graphs viz. Bar Graphs, Pie charts, Scatter plots. On the basis of your academic data, the system will decide whether you will get placed into a company or not.

1. INTRODUCTION

1.1. Introduction to PRAS

PRAS is a combination of different modules which include '**STUDENT**', '**COMPANY**' and '**PLACEMENT CELL**'. The modules communicate with each other to produce the desired outcomes. It offers registration for both companies and students. The combined data are generated in both HTML and PDF formats for future references.

1.2. Purpose

PRAS offers companies and students to register their details. Any student can choose to review the outcomes of getting placed on the basis of previous placement records, whereas the company can begin their placement process through the system. The Placement Cell can use various data visualization graphs to view the analysis produced throughout the process.

1.3. Problem Statement

1.3.1. Scope Statement

The scope of the project is to develop a system which combines all the different processes during placement processes. The features used in the system are described as follows:

1. Company Registration:

The companies can register through the system. Various information regarding name, minimum criteria, year, etc. The information is stored in CSV format and an eligibility list of students is generated.

2. Student Registration:

This module helps for students to register themselves into the process. The information obtained thus gets stored into CSV file format. The student, once after the details are filled can thereby review their chances of getting placed

3. Company Placement Process:

Every company gets the facility to begin placing students through the system. They can wish to place or not place the students as per the details displayed regarding the student.

4. Placement Analysis:

The placement cell can therefore, as the process goes on, can view data visualizations in the form of Bar plots, Pie charts, Scatter plots. The registered students as well as registered companies' details are available to refer in HTML and PDF format.

2. PROJECT PLANNING & MANAGEMENT

2.1. Software & Hardware Requirement

2.1.1. Hardware Requirement

- Laptop / PC

2.1.2. Software Requirement

- Python 3.6
- IntelliJ IDEA / PyCharm / IDLE
- Python packages required:
  - tkinter
  - sklearn
  - PIL
  - os
  - glob
  - pdfkit
  - matplotlib
  - pandas
  - numpy

2.2 Process Model

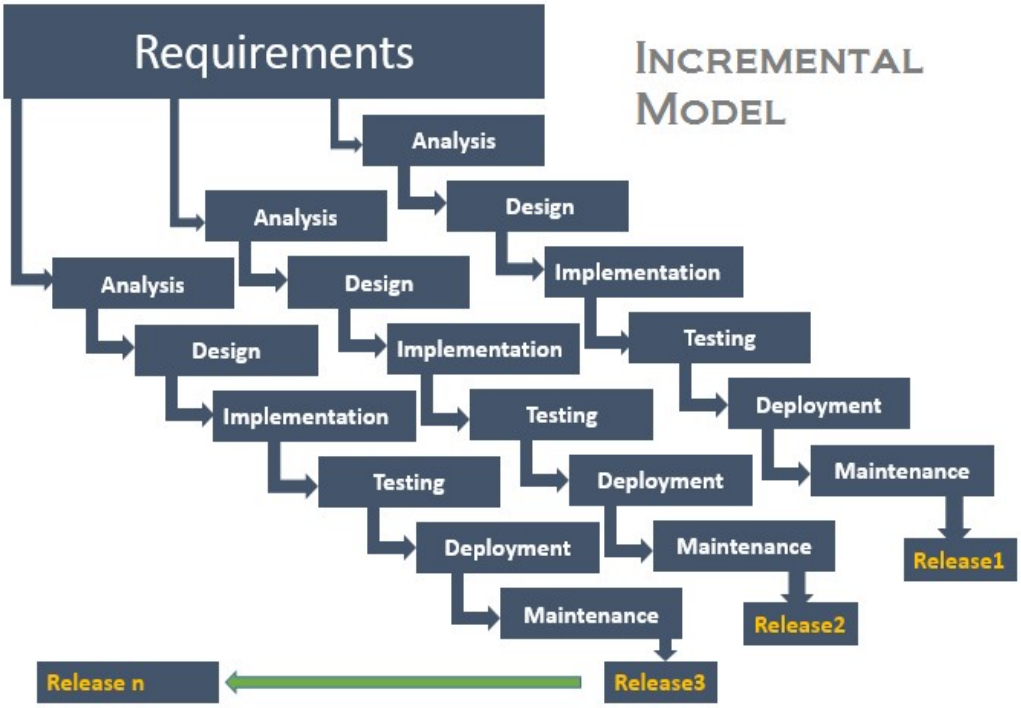

Fig 2.1 Incremental Process Model

Incremental process model was implemented while developing PRAS.

The incremental model combines elements of the linear sequential model with the iterative philosophy of prototyping. The incremental model applies linear sequences in a staggered fashion as calendar time progresses. Each linear sequence produces a deliverable increment of the software.

When an incremental model is used, the first increment is often a core product. That is, basic requirements are addressed, but many supplementary features (some known, others unknown) remain undelivered. The core product is used by the customer (or undergoes detailed review). As a result of use and/or evaluation, a plan is developed for the next increment. The plan addresses the medication of the core product to better meet the needs of the customer and the delivery of additional features and functionality. This process is repeated following the delivery of each increment, until the complete product is produced.

The incremental process model, like prototyping and other evolutionary approaches, is iterative in nature. But unlike prototyping, the incremental model focuses on the delivery of an operational product with each increment. Early increments are stripped down versions of the final product, but they do provide capability that serves the user and also provide a platform for evaluation by the user. Incremental development is particularly useful when staffing is unavailable for a complete implementation by the business deadline that has been established for the project. Early increments can be implemented with fewer people. If the core product is well received, then additional staff (if required) can be added to implement the next increment. In addition, increments can be planned to manage technical risks. For example, a major system might require the availability of new hardware that is under development and whose delivery date is uncertain. It might be possible to plan early increments in a way that avoids the use of this hardware, thereby enabling partial functionality to be delivered to end-users without inordinate delay.

While developing this project, in the first increment limited functionalities with a basic GUI was produced. Then the linear sequences would be applied for the development of each add-on feature. After feedback, the second increment basically consisted with changing the UI. And so on further changes were made. After completion of each linear sequence cycle, the product is delivered as an increment. During this process, the requirements are bound to change and hence the product so developed should be able to accommodate the changed requirements.

3. ANALYSIS & DESIGN

3.1 ER Diagram

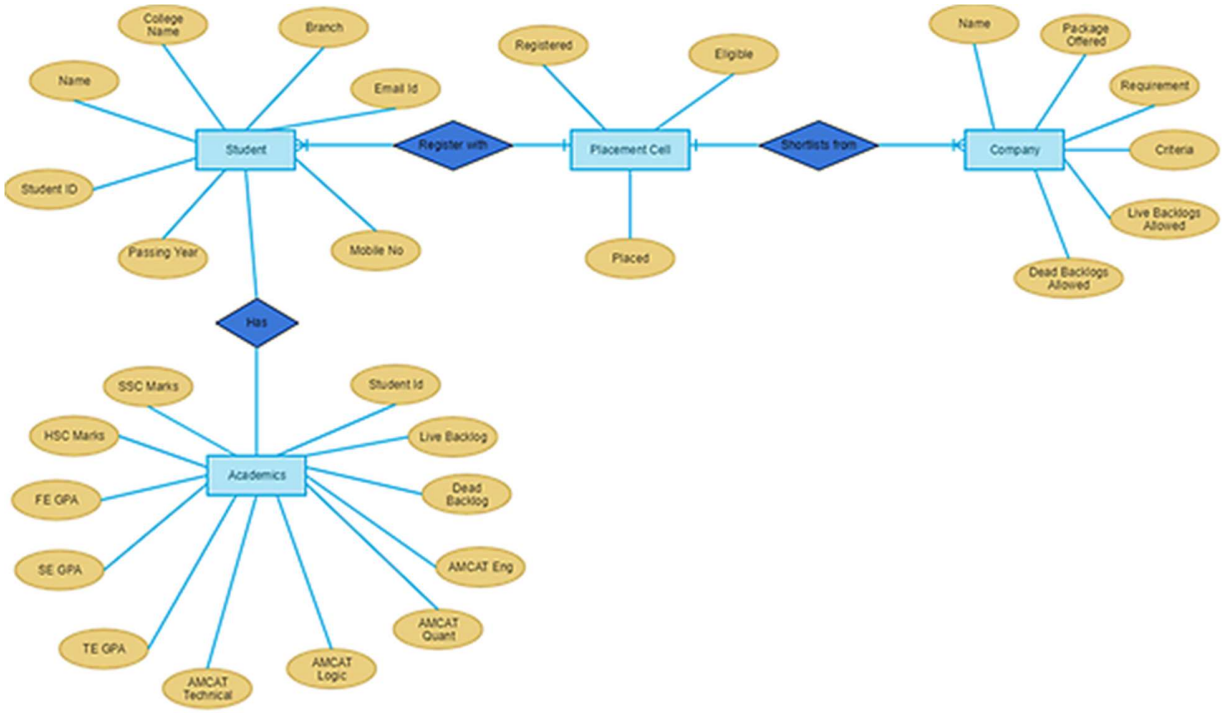

Fig 3.1 ER Diagram of PRAS

4. IMPLEMENTATION & CODING

4.1 Methodology

4.1.1 Logistic Regression

In PRAS, Logistic Regression is used for prediction of outcome, whether a student have chances of getting placed or not on the basis of previous placement records of the college.

LR is a statistical method for analyzing a dataset in which there are one or more independent variables that determine an outcome. The outcome is measured with a dichotomous variable (in which there are only two possible outcomes).

In PRAS, function used for dichotomous variable is **Sigmoid function**.

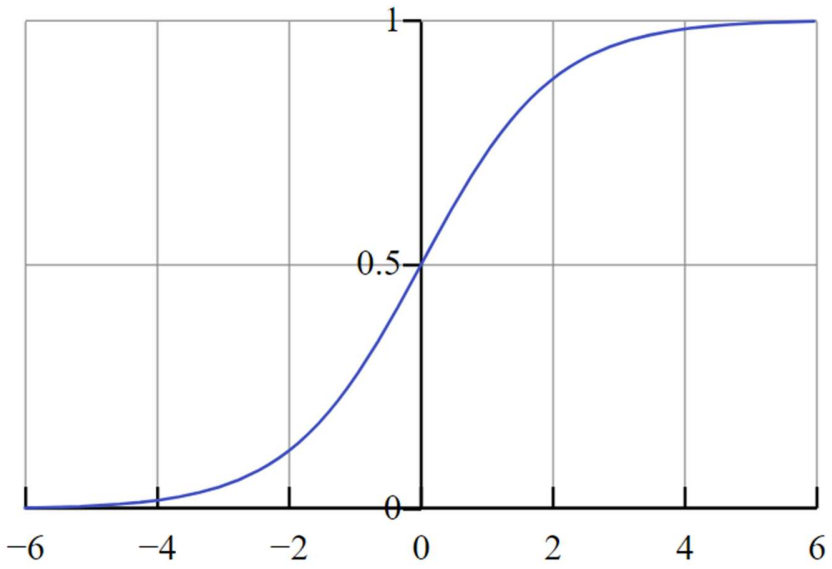

Fig 4.1 Sigmoid function curve

4.1.2 Data Visualization

Data visualization is a general term that describes any effort to help people understand the significance of data by placing it in a visual context. Patterns, trends and correlations that might go undetected in text-based data can be exposed and recognized easier with data visualization software.

In PRAS, Data visualization is used for observing different patterns in placement process of different companies on different group of students.

4.1.3 Documentation

Documentation is also a tedious work for placement cell. To maintain records that provides official information or evidence of placement takes a lot of time. Shortlisting students according to different eligibility criteria also take time.

PRAS takes care of this situation and generate all the records automatically and update all pdf and html generated instantly. Students are also shortlisted for different companies as soon as they register and provide their eligibility criteria.

4.2 Algorithm

1. Open Login Page
2. If new student, enter student user id and password
    a. Enter student details and click submit
    b. Click yes to predict outcome, no to skip
    c. Click yes to register a new student again
        i. Click no to quit.
3. If new company, enter company user id and password
    a. Click yes to register new company, no to skip
        i. Enter new company details to register
    b. Click yes to start placement process
        i. Select shortlisted file of students
        ii. Do placement process
        iii. When done, quit.
4. If placement cell, enter placement cell user id and password
    a. Select which type of graph you want to see from given options
    b. Select the data of companies, you want to perform analysis on.
    c. Close the graph after reviewing it.
    d. To perform other analysis, repeat from step 4.a.
    e. When done, quit.

4.3 GUI Design

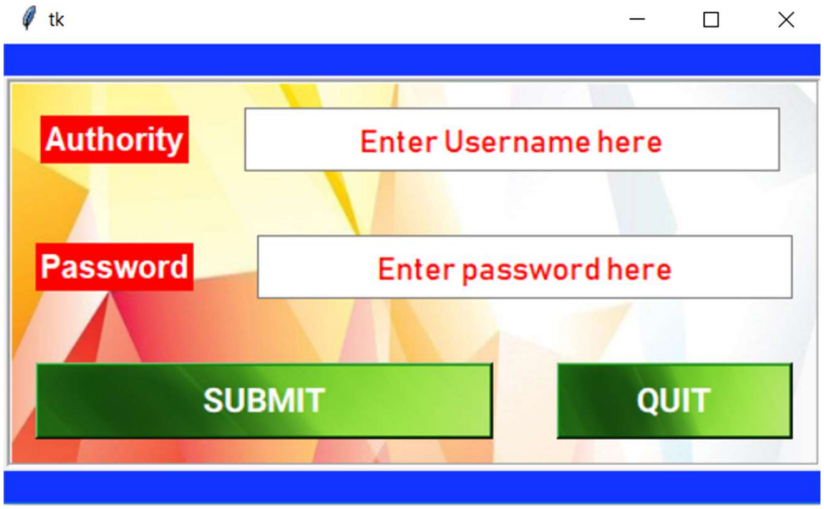

Fig 4.2 PRAS Login

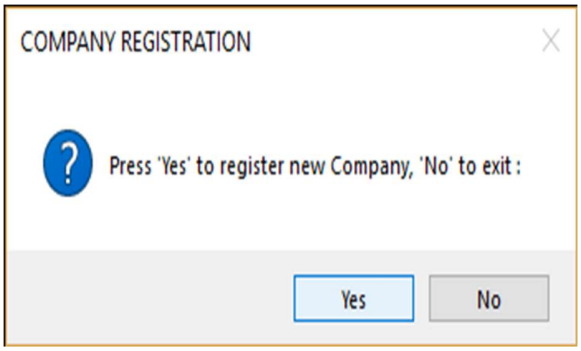

Fig 4.3 New company registration pop-up

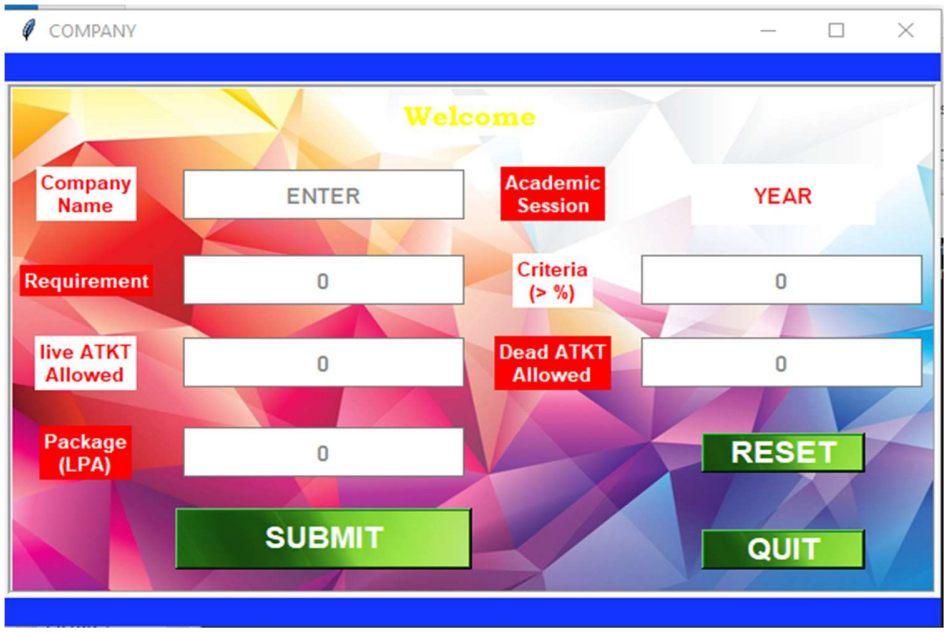

Fig 4.4 Company registration form

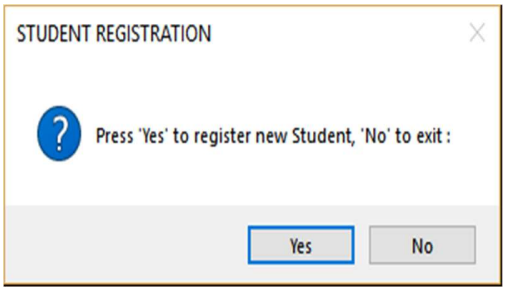

Fig 4.5 New Student Registration pop-up

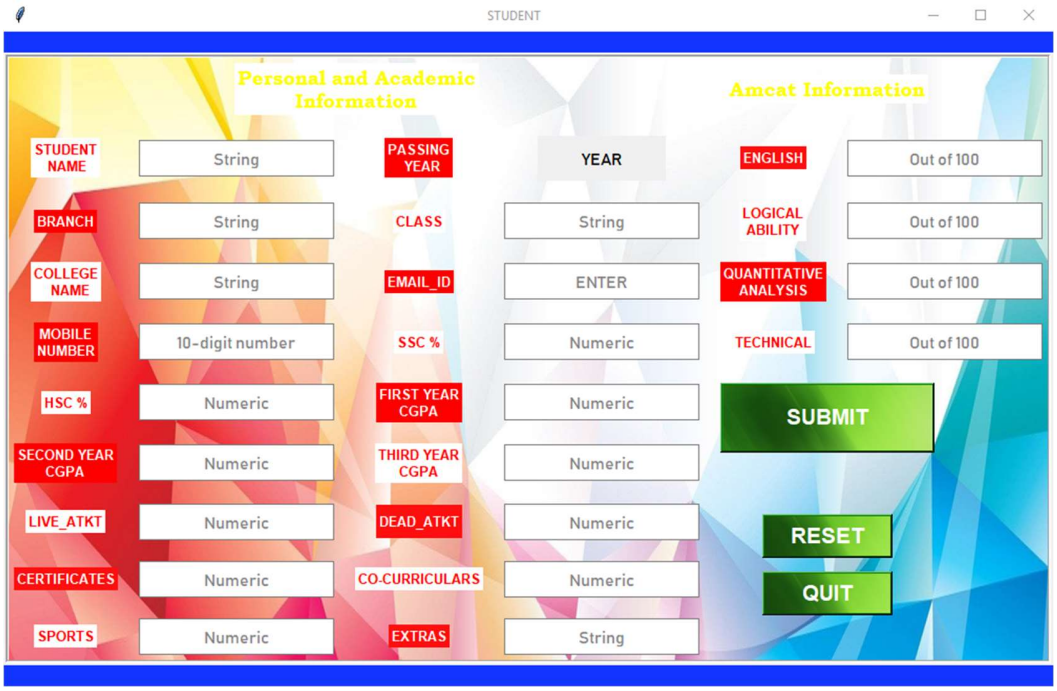

Fig 4.6 Student Registration form

Fig 4.7 Placement Cell Analysis Page

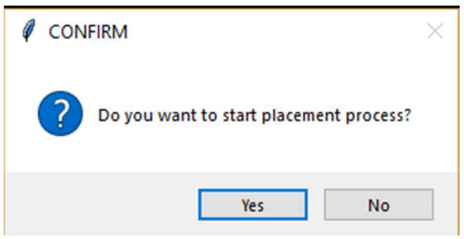

Fig 4.8 Starting placement process pop-up

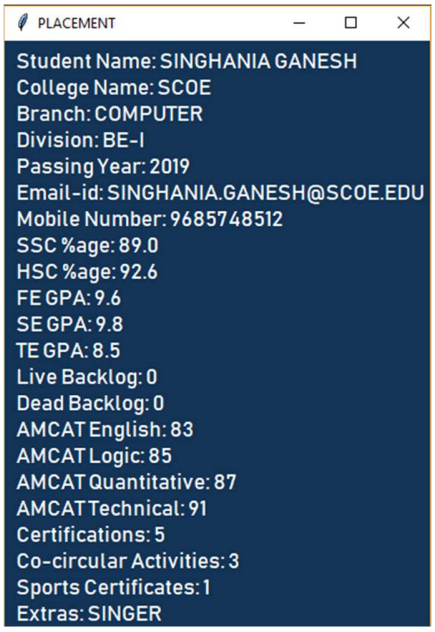

Fig 4.9 Student details being reviewed by company while placement process

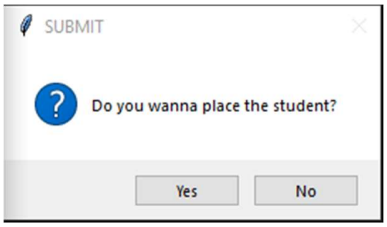

Fig 4.10 Placement decision pop-up

5. RESULTS & DISCUSSION

5.1 Visualization of Results

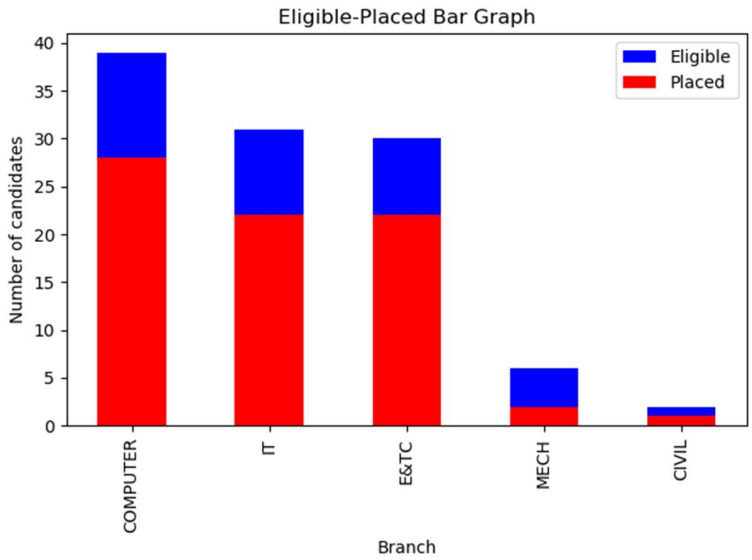

Fig 5.1 Branch-wise bar graph

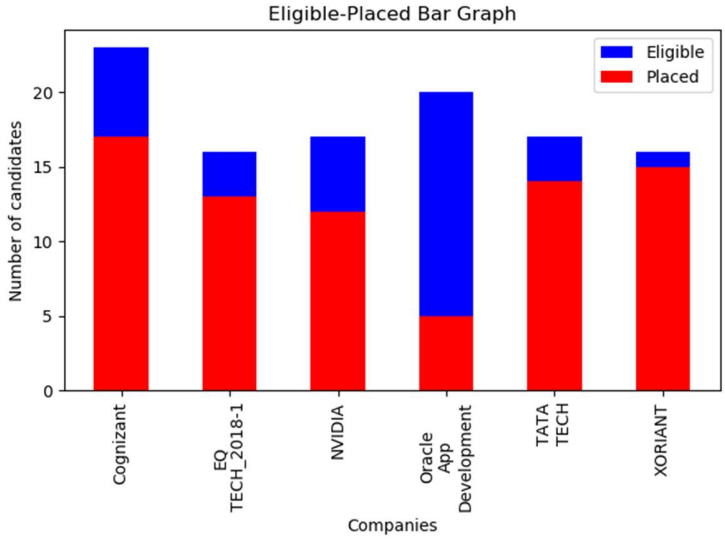

Fig 5.2 Company-wise bar graph

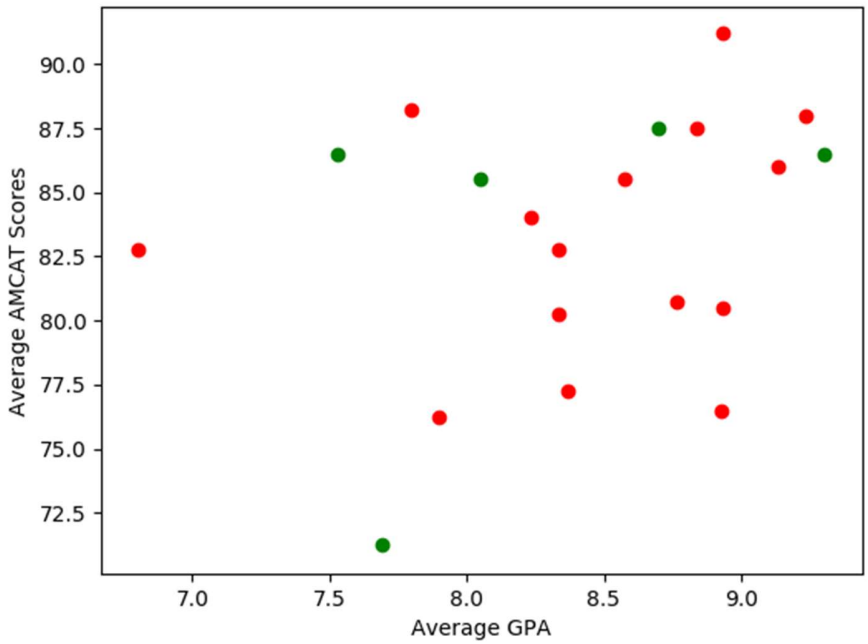

Fig 5.3 Scatter plot of placed & not-placed on basis of average GPA and AMCAT Scores

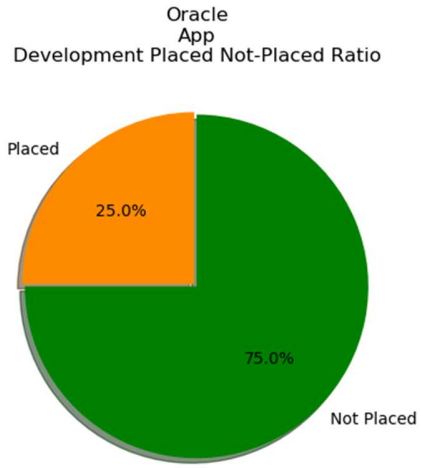

Fig 5.4 Pie Chart of Placed and not-placed student appeared for a company placement

6. CONCLUSION

The goal of the project was to reduce the communication gap between the various entities responsible for the placement process. There would be a drastic improvement if this system is implemented into the process. As notebooks, pen and paper are becoming redundant in the need of the global digitizing, this system indeed is an implementation of it. It will help in saving time for the various people participating in the process as well as the communicating with the students for the Placement Cell gets a lot easier to put in perspective. The various digital copies generated through out will definitely help in easier maneuvering of resources in hand as well as recreating them will not be a difficult task for the future.

The system also used machine learning to predict the chances of a student getting placed on the basis of academics and co-circular activities. Logistic regression trained on the data of student appeared for placement previously help a student becoming prepared mentally for outcome and can use it to improve his chances of getting a better placement.

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