

A PROJECT REPORT ON

CAMPUS PLACEMENT PREDICTION

SUBMITTED TO THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE
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(COMPUTER ENGINEERING)

SUBMITTED BY

VISHAL JADHAV

Exam No. : 71915981E

EKANSH KHANDEKAR

Exam No. : 71915936K

SANYAMI NAIK

Exam No. : 71916075J

SHUBHAM SOLANKI

Exam No. : 71916190J



DEPARTMENT OF COMPUTER ENGINEERING
ZEAL COLLEGE OF ENGINEERING & RESEARCH
NARHE, PUNE - 411041

SAVITRIBAI PHULE PUNE UNIVERSITY

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CERTIFICATE

This is to certify that the project report entitled

“CAMPUS PLACEMENT PREDICTION”

Submitted by:

VISHAL JADHAV	Exam No. : 71915981E
EKANSH KHANDEKAR	Exam No. : 71915936K
SANYAMI NAIK	Exam No. : 71916075J
SHUBHAM SOLAKI	Exam No. : 71916190J

are bonafide students of this institute, and the work has been carried out by them under the supervision of **Prof. AMOL BHOSALE**, and it is approved for the partial fulfillment of the requirement of Savitribai Phule Pune University for the award of the degree of **Bachelor of Engineering** (Computer Engineering).

(Prof. AMOL BHOSALE)

Project Guide

Department of Computer Engineering

(Prof. A. V. Mote)

Head of

Department of Computer Engineering

(Prof. _____)

External Examiner

SPPU

(Dr. A. M. Kate)

Principal,

Zeal College of Engineering &

Research, Pune-41

Place: Pune

Date:

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VISHAL JADHAV

EKANSH KHANDEKAR

SANYAMI NAIK

SHUBHAM SOLAKI

ABSTRACT

Predicting the performance of a student is a nice concern to the upper education institutions. The purpose of placement management system is to modify the present manual system by the assistance of computerized software system fulfilling their needs, so their valuable data/information is stored for a longer time with simple accessing and manipulation of data. Student's academic achievements and their placement in campus selection is a difficult issue in current manual system. Monitoring the student's progress for his or her campus placement helps in monitoring the student's progression within the academic surroundings. The aim of organizations is to supply superior opportunities to their students. This proposed student prediction system is most important approach which can be used to differentiate the student data/information on the basis of the student performance. Managing placement and coaching records in any larger organization is quite tough because of the large number of students. This system can classify the student knowledge with ease and can be useful to several educational organizations. There are several classification algorithms and mathematics-based techniques which can be taken nearly as good assets for classifying the students' information set in the education field. In Our system, BrainJS algorithm is applied to predict student performance which can facilitate to identify performance of students and also provides suggestion to improve performance for students such as we are going to classify the student's knowledge set for placement and nonplacement classes based on that result, education organizations can give superior training to their students. Based on data received by system, student's performance is analyzed in numerous views to check the achievements of the students through their activities and suggests improvement for better placement.

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LIST OF ABBREVIATIONS

ABBREVIATION	ILLUSTRATION
AI & ML	Artificial Intelligence and Machine Learning

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

Placement of students is one of the extremely important activities in educational organizations. Every student dreams to be successful in life. But every student cannot be placed in their dream company, hence this project plans to anticipate the placement opportunity of the students who have a better chance of placement in certain companies and thus find the best fit for the applicant, it will not only preserve time but will also assist in increasing the trust of the students.

We usually utilise LinkedIn or Naukri.com to look for jobs and apply for them, however these platforms provide us with a lot of possibilities. It's We've noticed that we get a lot of them. Choices that are unreasonably priced, or we are ineligible. To address this issue, we are planning to establish a technique for predicting the likelihood of being chosen for save time and allow a person to concentrate more on the task at hand His first preference. This will assist the learner in achieving his or her goals. The firm with the best fit, as well as the recruiters or Human Resources finds the finest applicant for the job. The task As a consequence, which will lead to satisfaction for both.

In Placement Prediction system predicts the probability of a undergrad students getting placed in a company by applying classification algorithms such as Decision tree and Random forest. The main objective of this model is to predict whether the student he/she gets placed or not in campus recruitment. For this the data consider is the academic history of student like overall percentage, backlogs, credits. The algorithms are applied on the previous years data of the students.

1.2 MOTIVATION

According to statistics 1.5 million engineers are graduating each year in India. The demand and need for qualified graduates in field of IT industry is rising day by day. But most of the students are unaware about the needs of the IT industry. The number of the student graduates who satisfies the requirements and quality of a company is very low. Placements are one of the biggest challenge faced by a student in the lifetime. It is the responsibility of the institutions to provide maximum placement chance to its students. Also the placement cell and teachers of an institute should take proper steps in order to produce a set of students suitable for each company's requirements.

All companies in the IT sector spends a large amount of its total capital in recruiting the students to its company. Thus it is necessary to find an alternative process of filtering to reduce the capital cost that is used for this process. Effective filtering of students could be performed by applying various data mining and machine learning tools on the student details.

Placement Predictor system helps in predicting whether a student will get placement or not. This system can also be helpful for identifying the areas where student needs to work on for placement.

Placements are the biggest opportunities in the life of a student and they need to be fully prepared while attempting it.

1.3 PROBLEM DEFINITION

Pandemic caused a drop in the number of students getting placed. Apply and attend Interviews to get jobs or internships. Companies can post Job/Internship details.

1.4 OBJECTIVE

- Explanatory Data analysis.
- Prediction of whether the student gets placed or not
- Determining characteristics affecting placements
- Prediction of salary secured by the student Determining characteristics affecting salary

This system aims to enhance the awareness of security personnel and decision-making automatically by collecting real-time information. The framework raises an alert at whatever point unsuitable movements are recognized. Subsequently, the framework can recognize portable items in the scene and classify their movements as permitted or denied. The calculation is carried out in a real world environment for usefulness confirmation. The similarities between the two pictures are compared based on the Euclidean distance.

1.5 PROJECT SCOPE AND LIMITATIONS

Campus placement of students plays very important role in colleges. Campus placement is the process where meet colleges and identify students which are talented and qualified, before they complete their graduation., this system makes the work of prediction of placement of student easy. We are developing a system in which the students will register/Login into the system and enter their biodata and skillsets, according to students' academic details the system will identify whether the student is eligible for the placement and recommend the courses to the students. Admin creates the courses and registers students to the respective courses. Admin can view the courses and students along with their attributes. Student can predict placement status of their own. If the student is eligible for placement then he/she can apply for

the different job posted by the recruiters. If the student is not eligible then he/she will follow the suggestions and try to fit into eligibility. Recruiter will be given by login and password by the admin and based on that they can post the job with their specific requirements. After posting each student will get notification and thus can apply for the job if interested. Simultaneously, the applications will be reflected along with customized resume. The recruiters will then short list the student for the next rounds and interview process. The shortlisted student will get notification of selection after this. The project also has the guest section module.

- Collected data is sent through third party applications.
- Bugs and user experiences issues.
- Sort and filter applications manually.
- Security issues

1.6 BRAIN JS

1. Simple To Use:

Brain.js is super simple to use. You do not need to know Neural Networks in details to work with this.

2. Fast:

Brain.js performs computations using GPU and gracefully fallback to pure JavaScript when GPU is not available.

3. Useful:

Brain.js provides multiple neural network implementations as different neural nets can be trained to do different things well.

4. Easy To Integrate:

Easily export and import trained models using JSON format or as a function. Host pre-trained models on your website easily.

CHAPTER 2

LITERATURE SURVEY

Artificial Neural Network and Linear Regression were implemented. ANN gave better accuracy than Linear regression. The dataset used was of 391 matriculation students from three batches, which are from intakes in July 2005 -07 and the Diploma students totaled up to 505 from 3 intakes in July 2006 - 08.

Authors reviewed several algorithms such as KMeans, Decision Tree, Naive Bayes. Dataset consists of columns such as Name, Age, Category, Sector, Rank, Address, Ph No., Gender, Specialization.

Self-made Algorithm was used. Dataset consists of columns such as Year, Reg-No., Branch, Percent. Skills, Effective Score, Placed.

The Various essential parameters required for students' job placement were discussed. Dataset used consisted of 318 students from different pass-out year batches such as 2014, 2015, and 2016.

Logistic Regression, Fuzzy Approach, Decision Tree Algorithm, Random Forest Algorithm and classification, and clustering techniques, Sum of Difference method, and Job Competency Modelling were reviewed by the authors. The dataset comprises academic details of students including their grade points and performance details and placement details are a potential source for predicting future placement chances.

Authors used Simple binomial logistic regression with an additional R-square test for higher accuracy. In- house student's database of Atharva College of Engineering was used.

Multinomial logistic regression with decision tree classifier of the scikit-learn module (Python) was implemented which achieved an accuracy of 71.66% in the validation dataset. Placement cell database of Amrita School of Engineering, Coimbatore. 2205,289 and 60 samples of training, testing, and validation data were used.

Expert system where the data of all the students are stored in CSV format. The system checks whether the students satisfy the criteria or not and then decides whether the student will get placed or not. The data was from a well-known engineering college situated in Pune. The dataset contains 2330 tuples and 81 attributes holding multiple streamwise data of the students.

The classification algorithms Decision Tree and the Random forest algorithm were discussed. The accuracy obtained after analysis for the Decision tree is 84% and the Random Forest is 86%. The dataset collected consists of over 1000 instances of students.

Logistic Regression was implemented, the training and testing accuracy of the algorithm was 98.93% and 83.333% respectively. The data used in the model is only in-house placement data from the 2009 to 2013 batch Information Technology (IT) branch of GNDEC.

CHAPTER 3

REQUIREMENT SPECIFICATIONS

INTRODUCTION

This project requires training and testing data-set along with Notepad++, VS Code and Windows 7/8/10. The Campus Placement Prediction requires a specific operating system, amounts of memory, CPU cores, and disk space.

3.1 Assumptions and Dependencies

Formulating an approach to Campus Placement Prediction requires the application of definitions and assumptions about when a student will get placed and not. Definition and assumptions made vary with the Student's score and achievements made along with the customized resume. The definition and assumptions, in turn, affect the methods subsequently applied to perform the prediction.

There are two standard outcome in the project and they are as follows :

- 1)A student getting placed with some other better suggestions
- 2)A student not getting placed with other better suggestions and efforts that would help him/her to get placed

3. 2 Functional Requirements

3. 2. 1 System Feature

A potential practical necessity for prediction could be a set of all the academic previous records and the projects along with history of one's academic background, the different certificates, result pdf that one wants to take into consideration.

A potential practical necessity for admin will be a own machine to track things on and a separate secured login and password to check the updates and also modify the necessary things time to time.

The key is that the functional requirements should be created at the undertaking level, which will surely impact the organization's way of life, students, recruiters, guest visitors, admin, and Training and Placement Officer.

3. 3 System Requirements

The inconsistency discovery programming requires a particular working framework, measures of memory, CPU centers, and plate space. You should stick to specific necessities to execute the irregularity identification framework effectively.

a. Operating System :-

- 1) A PC running an authorized form of Windows 8/9/10.
- 2) An authorized form guarantees that the conditions expected for the establishment are settled naturally by the working framework.
- 3) Notepad++, Vs Code.

b. Memory and CPU :-

- 1) Processor: An Intel Core i5 or more
- 2) RAM: 8 GB or 12 GB

c. Available disk space :-

The server requires minimum 30 GB of free disk space.

d. Permissions :-

Pseudo permissions are required to install the software required to implement an Campus Placement Prediction.

3. 4 Database Requirements

A data set of students is required to train and test the model, which will detect whether he/she get placed or not.

Data-sets Name:- *Campus Placement Prediction data-set.*

The Campus Placement Prediction data-set was downloaded and also made manually.

The dataset includes a number of records with different attributes that are considered for training and testing which are as follows

- Placed
- Engineering
- SSC Score
- HSC Score
- Undergraduate Score
- Postgraduation Score
- Project
- Internship
- Extras
- Arrears

3. 5 External Interface Requirements (If Any)**3. 5. 1 User Interfaces**

1	Student, Recruiter, Admin should be able to login to the system
2	Student should be able to view their profile
3	Student should be able to insert their details
4	Admin should be able to manage student and recruiter details
5	Student and recruiter should be able to change their password
6	Admin should be able to manage Student placement details
7	Coordinator should be able to help student and upload the training resources.
8	Student, recruiter and Admin should be able to update and edit the data
9	Admin should be able to delete Student data
10	Student should be able to change Username
11	Recruiter should be able to post the job
12	Recruiter should be able to schedule interview
13	Admin should be able to add course
14	Admin should be able to add company
15	Admin should be able to add department
16	Admin should be able to generate the dataset for ML
17	Admin should be able to retrain the ML model
18	Admin should be able to Dump the recruiter data
19	Admin should be able to Dump student data

20	Admin should be able to Dump the particular documents
21	Admin should be able to select the coordinator
22	Admin should be able to upload the picture or documents in gallery
23	Student should be able to check whether he/she getting place or not
24	Student should be able to apply jobs
25	Student should be able to use training resources effectively
26	Admin, Student, Recruiter, should be able to see statistics of pervious year data

3. 6 Analysis Models: SDLC Model to be applied

The SDLC life cycle chosen for the project “Campus Placement Prediction” is Waterfallmodel. The Waterfall Model was the first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, eachphase must be completed before the next phase can begin and there is no overlapping in the phases. The Waterfall model is chosen for the project because all the requirements of the project is under consideration at the requirement phase and no any additional function is to be added at the middle of the project. The waterfall model was closely matching our project details and implementation.

The water model consists of six phases mainly:

1.Communication

In the communication phase we have discussed about the requirements of the project. Thought of the final output expected after the completion of project. Which tools and technologiesare required to complete the project? The basic requirements to

complete the project i.e., dataset is taken from the good website from internet and build the dataset manually. The algorithms to be implemented and to design front end and authenticate the user with some extra features is also been discussed.

2.Planning

In the Planning Phase, we have scheduled the estimated time to complete the project and divided the project in different modules. We all decided according to our capabilities and skills divided the work amongst ourselves. We decided to keep a track on the project how much part of the project is completed and how much part is left to complete. Divided the part of projects and how we can increase the accuracy of project.

3.Implementation

In the implementation phase, the actual project is started to code. The phase starts with training and testing of dataset . The next parts come of applying algorithms on the trained dataset. After applying all two algorithms on trained dataset the best algorithm is chosen from it which has high accuracy and less error percentage. After the data is imported to website through which it can be used by users by giving inputs to the website and the predicted whether student get place or not will be seen.

4.Testing

In the testing Phase, all the units developed in the implementation phase will be checked on different inputs. The entire system is tested for any faults and failures. If the fault or failure occurs in the system, we will try to overcome it.

5.Deployment

In the deployment Phase, the project will be deployed on the web with a good User interface so the user interaction is good and user-friendly. For the deployment on the web, we will be using a free web hosting tool.

6.Maintanenece

In the maintenance phase, the better version of the project willbe deployed with extra added features. If any faults occur after deployment, it will also be fixed.

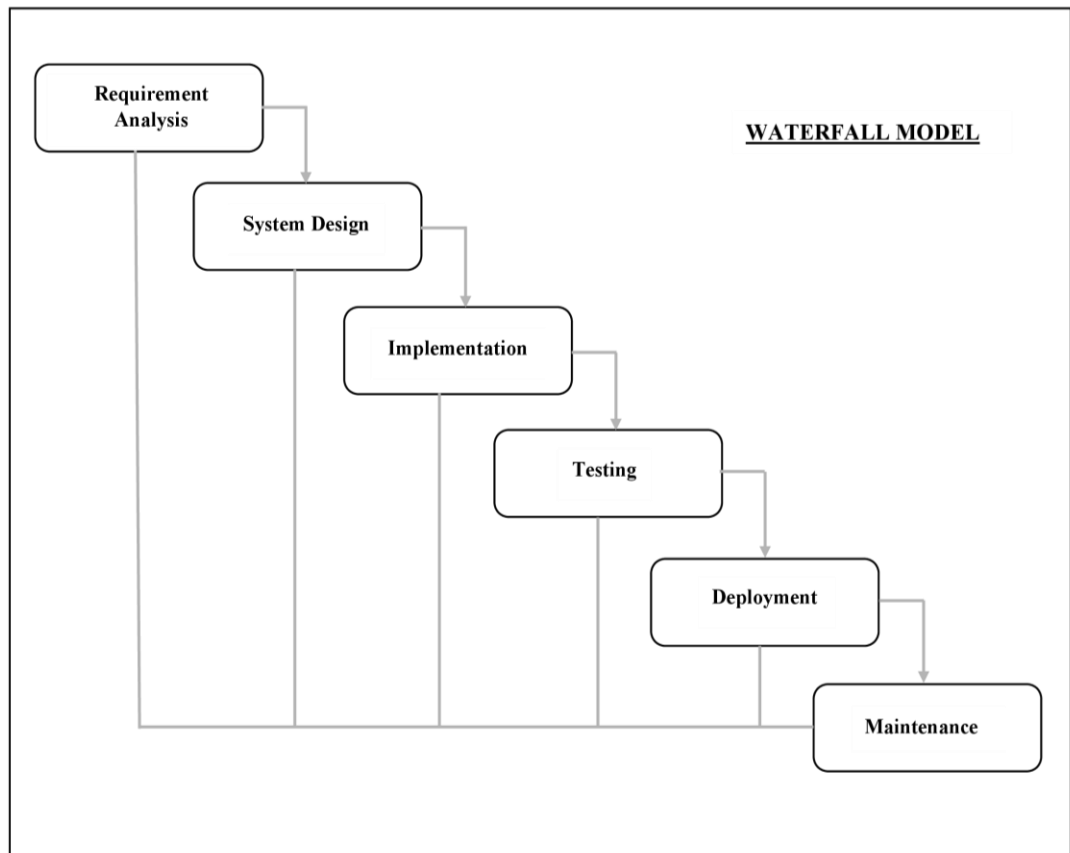


Fig 3.6: Waterfall Model

CHAPTER 4

SYSTEM DESIGN

4.1 System Architecture:

System architecture comprises of three main parts which are as follows:

- Frontend
- Connectivity
- Backend

1. Frontend:

This is also called as the Client Tier. It basically comprises of three more subparts and the work in synch for effective outcome. The client tier sends the HTTP request to connectivity. The subparts are given below,

- HTML/CSS/JAVASCRIPT
- CHROME BROWSER
- DESKTOP

2. Connectivity:

As shown in the figure and the name its self suggest that it connect the frontend and backend. The connectivity is kind of mediator the client tier and database tier. It sends the HTML page to frontend and RequestData to backend as shown in the figure. The subparts are given below,

- NODEJS
- EXPRESSJS
- APPLICATION SERVER

3. Backend Tier :

The last part of the system architecture is database tier also called the backend. It comprises the all the user data and receives request data from the business logic tier and send the mongoDB data back. The sub part of this are as follows,

- MONGODB
- DATABASE SERVER

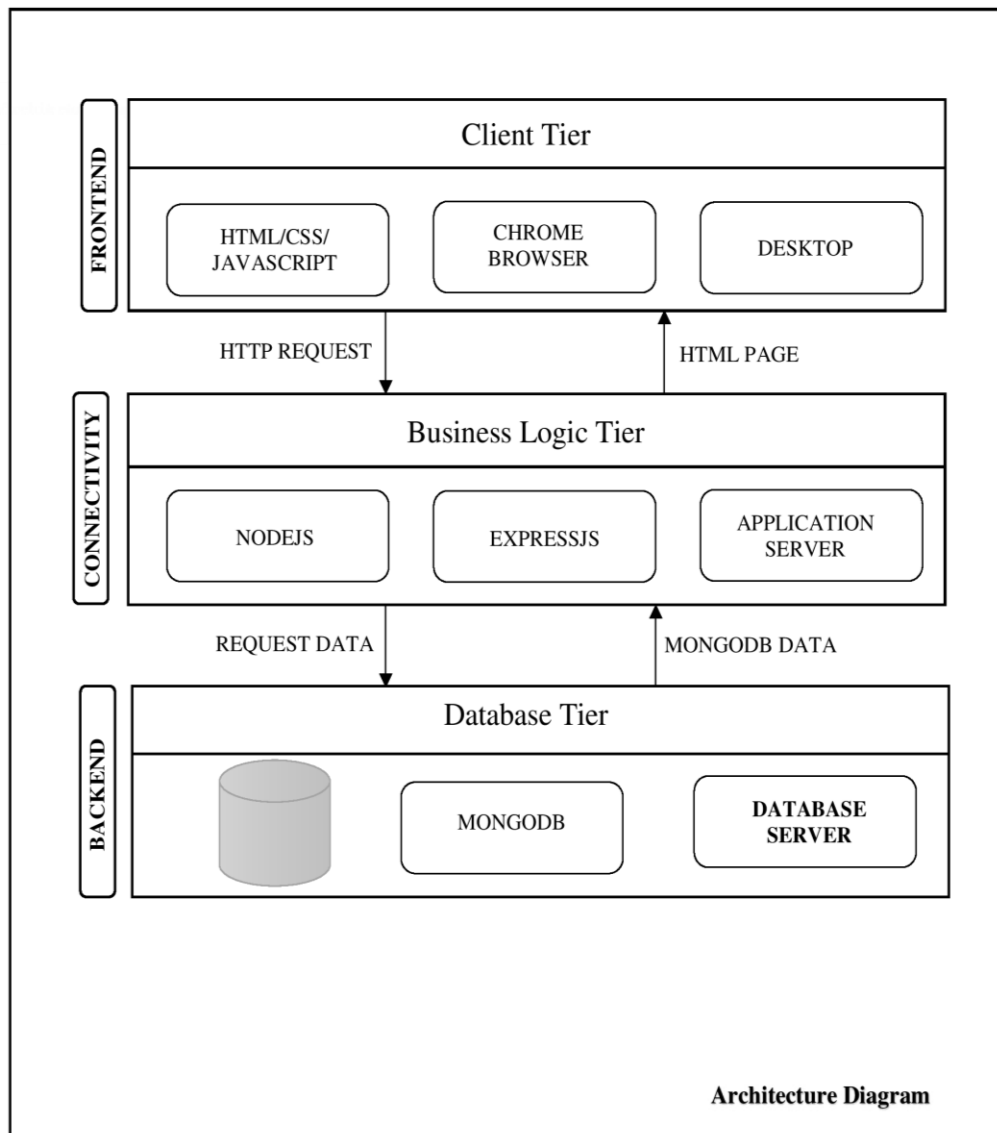


Fig 4.1: System Architecture

4. 2 Data Flow Diagram:

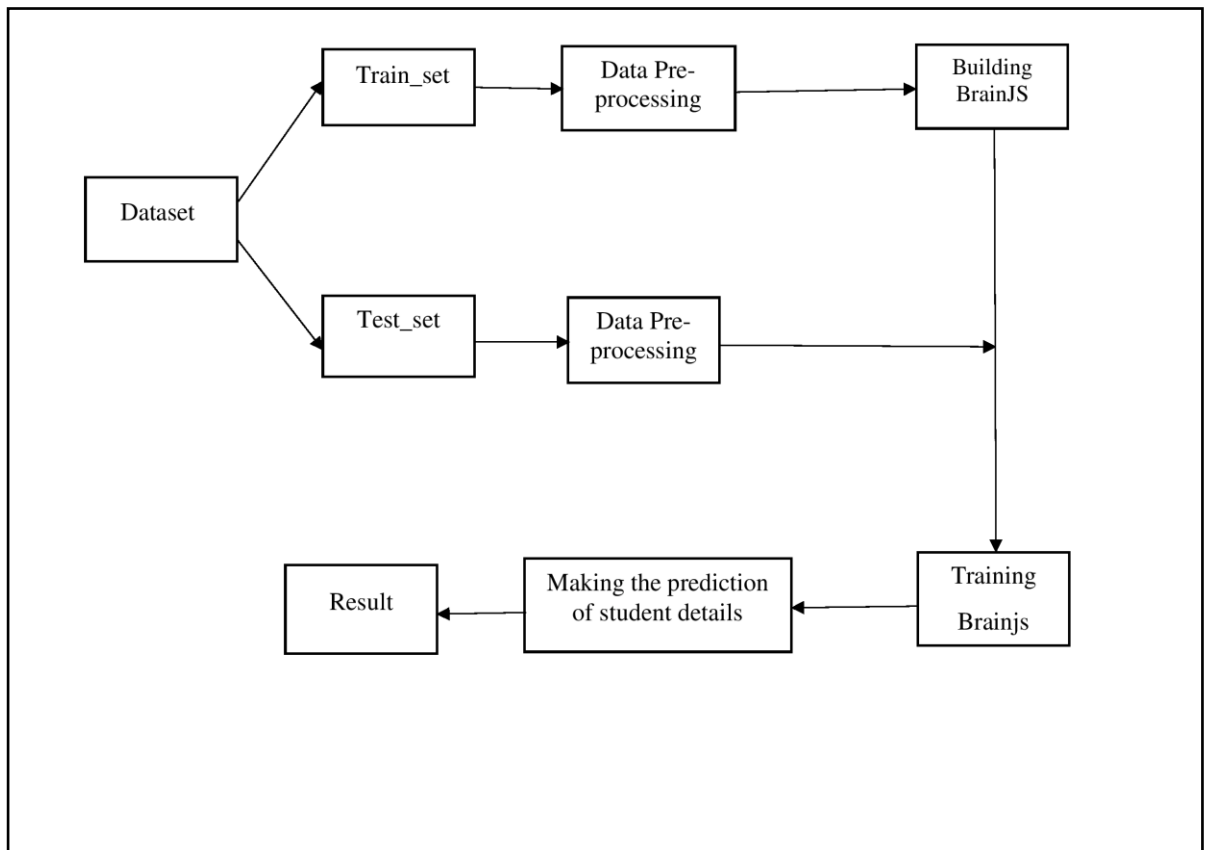


Fig 4.2: Data Flow Diagram

4.3 UML Diagram

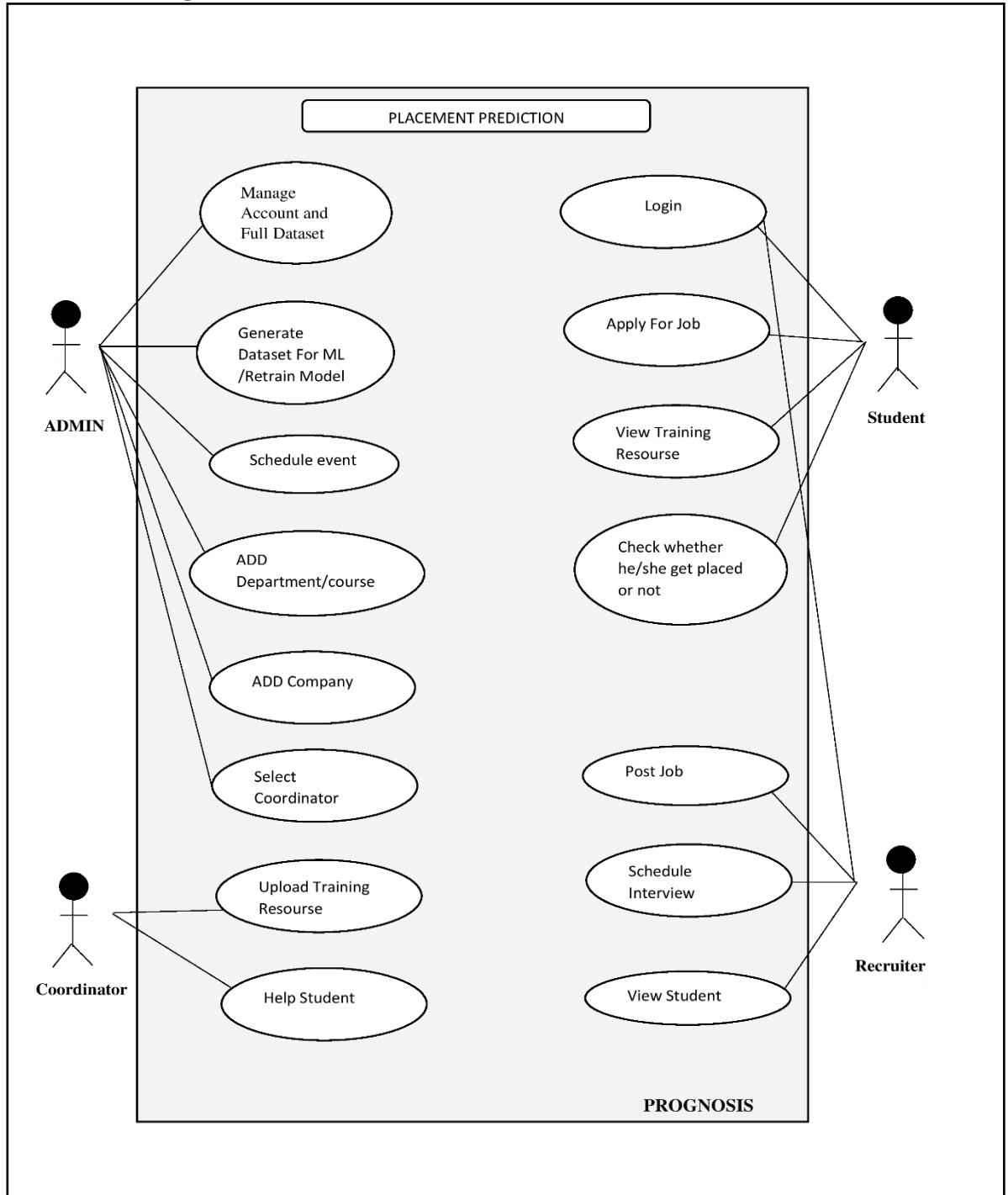


Fig 4.3: UML Diagram

4. 4 E-R Diagram

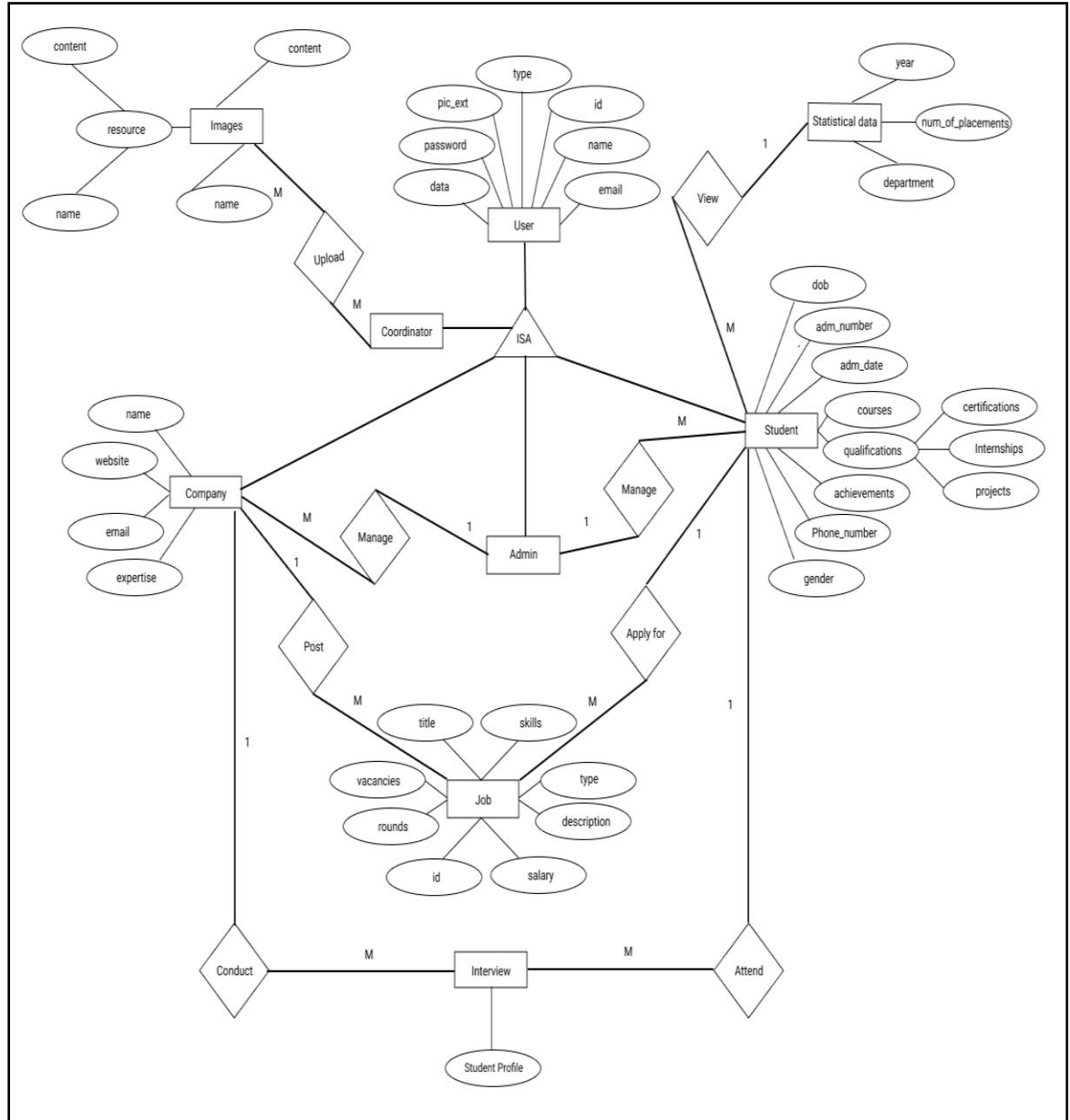


Fig 4.4: ER Diagram

4.5 LEVELS

LEVEL 0

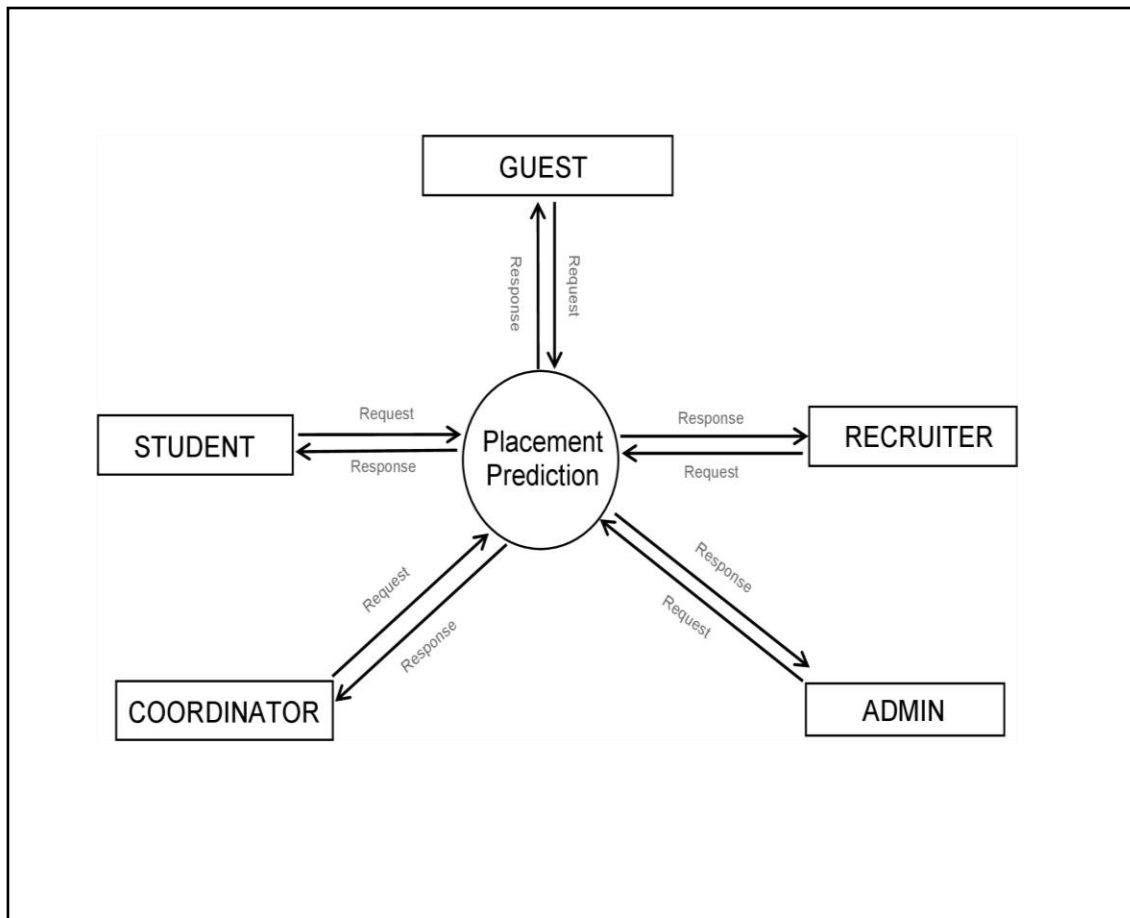


Fig 4.5 .1: Level 0 Diagram

LEVEL 1.0

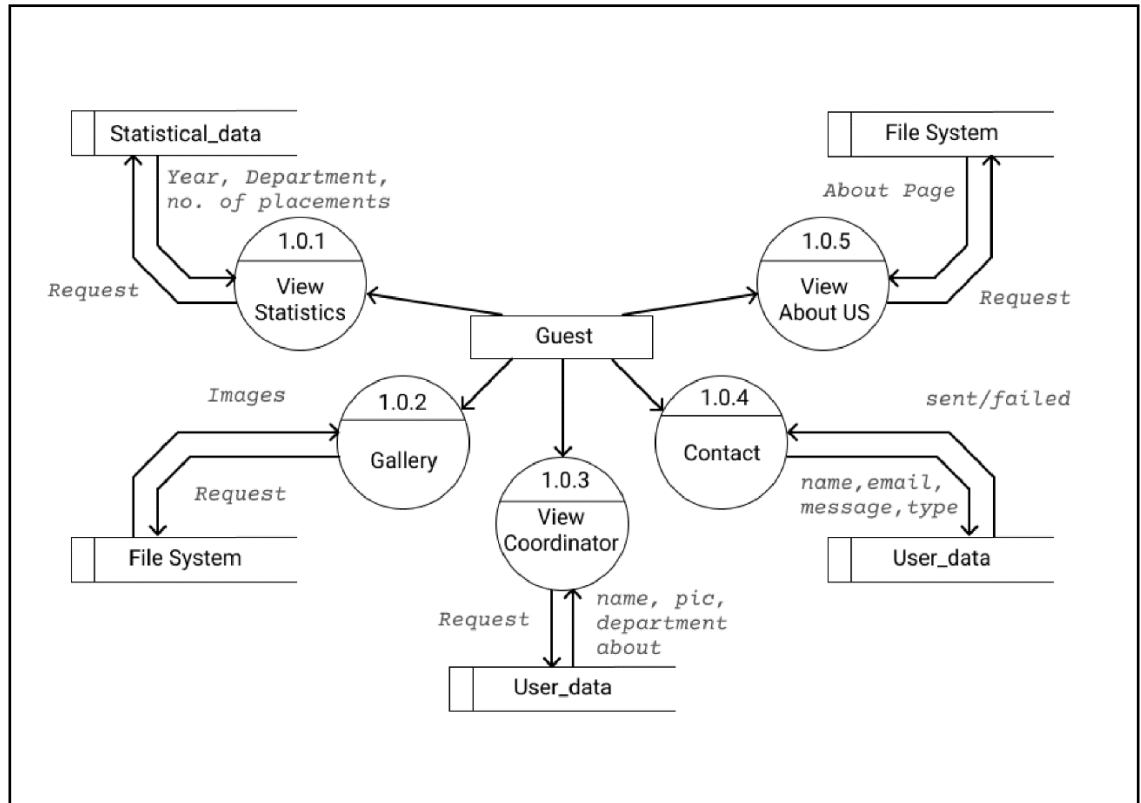


Fig 4. 5 .2: Level 1.0 Diagram

LEVEL 1.1

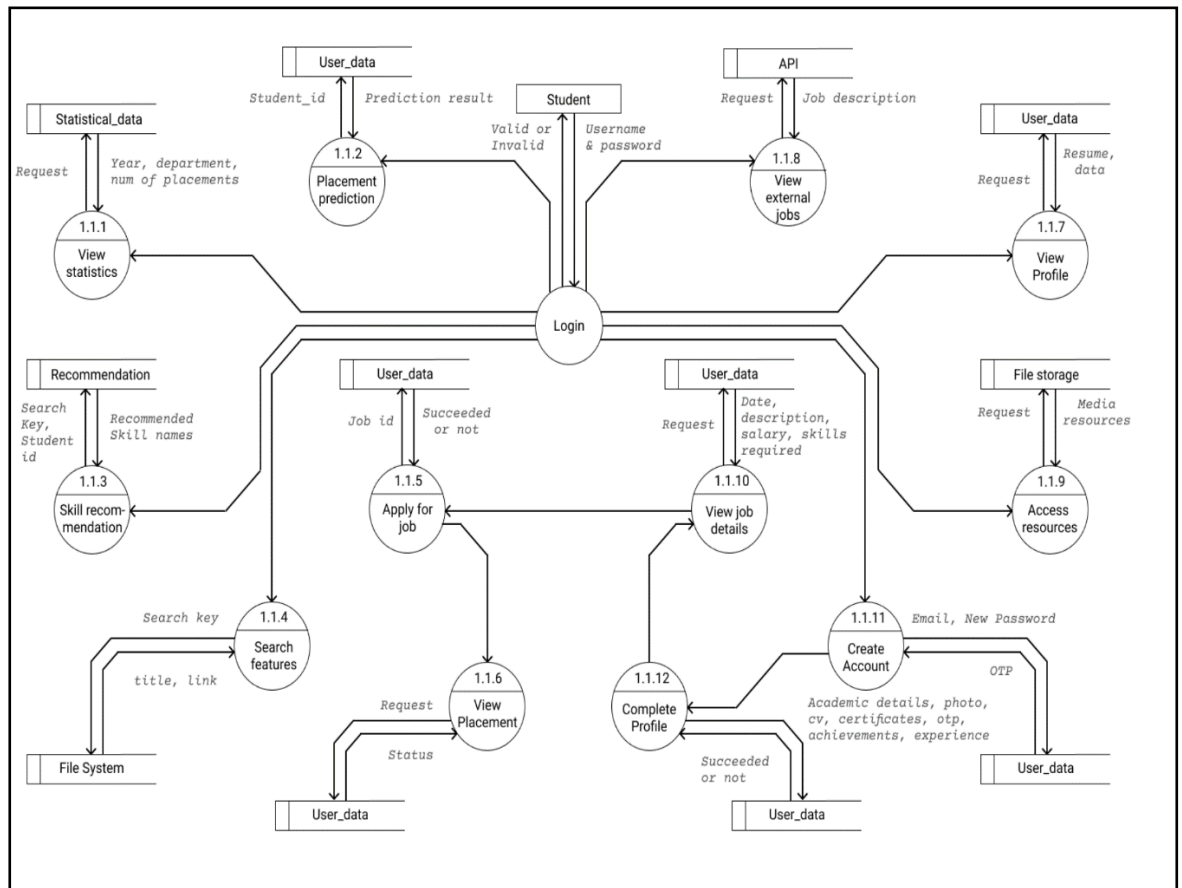


Fig 4. 5. 3: Level 1.1 Diagram

LEVEL 1.2

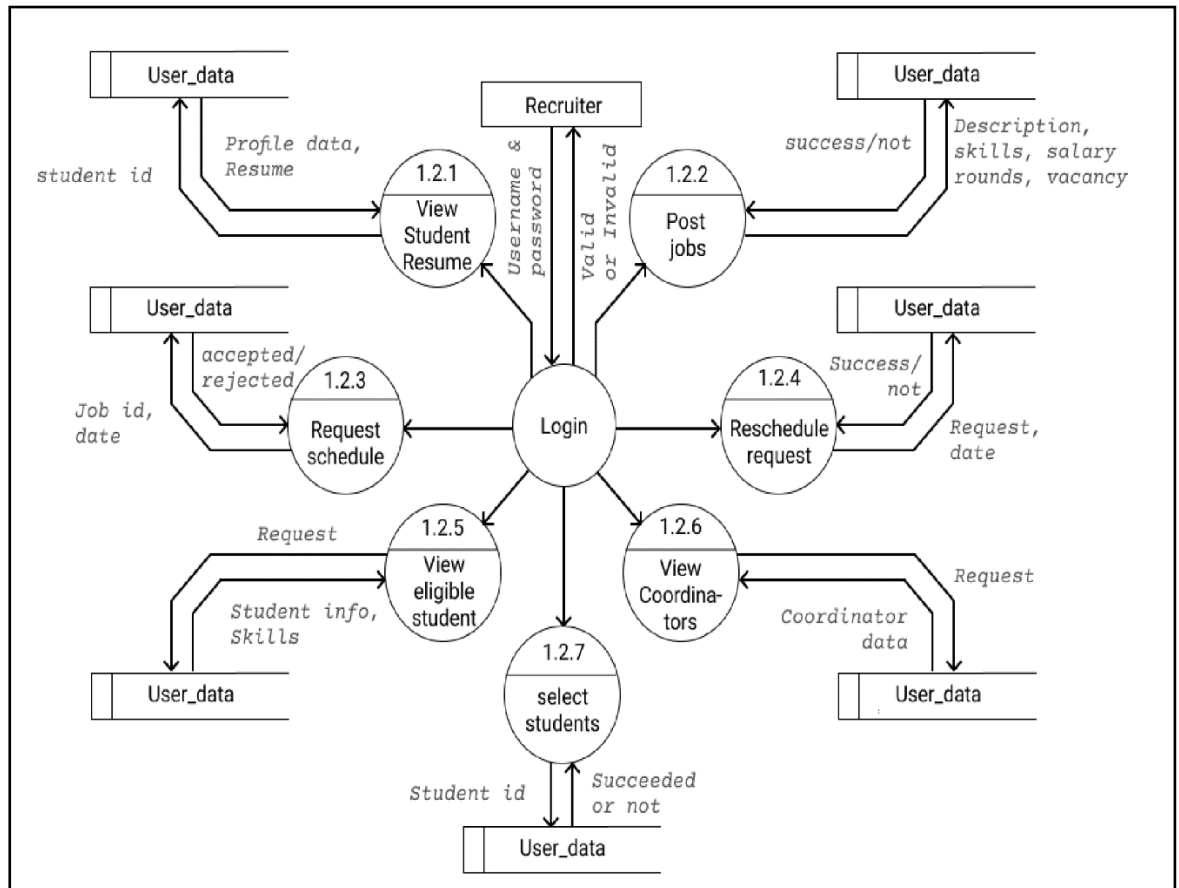


Fig 4.5.4: Level 1.2 Diagram

LEVEL 1.3

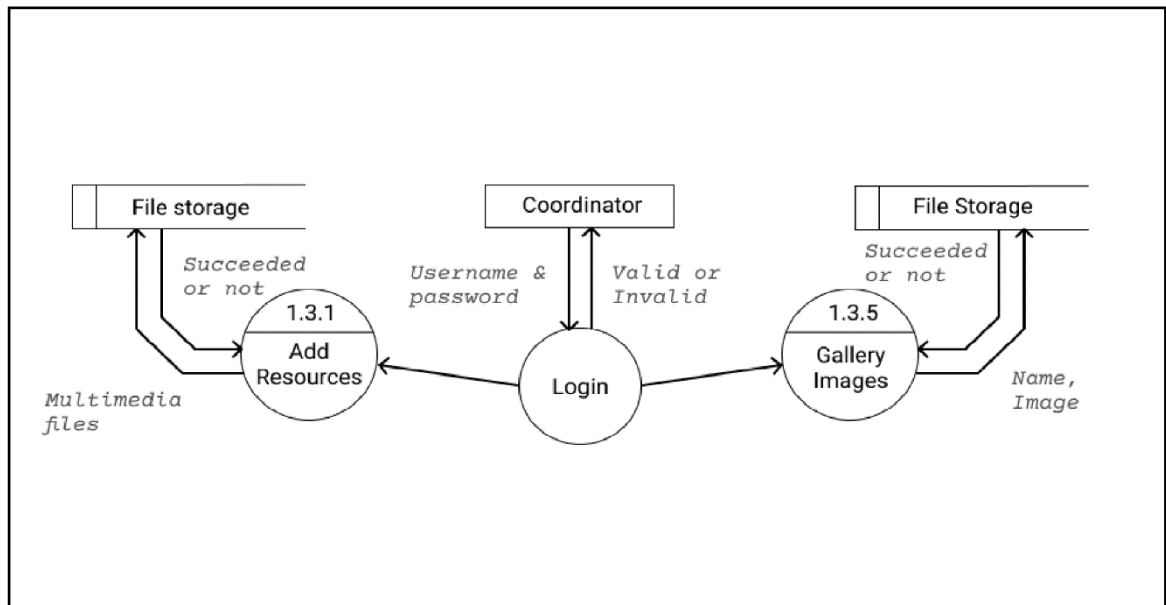


Fig 4 .5 .5: Level 1. 3 Diagram

LEVEL 1.4

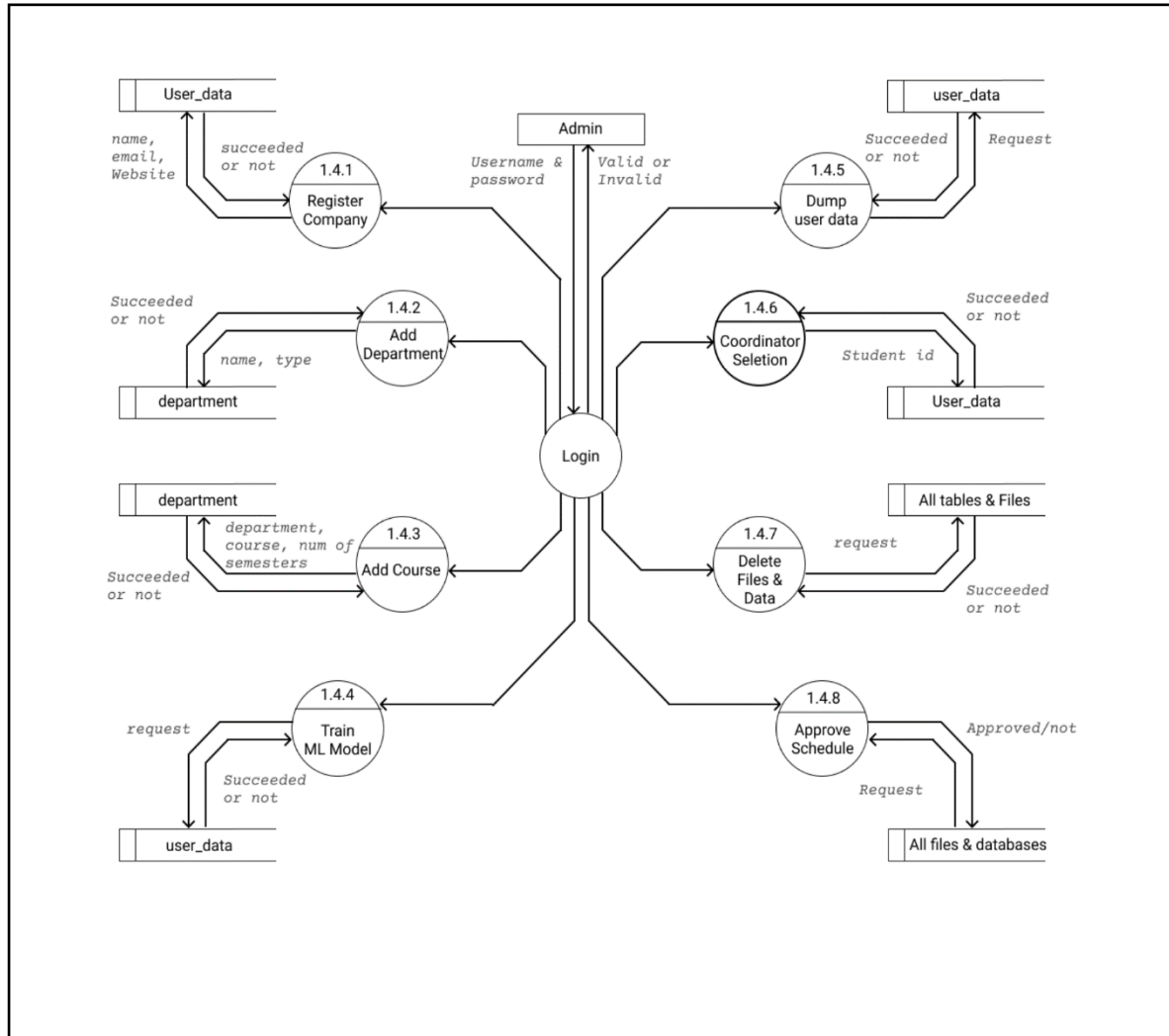


Fig 4 .5 .6: Level 1. 4 Diagram

CHAPTER 5

PROJECT PLAN

Sr. no.	Expected Target to be Achieved	First Semester			Second Semester		
		1 months	1 months	2 months	2 months	1 months	1 months
1	Literature Survey						
2	Prepare Detail Specification						
3	Procurement of equipment and other related material						
4	Project Report - Stage 1						
5	Coding and Development						
6	Project Report - Stage 2 /Research Paper generation						
7	Consult Expert/Guide						

Table 5.1: Project Schedule

CHAPTER 6

CODE SNIPPETS

```
1  {
2      "name": Department Name,
3      "courses": [
4          {
5              "name": Course Name,
6              "num_of_sem": number of semesters
7          }
8      ],
9      "engineering": engineering or not
10 }
```

Fig 6 .1: Department

```
1  {
2      "year": year,
3      "departments": {
4          "department name": number of placements
5      }
6  }
```

Fig 6 .2: Statistic

```
1  {
2    "email": email,
3    "password": password,
4    "type": "admin",
5    "messages": [
6      {
7        "from": from email,
8        "name": name,
9        "type": message type,
10       "message": message,
11       "date": timestamp
12     }
13   ]
14 }
```

Fig 6 .3: Admin

```

1  {
2    "email": email,
3    "data": {
4      "name": company name,
5      "website": website,
6      "job": {
7        "title": job title,
8        "type": type of job,
9        "date": timestamp,
10       "salary": salary,
11       "mhskills": [
12         compulsory skills
13       ],
14       "ghskills": [
15         good to have skills
16       ],
17       "description": description,
18       "vacancy": vacancy,
19       "rounds": rounds,
20       "applied": [
21         student id
22       ],
23       "selected": [
24         student id
25       ],
26       "schedule": {
27         "recruiteraccepted": true/false,
28         "adminaccepted": true/false,
29         "date": date
30       }
31     },
32     "type": "recruiter",
33     "password": password,
34     "messages": [{
35       "from": Sender Email,
36       "name": Sender name,
37       "message": message,
38       "type": type,
39       "date": timestamp
40     }]
41   }

```

Fig 6 .4: Recruiter

```

1 {
2   "email": email,
3   "password": password,
4   "type": "student",
5   "messages": [{
6     "title": title,
7     "message": messages
8   }],
9   "otp": verified/generated,
10  "data": {
11    "name": name,
12    "about": about,
13    "phone": phone,
14    "gender": gender,
15    "dob": dob,
16    "admission": {
17      "number": admission number,
18      "type": type,
19      "year": year,
20      "department": department id,
21      "course": course name,
22      "semester": current sem,
23      "arrear": active arrear,
24      "engineering": engineering or not,
25      "passdate": passout date,
26      "placed": placed or not
27    },
28    "education": {
29      "sslc": {
30        "board": board,
31        "school": school name,
32        "mark": mark,
33        "passdate": passout date
34      },
35      "plustwo": {
36        "board": board,
37        "school": school name,
38        "mark": mark,
39        "passdate": passout date
40      },
41      "course": [{
42        "type": type,
43        "name": name,
44        "college": college name,
45        "cgpa": mark,
46        "passdate": passout date
47      }],
48      "experience": [{
49        "type": type,
50        "title": title,
51        "description": description,
52        "from": start date,
53        "to": end date
54      }],
55      "achievement": [{
56        "type": type,
57        "title": title,
58        "description": description,
59        "from": start date,
60        "to": end date
61      }],
62      "skills": [ skills ]
63    },
64    "pic_ext": profile pic extension
65  },
66  "experience": [{
67    "type": type,
68    "title": title,
69    "description": description,
70    "from": start date,
71    "to": end date
72  }],
73  "achievement": [{
74    "type": type,
75    "title": title,
76    "description": description,
77    "from": start date,
78    "to": end date
79  }],
80  "skills": [ skills ]
81 }

```

Fig 6 .4: Student

CHAPTER 7

OTHER SPECIFICATIONS

7.1 Advantages

- Manual efforts are less.
- Accuracy is higher compared to other methods.
- Efficient and reliable.
- Students will get complete knowledge of the placement process.
- Students will get enough time for preparation.
- Everyone will be able to know their strength and weakness and in which area they need to work.
- Their route to reach their goals will be much easier as we will be helping them at every step.

7.2 Limitations

- Collected data is sent through third party applications.
- Bugs and user experiences issues.
- Sort and filter applications manually.
- Security issues

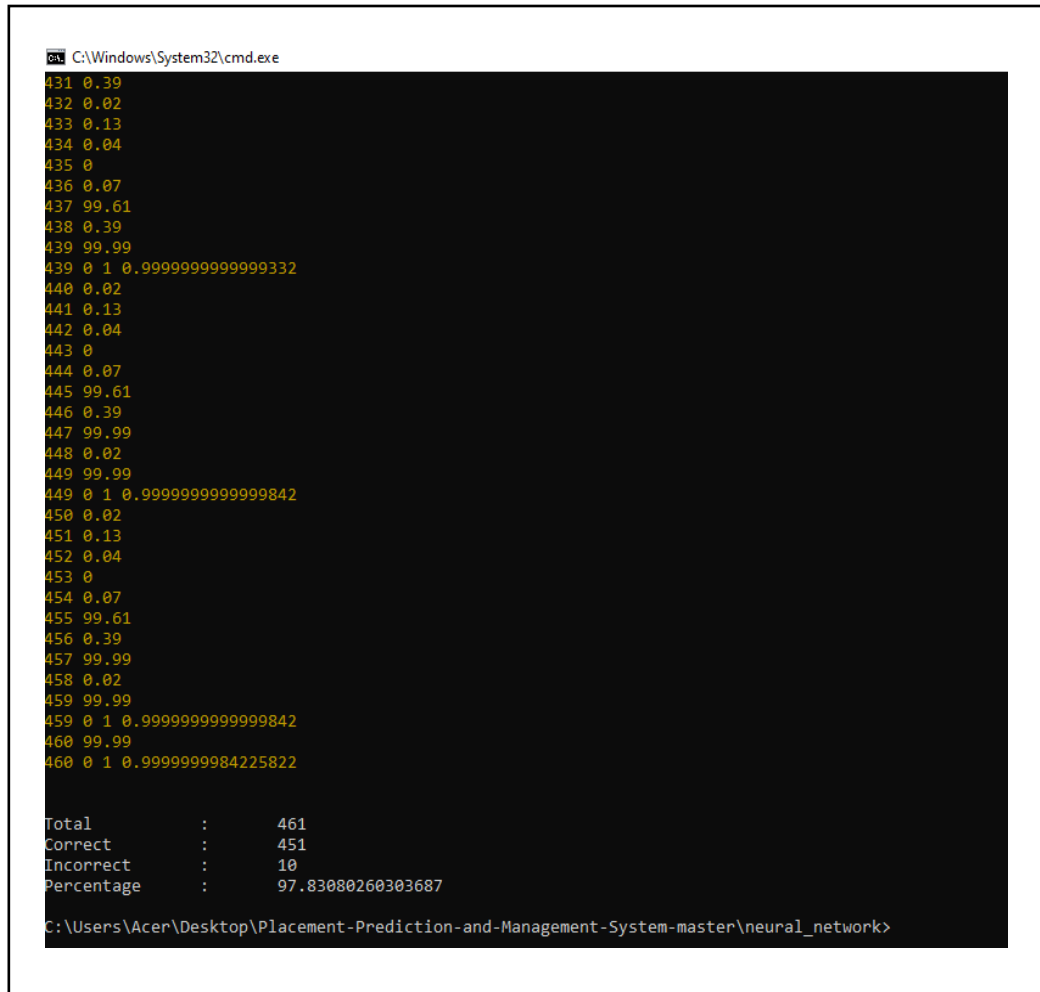
7.3 Applications

- The campus Placement Prediction System can be used by colleges for on-campus placements.
- The system can be used by companies to recruit students from the college
- The students can effectively use the system to get their dream jobs from the campus efficiently.

CHAPTER 8

RESULTS

Output Frames:



```
C:\Windows\System32\cmd.exe
431 0.39
432 0.02
433 0.13
434 0.04
435 0
436 0.07
437 99.61
438 0.39
439 99.99
439 0 1 0.99999999999999332
440 0.02
441 0.13
442 0.04
443 0
444 0.07
445 99.61
446 0.39
447 99.99
448 0.02
449 99.99
449 0 1 0.99999999999999842
450 0.02
451 0.13
452 0.04
453 0
454 0.07
455 99.61
456 0.39
457 99.99
458 0.02
459 99.99
459 0 1 0.99999999999999842
460 99.99
460 0 1 0.999999999984225822

Total      :      461
Correct    :      451
Incorrect   :       10
Percentage : 97.83080260303687

C:\Users\Acer\Desktop\Placement-Prediction-and-Management-System-master\neural_network>
```

Fig 8.1: Prediction Accuracy

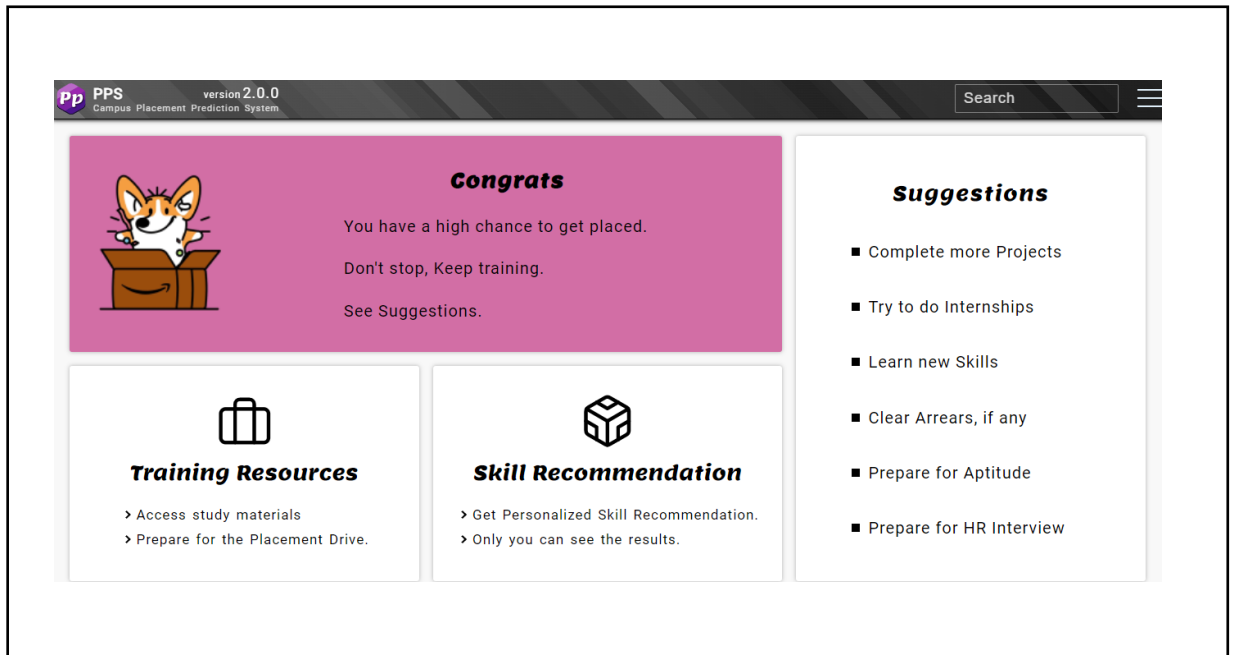


Fig 8 .2: Prediction(Placed)

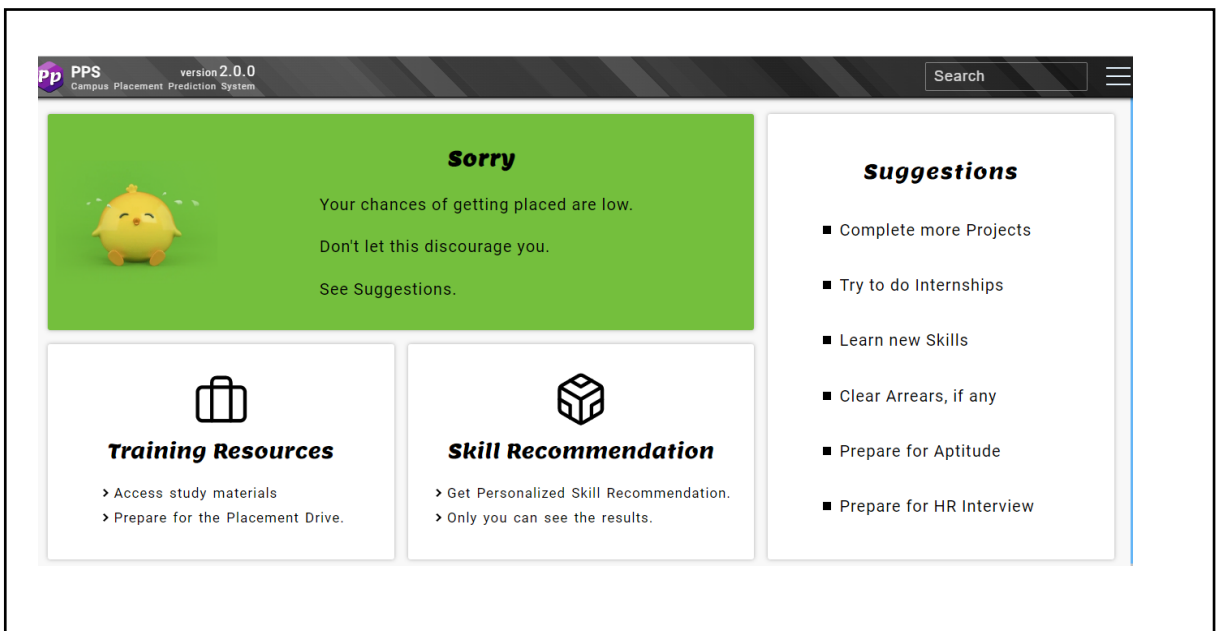


Fig 8 .3: Prediction(Unplaced)

CHAPTER 9

CONCLUSION AND FUTURE WORK

This system is helpful for institutions to predict student's campus placement. This system would help reduce tedious job of manual placement system. The placement officer can work on identifying the weaknesses of each students and can suggest improvements so that the students can overcome the weakness and perform to the best of their abilities. The future enhancements of the project is to focus on to add some more parameters to predict more efficient placement status. We can also enhance the project by predicting some solutions or suggestions for the output generated by system.

A detailed study was conducted based on different placement prediction models. From the study it is clear that the student dataset containing academic and placement details are a potential source for predicting the future placement chances. This prediction can enlighten students to identify their capabilities and improve accordingly. This system also helps in the academic planning of an institution to prepare proper strategies and improve the placement statistics for the future years.

FUTURE SCOPE

We can use more optimized algorithms for better predictions. We can also integrate online courses and services. The future enhancements of the project is to focus on to add some more parameters to predict more efficient placement status. We can also enhance the project by predicting some solutions or suggestions for the output generated by system. It would of great help if we revise and update our curriculum and other extra activities for each semester in accordance with the public, private and government sector requirement. We can also predict which company picks which category of students. Make a list of skill a particular company looking for, then on the basis of that we can train our student. These traits will make prediction process more accurate.

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