testbook

STUDY SMARTER NOT HARDER

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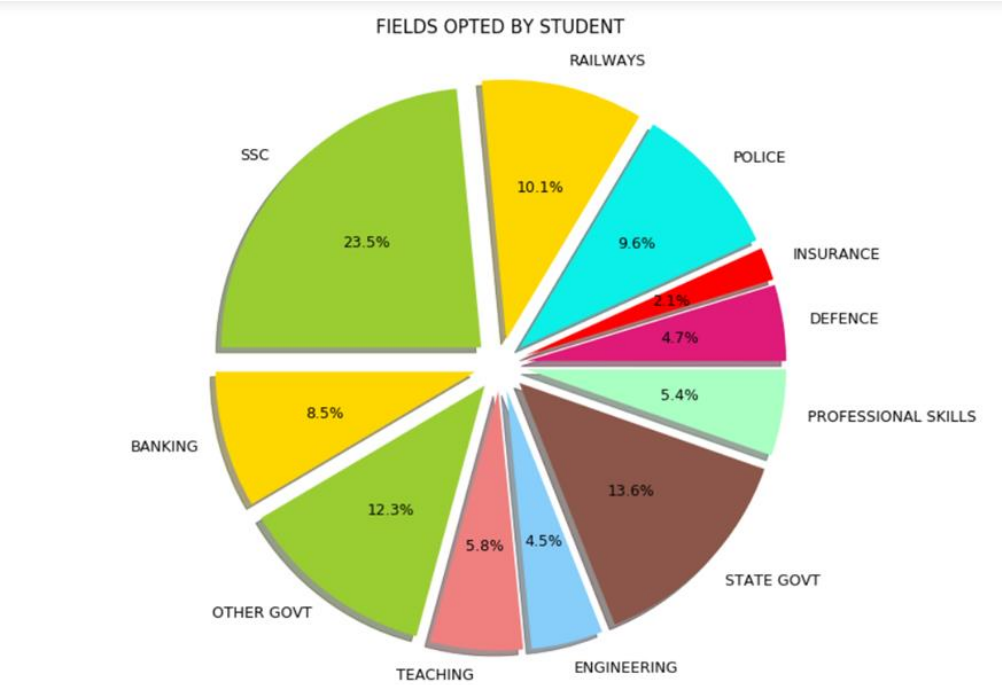
IDEA

Our primary Idea was to set the priorities of the courses and the tests on the basis of how many students have enrolled into them and then recommend the most frequent course/test of the Super target group in which the student is enrolled.

Solution Approach:

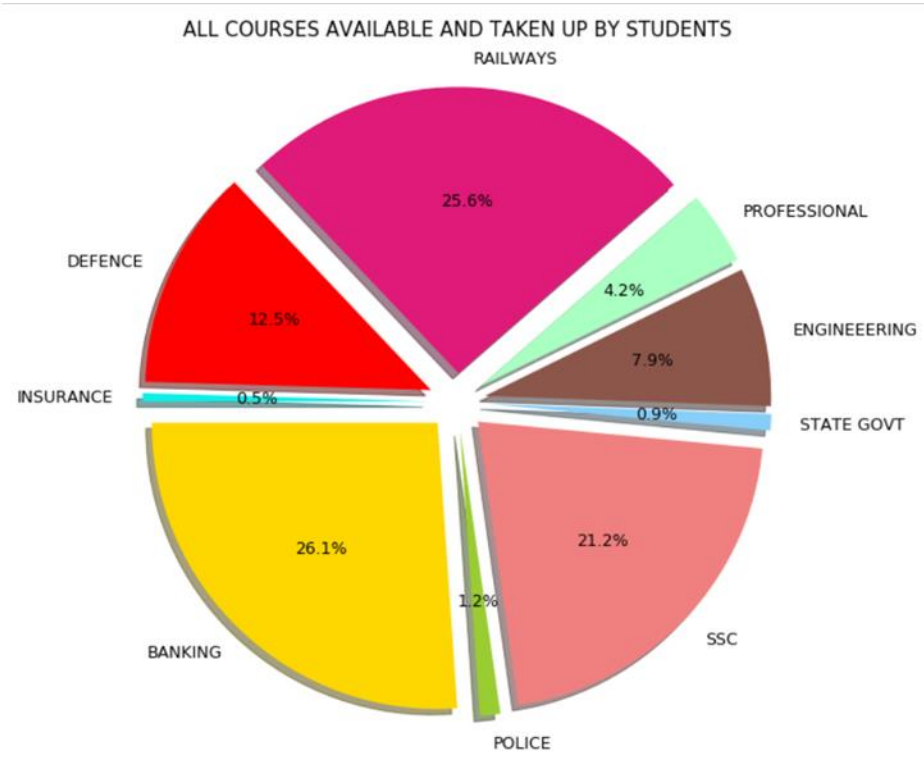
- First, we find out all the different super groups that existed in the dataset. Those were respectively " 'Banking Exams', 'Defense Exams' , 'Engineering Recruitment Exams', 'Insurance Exams', 'Other Govt. Exams', 'Police Exams', 'Professional Skills', 'Railways Exams', 'SSC Exams', 'State Govt Exams', 'Teaching Exams'.



- As evident from the above chart We first tried to get a fair idea about the super target group and number of students opting for them.

<u>For course Recommendation System:</u>

- We have found out all the super target groups for which we have courses, there are in total 80 courses and courses for all the super target groups are there except for teaching exams super group.



- We found the number of times each course has been enrolled previously by the students of each super target group and set the priority of each course on that basis.

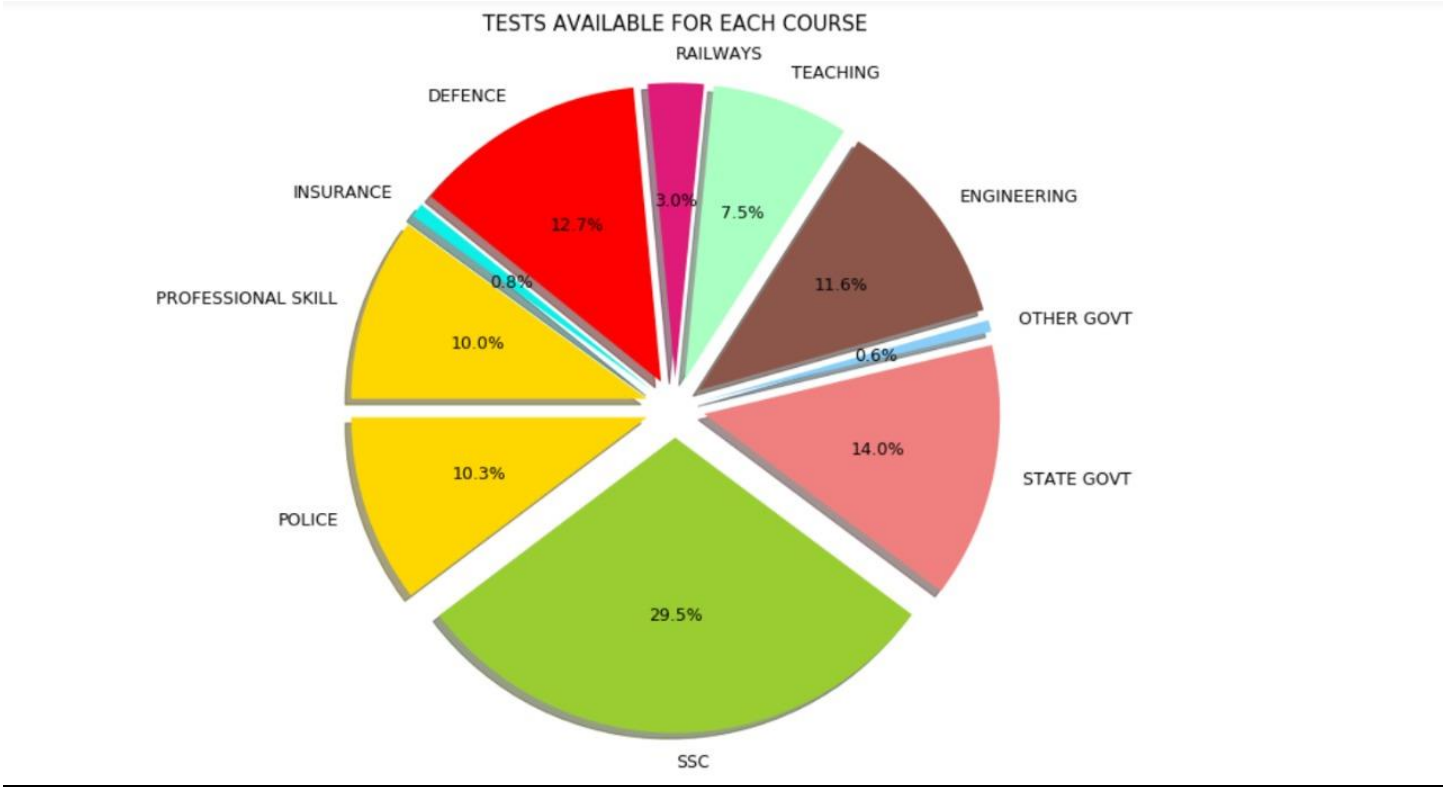
- Then we considered the student id as input and found out the super target group for which he is enrolled and recommended him the course such that the recommended course is the most frequent for that super target group and the student has not taken it before.

- If there is more than 1 super target group for the student then we have recommended him the most frequent course of each domain in which he is enrolled.

For Test Recommendation System:

- As super target group for most of the tests were missing we found the super target group for each test first (manually and with code).

- We found there is a test for each super target group.



- We found all the tests taken before by the students and in a similar fashion to what we did with the courses, set the priorities for the tests.

- Then we considered the student id as an input, and first checked if student has given any test before if student has corrected more than 1 and less than 25 questions then we recommend the that test again to the student because, there is a major chance of improvement if he appeared again along with that we recommended the most frequent tests for the super target group in which he was enrolled.

- We do not recommend the tests student has taken before and corrected less than 1 question because we think student is not ready for that test for now and can try for some other tests.

- We even do not recommend the tests that the student has previously appeared and scored more than 25 because now he can focus on some other tests of his super target group.

Why this Approach:

- We have taken this approach as this approach is pretty accurate and there is no chance of recommending the courses that is not relevant to the students, which will be evident from our result analysis.

- Why not Deep Learning/Machine Learning:
  We have tried different models like Autoencoders , boltzamann machine for this problem as we do not have much data, results were not that accurate so we thought of using this approach as it was more precise.

Code:

Following is the link for the code,

For course Recommendation System:

https://colab.research.google.com/drive/1kXKDtnzL3qMU7VDa_y2tuXg-1hFL4QQP?usp=sharing

For Test Recommendation System:

https://colab.research.google.com/drive/1p9q3CBiIu4XfePpwx9qUBEhPRsMlFTC3?usp=sharing

For Dataset Visualization:

https://colab.research.google.com/drive/1pewss-Q4rKPfLxKrq_41OrStQuok1O8w?usp=sharing

Tools/Framework:

- The whole code is written in Python Language.
- Our code implements Data Structures and some Algorithms very effectively.
- We have also used some libraries like Pandas, NumPy , JSON
- We are using Flask to create the User Interface.

Results Analysis:

- For one input given usually 3 output Courses and Exams are suggested based on its Super Target. These outputs are extremely coherent as we are considering the broader field of the students.

Test Recommendation Analysis:

```
15124e459c173f28a53b4863fdb8f6b3
The recommended Tests are

['82e37348498073236bf7fbd32191bf3e' 'a82e3ddc77d28b3ef773e1228dd13d12'
 'b4ca204631b17b6b486c361872fd2af2' 'dfb896ae1ed198daa72758980ddc4efe']
```

- For a Student with Sid-"**15124e459c173f28a53b4863fdb8f6b3**" is enrolled for preparation of Banking, Railways and SSC exams. So the test "**dfb896ae1ed198daa72758980ddc4efe**" is recommended on the basis that it is taken by maximum number of students i.e. 368 who are enrolled for Banking exams preparation. Similarly"**b4ca204631b17b6b486c361872fd2af2**"and"**82e37348498073236bf7fbd32191bf3e**" are recommended because he is enrolled for SSC and Railways Preparation and these tests were taken by 94 , 94 students respectively which is maximum and the test "**a82e3ddc77d28b3ef773e1228dd13d12**" is recommended because the student has previously enrolled for this test and got 2 marks in that and we think there is a chance of improvement if student appears again for the same test, But we have not recommended

him the other test in which he has appeared previously i.e. "**dcf403b70447d14bdfc2a922452abddd**" because he has not got a single question right in the test so we don't think he is ready for this test now.

```
a341f4641772b42ffb04b74522734d84
The recommended Tests are

['2a3789c4ea686289ee0f62b5d816588b' 'c0ece24d2d5c3893c5c96b8d645fcc92'
 'dfb896ae1ed198daa72758980ddc4efe']
```

- The student with Sid-"**a341f4641772b42ffb04b74522734d84**" has already appeared in the test "**a8d11a82ba438ea1dda0661e6a791de0**" but we have not recommended him that test because he has scored 38 in the test which is better compared to others so we have recommended him other tests of the super target group in which he is enrolled into. Those are Banking, Defense and police exams preparation ,
- The tests we have recommended are the most frequent tests taken are by the students who are enrolled in these super target groups.

Course Recommendation Analysis:

```
8b238dff38c160b4854b4f9066df49bc
The recommended courses are

ef9d7813d12149b672b574cb59a562ed
e46c8e4e08f7087ab2cc640f52609ece
b61d1b81d9c3881dbb7ecc38d4161f89
```

- The student "**8b238dff38c160b4854b4f9066df49bc**" is enrolled for the Bank Exam preparations and has not taken any course before so we are recommending him the courses"**ef9d7813d12149b672b574cb59a562ed**","**e46c8e4e08f7087ab2cc640f52609ece** ","**b61d1b81d9c3881dbb7ecc38d4161f89**" which are for bank exam preparations and already been taken by 12, 11 and 10 students respectively who are preparing for Bank exams and they are the most taken courses by the students of this super target group.

```
15698fb9e24f5b91646e0e6ecb8eb9e0
The recommended courses are

b61d1b81d9c3881dbb7ecc38d4161f89
0db2e72c48b89cdaa961666fcc20d5d8
df4b5cec8ecaef0e1308931ede355f99
```

- The Student "**8b238dff38c160b4854b4f9066df49bc**" is enrolled for Bank ,Defense and Police Exams preparation and has already taken "**e27d888f06487c279b3af905d1293646**" , "**857c42b22e8956f61afb3a470e85de03**" courses already, so we have not recommended him these courses we have recommended him "b61d1b81d9c3881dbb7ecc38d4161f89", "**0db2e72c48b89cdaa961666fcc20d5d8**","**df4b5cec8ecaef0e1308931ede355f99**" courses as these courses are most frequent courses for Bank , Defense and Police Exams Preparation respectively.

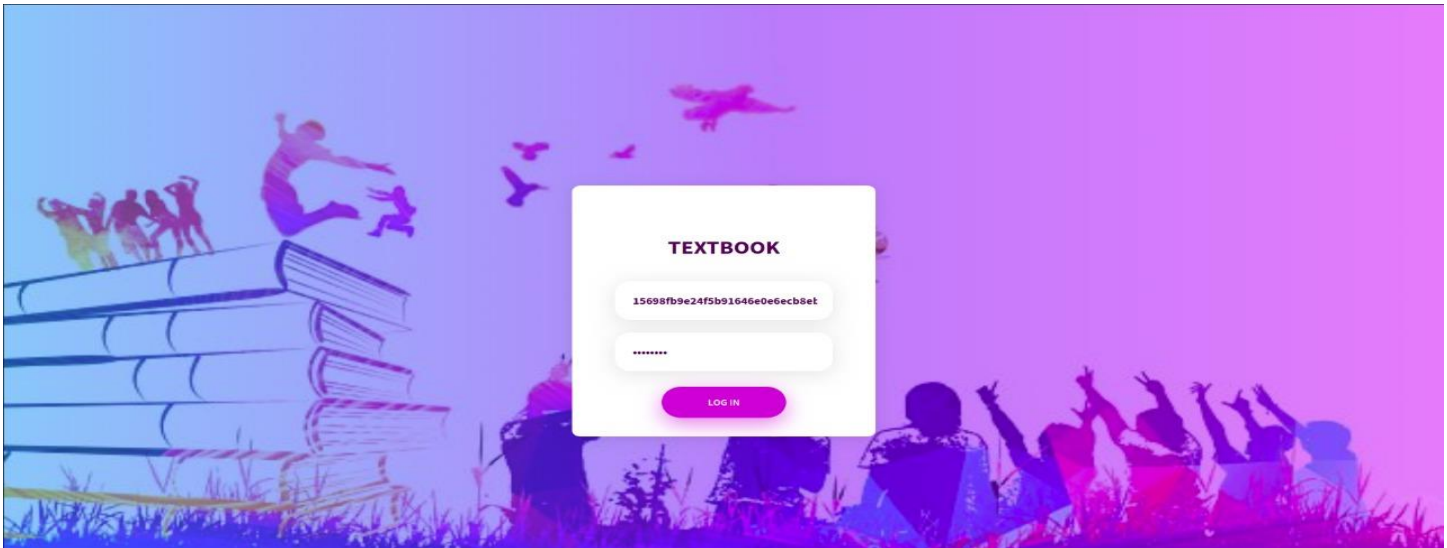
Our Implementation In Productive Environment:

Following is the link for the video to view our project and its results,

https://drive.google.com/file/d/1AblADostiYWHpdRQWgVEKvdBIksdqSwr/view?usp=sharing

We have Created the User Interface with Flask and we can apply our model similar to a reinforcement model The recommendation will change Automatically if there is any change in the database.We can easily use this code to recommend tests and courses as these codes have polynomial time complexity.

Images of our User Interface



COURSES RECOMMENDED

B61D1B81D9C3881DBB7ECC38D4161F89

0DB2E72C48B89CDAA961666FCC20D5D8

DF4B5CEC8ECAEF0E1308931EDE355F99

TESTS RECOMMENDED

DCF403B70447D14BDFC2A922452ABDDD

B4CA204631B17B6B486C361872FD2AF2

DFB896AE1ED198DAA72758980DDC4EFE