

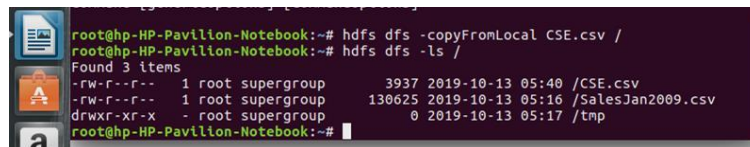
C V Raman Global University
Big Data Analytics Lab 6
PIG Classwork Assignment on Student Data Analysis

Copy the data files to hadoop:

```
hdfs dfs -copyFromLocal CSE.csv /
```

```
hdfs dfs -copyFromLocal Dept.csv /
```

Explanations: Above commands copy the files from local path (/home/cloudera) to root director (/)



A terminal window screenshot showing the execution of HDFS commands. The first command is `hdfs dfs -copyFromLocal CSE.csv /`. The second command is `hdfs dfs -ls /`, which outputs the following table:

Found 3 items						
-rw-r--r--	1	root	supergroup	3937	2019-10-13 05:40	/CSE.csv
-rw-r--r--	1	root	supergroup	130625	2019-10-13 05:16	/SalesJan2009.csv
drwxr-xr-x	-	root	supergroup	0	2019-10-13 05:17	/tmp

To check whether file is copied or not:

```
hdfs dfs -ls /
```

Load the data into pig:

```
cseData1 = LOAD '/CSE.csv' USING PigStorage(',') AS  
(Name:chararray, RollNo:int, Marks:int, City:chararray);
```

```
deptData1 = LOAD '/Dept.csv' USING PigStorage(',') AS  
(RollNo:int, Department:chararray, City:chararray,  
College:chararray);
```

```

grunt> cseData = LOAD 'CSE.csv' AS (Name:chararray, RollNo:int, Marks:int, City:chararray);
grunt> deptData = LOAD '.csv' AS (RollNo:int, Department:chararray, City:chararray, College:chararray);
grunt> █

```

a). To group the tuples of students based on city.

Ans:

groupByCity = GROUP cseData1 BY City;

```

grunt> groupByCity = GROUP cseData BY City;
grunt> █

```

dump groupByCity;

```

({(Guneet Bajaj,16103123,175,Pune,,),(Sanyam Dhawan,16103122,174,Pune,,),(Karan Chabra,16103121,173,Pune,,),(Gagandeep Chugh,16103120,172,Pune,,),(Sanyam Mehta,16103119,171,Pune,,),(Kanishk Gautam,16103118,170,Pune,,),(Harsimran Singh,16103117,169,Pune,,),(Vardaan Bajaj,16103116,168,Pune,,),(Simran Bajaj,16103115,167,Pune,,),(Pranita,16103113,166,Pune,,),(Tanishq Mittal,16103112,165,Pune,,),(Kunal Gupta,16103111,164,Pune,,),(Shubhkarmadeep Kaur,16103110,163,Pune,,),(Muskan Sharma,16103109,162,Pune,,),(Shagundeep Singh,16103108,161,Pune,,),(Neeti Jethlia,16103107,160,Pune,,),(Bhalinder Singh Munier,16103106,159,Pune,,),(Kainaath,16103105,158,Pune,,),(Lovedeep Singh,16103104,157,Pune,,),(Pragun Aggarwal,16103103,156,Pune,,),(Sahil Bhardwaj,16103102,155,Pune,,),(Abhishek Garg,16103101,154,Gujrat,,),(Shivam Jand,16103100,153,Gujrat,,),(Raghav Sharma,16103099,152,Gujrat,,),(Kshittij Porwal,16103098,151,Gujrat,,),(Abhishek,16103097,150,Gujrat,,),(Dhruv Guleria,16103096,149,Gujrat,,),(Akshant Sarmal,16103095,148,Chennai,,),(Kanika Sharma,16103094,147,Himachal,,),(Abhinav Thakur,16103093,146,Chennai,,),(Noordeep Kaur,16103091,145,Chennai,,),(Prabhnor Kaur,16103090,144,Chennai,,),(Srishti,16103089,143,Chennai,,),(Divya Sehgal,16103087,142,Chennai,,),(Anil Kumar,16103086,141,Chennai,,),(Gurvinder Singh,16103085,140,Chennai,,),(Riyanka Mondal,16103084,139,Chennai,,),(Priyam,16103083,138,Chennai,,),(Shubam Bharti,16103082,137,Chennai,,),(Akshat Kasana,16103081,136,Chennai,,),(Smiley Rana,16103080,135,Chennai,,),(Prabhjot Kaur,16103079,134,Chennai,,),(Navdeep Kaur,16103078,133,Chennai,,),(Tamanna Puaar,16103077,132,Chennai,,),(Gurasees Singh,16103076,131,Chennai,,),(Vasudha,16103075,130,Chennai,,),(Chandan Mishra,16103074,129,Chennai,,),(Divyansh Singh,16103073,128,Chennai,,),(Nitin Kashyap,16103072,127,Chennai,,),(Aman Dhamija,16103071,126,Pune,,),(Shreya,16103070,125,Pune,,),(Vaibhav Setia,16103069,124,Pune,,),(Anoushka Atlawadi,16103068,123,Pune,,),(Sidharth Verma,16103067,122,Pune,,),(Niharika Yadav,16103066,121,Pune,,),(Himani,16103065,120,Pune,,),(Ishaan Kanwar,16103064,119,Pune,,),(Archit Singal,16103063,118,Pune,,),(Paritosh Malhotra,16103062,117,Pune,,),(Sumit Ranjan,16103061,116,Pune,,),(Avantika,16103060,115,Pune,,),(Yashasvi Chaudhary,16103059,114,Pune,,),(Mehul Narang,16103057,113,Pune,,),(Ishita Agarwal,16103056,112,Pune,,),(Aanshi Bansal,16103055,111,Pune,,),(Robin Thakur,16103054,110,Pune,,),(Gaurav Singh,16103053,109,Pune,,),(Shirish Gupta,16103052,108,Pune,,),(Sunpriya Kaur Bhatia,16103051,107,Pune,,),(Aditya Sharma,16103050,106,Pune,,),(Deepti,16103049,105,Pune,,),(Abhinav Narang,16103048,104,Pune,,),(Kushal Dudeja,16103047,103,Pune,,),(Abhinav Chawla,16103046,102,Pune,,),(Parikh Oberoi,16103045,101,Pune,,),(Vaibhav Goel,16103044,100,Pune,,),(Pritish Gupta,16103043,99,Panjab,,),(Nirmaljit Singh,16103042,98,Panjab,,),(Madhav Pruthi,16103041,97,Panjab,,),(Chetna Gupta,16103040,96,Panjab,,),(Kartik Kaushal,16103039,95,Panjab,,),(Shivam Sehgal,16103037,94,Panjab,,),(Mayank Saggarr,16103036,93,Panjab,,),(Krittika Chhabra,16103035,92,Panjab,,),(Arshdeep Singh Sachdeva,16103034,91,Panjab,,),(Priyanshu Sharma,16103033,90,Panjab,,),(Baljinder Singh,16103032,89,Panjab,,),(Janandeep Singh,16103031,88,Himachal,,),(Harshita Singla,16103030,87,Himachal,,),(Leevansha,16103029,86,Himachal,,),(Aakanksha Sharma,16103028,85,Himachal,,),(Ritesh Goyal,16103027,84,Himachal,,),(Dhanwant Kaur,16103026,83,Himachal,,),(Rohan Dhadwal,16103025,82,Himachal,,),(Arunav Sharma,16103024,81,Chandigarh,,),(Pradhuman Goyal,16103023,80,Chandigarh,,),(Nikita Gupta,16103022,79,Chandigarh,,),(Mankeerat Singh,16103021,78,Chandigarh,,),(Ishneet Kaur,16103020,77,Chandigarh,,),(Muskan Garg,16103019,76,Chandigarh,,),(Pranjali,16103018,75,Chandigarh,,),(Deepak Tiwari,16103017,74,Chandigarh,,),(Gaurav Ahuja,16103016,73,Chandigarh,,),(Abhinav Agarwal,16103015,72,New Delhi,,),(Shounak Chowdhury,16103014,71,New Delhi,,),(Abhinav Singla,16103013,70,Chandigarh,,),(Sparsch Garg,16103012,69,Chandigarh,,),(Sarthaak Vaswani,16103011,68,New Delhi,,),(Pradeep Parajuli,16103010,67,New Delhi,,),(Ramesh Chandra Pokharel,16103008,66,New Delhi,,),(Nikhat Parveen,16103007,65,New Delhi,,),(Sanjana Koul,16103006,64,New Delhi,,),(Rajesh Jha,16103004,63,Hyderabad,,),(Prayag Panta,16103003,62,Hyderabad,,),(Sidharth Bhandari,16103001,61,Hyderabad,,),(Name,RollNo,Marks,City,,))
grunt> █

```

b). To display the name of all students in upper case.

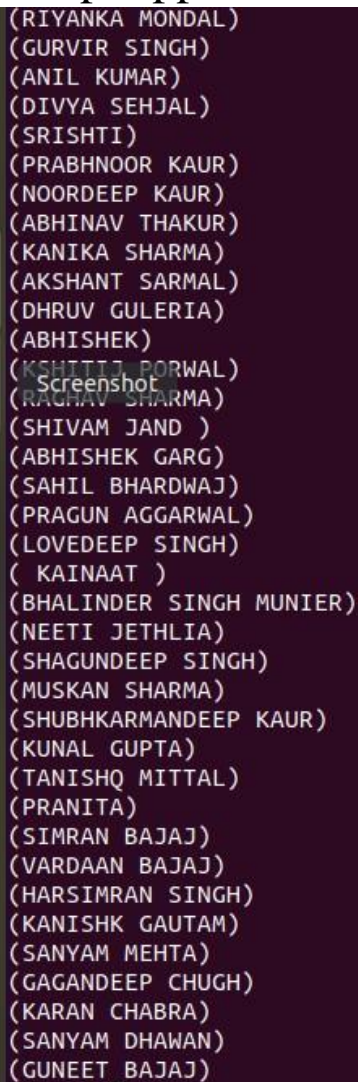
Ans: upperCaseNames = FOREACH cseData1 GENERATE UPPER(Name);

```

grunt> upperCaseNames = FOREACH cseData GENERATE UPPER(Name);
grunt> █

```

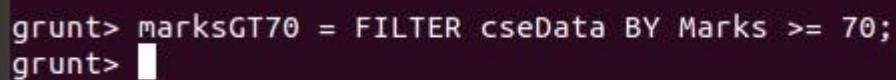
```
dump upperCaseNames;
```



A screenshot of a terminal window with a dark background and light green text. It displays a list of 40 student names in uppercase, each enclosed in parentheses. The names are: (RIYANKA MONDAL), (GURVIR SINGH), (ANIL KUMAR), (DIVYA SEHJAL), (SRISHTI), (PRABHNOOR KAUR), (NOORDEEP KAUR), (ABHINAV THAKUR), (KANIKA SHARMA), (AKSHANT SARMAL), (DHRUV GULERIA), (ABHISHEK), (KSHITIJ PORWAL), (RACHAV SHARMA), (SHIVAM JAND), (ABHISHEK GARG), (SAHIL BHARDWAJ), (PRAGUN AGGARWAL), (LOVEDEEP SINGH), (KAINAAT), (BHALINDER SINGH MUNIER), (NEETI JETHLIA), (SHAGUNDEEP SINGH), (MUSKAN SHARMA), (SHUBHKARMANDEEP KAUR), (KUNAL GUPTA), (TANISHQ MITTAL), (PRANITA), (SIMRAN BAJAJ), (VARDAAN BAJAJ), (HARSIMRAN SINGH), (KANISHK GAUTAM), (SANYAM MEHTA), (GAGANDEEP CHUGH), (KARAN CHABRA), (SANYAM DHAWAN), and (GUNEET BAJAJ).

c). To find the tuples of those students where the marks is greater than equal to 70.

Ans: marksGT70 = FILTER cseData1 BY Marks >= 70;



A screenshot of a terminal window with a dark background and light green text. It shows two lines of code: 'grunt> marksGT70 = FILTER cseData BY Marks >= 70;' followed by 'grunt>' on the next line with a cursor.

```
dump marksGT70;
```



```
(Abhinav Singla,16103013,70,Chandigarh)
(Shounak Chowdhury ,16103014,71,New Delhi)
(Abhinav Agarwal,16103015,72,New Delhi)
(Gaurav Ahuja,16103016,73,Chandigarh)
(Deepak Tiwari,16103017,74,Chandigarh)
(Pranjali,16103018,75,Chandigarh)
(Muskan Garg,16103019,76,Chandigarh)
(Ishneet Kaur,16103020,77,Chandigarh)
(Mankeerat Singh ,16103021,78,Chandigarh)
(Nikita Gupta,16103022,79,Chandigarh)
(Pradhuman Goyal,16103023,80,Chandigarh)
(Arunav Sharma,16103024,81,Chandigarh)
(Rohan Dhadwal,16103025,82,Himachal)
(Dhanwant Kaur,16103026,83,Himachal)
(Ritesh Goyal,16103027,84,Himachal)
(Aakankasha Sharma,16103028,85,Himachal)
(Leevansha,16103029,86,Himachal)
(Harshima Singla,16103030,87,Himachal)
(Janamdeep Singh,16103031,88,Himachal)
(Baljinder Singh,16103032,89,Panjab)
(Priyanshu Sharma,16103033,90,Panjab)
(Arshdeep Singh Sachdeva,16103034,91,Panjab)
(Krittika Chhabra,16103035,92,Panjab)
(Mayank Saggarr,16103036,93,Panjab)
(Shivam Sehgal,16103037,94,Panjab)
(Kartik Kaushal,16103039,95,Panjab)
(Chetna Gupta,16103040,96,Panjab)
(Madhav Pruthi,16103041,97,Panjab)
(Nirmaljot Singh,16103042,98,Panjab)
(Pritish Gupta,16103043,99,Panjab)
(Vaibhav Goel,16103044,100,Pune)
(Parikh Oberoi,16103045,101,Pune)
(Abhinav Chawla,16103046,102,Pune)
(Kushal Dudeja,16103047,103,Pune)
(Abhinav Narang,16103048,104,Pune)
(Deepti,16103049,105,Pune)
(Aditya Sharma,16103050,106,Pune)
```

d). To get details of students who belongs to New Delhi only.

Ans: NewDelhiStudents = FILTER cseData1 BY City == 'New Delhi';

```
grunt> NewDelhiStudents = FILTER cseData BY City == 'New Delhi';
grunt> █
```

dump NewDelhiStudents;

```
(Sanjana Koul,16103006,64,New Delhi)
(Nikhat Parveen,16103007,65,New Delhi)
(Ramesh Chandra Pokharel,16103008,66,New Delhi)
(Pradeep Parajuli,16103010,67,New Delhi)
(Sarthak Vaswani,16103011,68,New Delhi)
(Shounak Chowdhury ,16103014,71,New Delhi)
(Abhinav Agarwal,16103015,72,New Delhi)
grunt> █
```

e). To display the results where the city name Chandigarh is replaced with shorter form CHD and New Delhi with NDLS.

```
replacedData = FOREACH cseData GENERATE  
REPLACE(REPLACE(City,'Chandigarh','CHD'), 'New  
Delhi','NDLS');
```

```
grunt> replacedData = FOREACH cseData GENERATE REPLACE(REPLACE(City,'Chandigarh','CHD'), 'New Delhi','NDLS');
grunt>
```

```
dump replacedData;
```

[illegible]

f). To calculate average marks for each student.

To do so execute the following

Group the students by Roll number:

marksByStudent = GROUP cseData1 BY RollNo;

```
grunt> marksByStudent = GROUP cseData BY RollNo;  
grunt> █
```

dump marksByStudent;

```
(16103085,{{Gurvir Singh,16103085,140,Chennai}})  
(16103086,{{Anil Kumar,16103086,141,Chennai}})  
(16103087,{{Divya Sehjal,16103087,142,Chennai}})  
(16103089,{{Srishti,16103089,143,Chennai}})  
(16103090,{{Prabhnoor Kaur,16103090,144,Chennai}})  
(16103091,{{Noordeep Kaur,16103091,145,Chennai}})  
(16103093,{{Abhinav Thakur,16103093,146,Chennai}})  
(16103094,{{Kanika Sharma,16103094,147,Himachal}})  
(16103095,{{Akshant Sarmal,16103095,148,Chennai}})  
(16103096,{{Dhruv Guleria,16103096,149,Gujrat}})  
(16103097,{{Abhishek,16103097,150,Gujrat}})  
(16103098,{{Kshitij Porwal,16103098,151,Gujrat}})  
(16103099,{{Raghav Sharma,16103099,152,Gujrat}})  
(16103100,{{Shivam Jand ,16103100,153,Gujrat}})  
(16103101,{{Abhishek Garg,16103101,154,Gujrat}})  
(16103102,{{Sahil Bhardwaj,16103102,155,Pune}})  
(16103103,{{Pragun Aggarwal,16103103,156,Pune}})  
(16103104,{{Lovedeep Singh,16103104,157,Pune}})  
(16103105,{{Kainaath,16103105,158,Pune}})  
(16103106,{{Bhalinder Singh Munier,16103106,159,Pune}})  
(16103107,{{Neeti Jethlia,16103107,160,Pune}})  
(16103108,{{Shagundeep Singh,16103108,161,Pune}})  
(16103109,{{Muskan Sharma,16103109,162,Pune}})  
(16103110,{{Shubhkarmadeep Kaur,16103110,163,Pune}})  
(16103111,{{Kunal Gupta,16103111,164,Pune}})  
(16103112,{{Tanishq Mittal,16103112,165,Pune}})  
(16103113,{{Pranita,16103113,166,Pune}})  
(16103115,{{Simran Bajaj,16103115,167,Pune}})  
(16103116,{{Vardaan Bajaj,16103116,168,Pune}})  
(16103117,{{Harsimran Singh,16103117,169,Pune}})  
(16103118,{{Kanishk Gautam,16103118,170,Pune}})  
(16103119,{{Sanyam Mehta,16103119,171,Pune}})  
(16103120,{{Gagandeep Chugh,16103120,172,Pune}})  
(16103121,{{Karan Chabra,16103121,173,Pune}})  
(16103122,{{Sanyam Dhawan,16103122,174,Pune}})  
(16103123,{{Guneet Bajaj,16103123,175,Pune}})  
(,{Name,,,City})  
█
```

Calculate average for each group:

avgMarks = FOREACH marksByStudent GENERATE group AS RollNo, AVG(cseData1.Marks) AS avgMark;

```
grunt> avgMarks = FOREACH marksByStudent GENERATE group AS RollNo, AVG(cseData.Marks) AS avgMark;  
grunt>  
grunt> █
```

dump avgMarks;

```
(16103085,140.0)  
(16103086,141.0)  
(16103087,142.0)  
(16103089,143.0)  
(16103090,144.0)  
(16103091,145.0)  
(16103093,146.0)  
(16103094,147.0)  
(16103095,148.0)  
(16103096,149.0)  
(16103097,150.0)  
(16103098,151.0)  
(16103099,152.0)  
(16103100,153.0)  
(16103101,154.0)  
(16103102,155.0)  
(16103103,156.0)  
(16103104,157.0)  
(16103105,158.0)  
(16103106,159.0)  
(16103107,160.0)  
(16103108,161.0)  
(16103109,162.0)  
(16103110,163.0)  
(16103111,164.0)  
(16103112,165.0)  
(16103113,166.0)  
(16103115,167.0)  
(16103116,168.0)  
(16103117,169.0)  
(16103118,170.0)  
(16103119,171.0)  
(16103120,172.0)  
(16103121,173.0)  
(16103122,174.0)  
(16103123,175.0)
```

i). To merge contents of two relation CSE.csv and Dept.csv. Ans:
mergeRelation = JOIN cseData1 BY RollNo, deptData1 BY RollNo;


```
grunt> mergeRelation = JOIN cseData BY RollNo, deptData BY RollNo;
grunt> █
```

dump mergeRelation;

```
(Riyanka Mondal,16103084,139,Chennai,16103084,Computer Science,Chennai,PEC)
(Gurvir singh,16103085,140,Chennai,16103085,Computer Science,Chennai,PEC)
(Anil Kumar,16103086,141,Chennai,16103086,Computer Science,Chennai,PEC)
(Divya Sehjal,16103087,142,Chennai,16103087,Computer Science,Chennai,PEC)
(Srishti,16103089,143,Chennai,16103089,Computer Science,Chennai,PEC)
(Prabhnor Kaur,16103090,144,Chennai,16103090,Electronics,Chennai,PEC)
(Noordeep Kaur,16103091,145,Chennai,16103091,Electronics,Chennai,PEC)
(Abhinav Thakur,16103093,146,Chennai,16103093,Electronics,Chennai,PEC)
(Kanika Sharma,16103094,147,Himachal,16103094,Electronics,Himachal,PEC)
(Akshant Sarmal,16103095,148,Chennai,16103095,Electronics,Chennai,PEC)
(Dhruv Guleria,16103096,149,Gujrat,16103096,Electronics,Gujrat,PEC)
(Abhishek,16103097,150,Gujrat,16103097,Electronics,Gujrat,PEC)
(Kshiti Porwal,16103098,151,Gujrat,16103098,Electronics,Gujrat,PEC)
(Raghav Sharma,16103099,152,Gujrat,16103099,Electronics,Gujrat,PEC)
(Shivam Jand ,16103100,153,Gujrat,16103100,Electronics,Gujrat,PEC)
(Abhishek Garg,16103101,154,Gujrat,16103101,Electronics,Gujrat,PEC)
(Sahil Bhardwaj,16103102,155,Pune,16103102,Electronics,Pune,PEC)
(Pragun Aggarwal,16103103,156,Pune,16103103,Computer Science,Pune,PEC)
(Lovedeep Singh,16103104,157,Pune,16103104,Computer Science,Pune,PEC)
( Kainaath ,16103105,158,Pune,16103105,Computer Science,Pune,PEC)
(Bhalinder Singh Munier,16103106,159,Pune,16103106,Computer Science,Pune,PEC)
(Neeti Jethlia,16103107,160,Pune,16103107,Computer Science,Pune,PEC)
(Shagundeep Singh,16103108,161,Pune,16103108,Computer Science,Pune,PEC)
(Muskan Sharma,16103109,162,Pune,16103109,Computer Science,Pune,PEC)
(Shubhkarmandeep Kaur,16103110,163,Pune,16103110,Computer Science,Pune,PEC)
(Kunal Gupta,16103111,164,Pune,16103111,Computer Science,Pune,PEC)
(Tanishq Mittal,16103112,165,Pune,16103112,Computer Science,Pune,PEC)
(Pranita,16103113,166,Pune,16103113,Computer Science,Pune,PEC)
(Simran Bajaj,16103115,167,Pune,16103115,Computer Science,Pune,PEC)
(Vardaan Bajaj,16103116,168,Pune,16103116,Mechanical,Pune,PEC)
(Harshman Singh,16103117,169,Pune,16103117,Mechanical,Pune,PEC)
(Kanishk Gautam,16103118,170,Pune,16103118,Mechanical,Pune,PEC)
(Sanyam Mehta,16103119,171,Pune,16103119,Mechanical,Pune,PEC)
(Gagandeep Chugh,16103120,172,Pune,16103120,Mechanical,Pune,PEC)
(Karan Chabra,16103121,173,Pune,16103121,Civil,Pune,PEC)
(Sanyam Dhawan,16103122,174,Pune,16103122,Civil,Pune,PEC)
(Guneet Bajaj,16103123,175,Pune,16103123,Civil,Pune,PEC)
```

j). To display the details of students who belongs to computer Science only.

: CSEstudents = FILTER mergeRelation BY Department ==
'Computer Science';

```
grunt> CSEstudents = FILTER mergeRelation BY Department == 'Computer Science';
grunt> █
```


dump CSEstudents;

```
(Sidharth Bhandari,16103001,61,Hyderabad,16103001,Computer Science,Hyderabad,PEC)
(Prayag Panta,16103003,62,Hyderabad,16103003,Computer Science,Hyderabad,IIT Roorkee)
(Rajesh Jha,16103004,63,Hyderabad,16103004,Computer Science,Hyderabad,IIT Roorkee)
(Sanjana Koul,16103006,64,New Delhi,16103006,Computer Science,New Delhi,IIT Roorkee)
(Nikhat Parveen,16103007,65,New Delhi,16103007,Computer Science,New Delhi,IIT Roorkee)
(Ramesh Chandra Pokharel,16103008,66,New Delhi,16103008,Computer Science,New Delhi,IIT Roorkee)
(Pradeep Parajuli,16103010,67,New Delhi,16103010,Computer Science,New Delhi,IIT Roorkee)
(Sarthak Vaswani,16103011,68,New Delhi,16103011,Computer Science,New Delhi,IIT Roorkee)
(Sparsh Garg,16103012,69,Chandigarh,16103012,Computer Science,Chandigarh,IIT Roorkee)
(Abhinav Singla,16103013,70,Chandigarh,16103013,Computer Science,Chandigarh,IIT Roorkee)
(Shounak Chowdhury ,16103014,71,New Delhi,16103014,Computer Science,New Delhi,IIT Roorkee)
(Arshdeep Singh Sachdeva,16103034,91,Panjab,16103034,Computer Science,Panjab,NITTTR Chandigarh)
(Krittika Chhabra,16103035,92,Panjab,16103035,Computer Science,Panjab,NITTTR Chandigarh)
(Mayank Saggat,16103036,93,Panjab,16103036,Computer Science,Panjab,NITTTR Chandigarh)
(Shivam Sehgal,16103037,94,Panjab,16103037,Computer Science,Panjab,NITTTR Chandigarh)
(Kartik Kaushal,16103039,95,Panjab,16103039,Computer Science,Panjab,NITTTR Chandigarh)
(Chetna Gupta,16103040,96,Panjab,16103040,Computer Science,Panjab,NITTTR Chandigarh)
(Madhav Pruthi,16103041,97,Panjab,16103041,Computer Science,Panjab,IIT Delhi)
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