



UNIVERSITY MANAGEMENT SYSTEM

SUBMITTED TO- Dr. Santosh Singh Rathore

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ROLL NO – 2021BCS-071

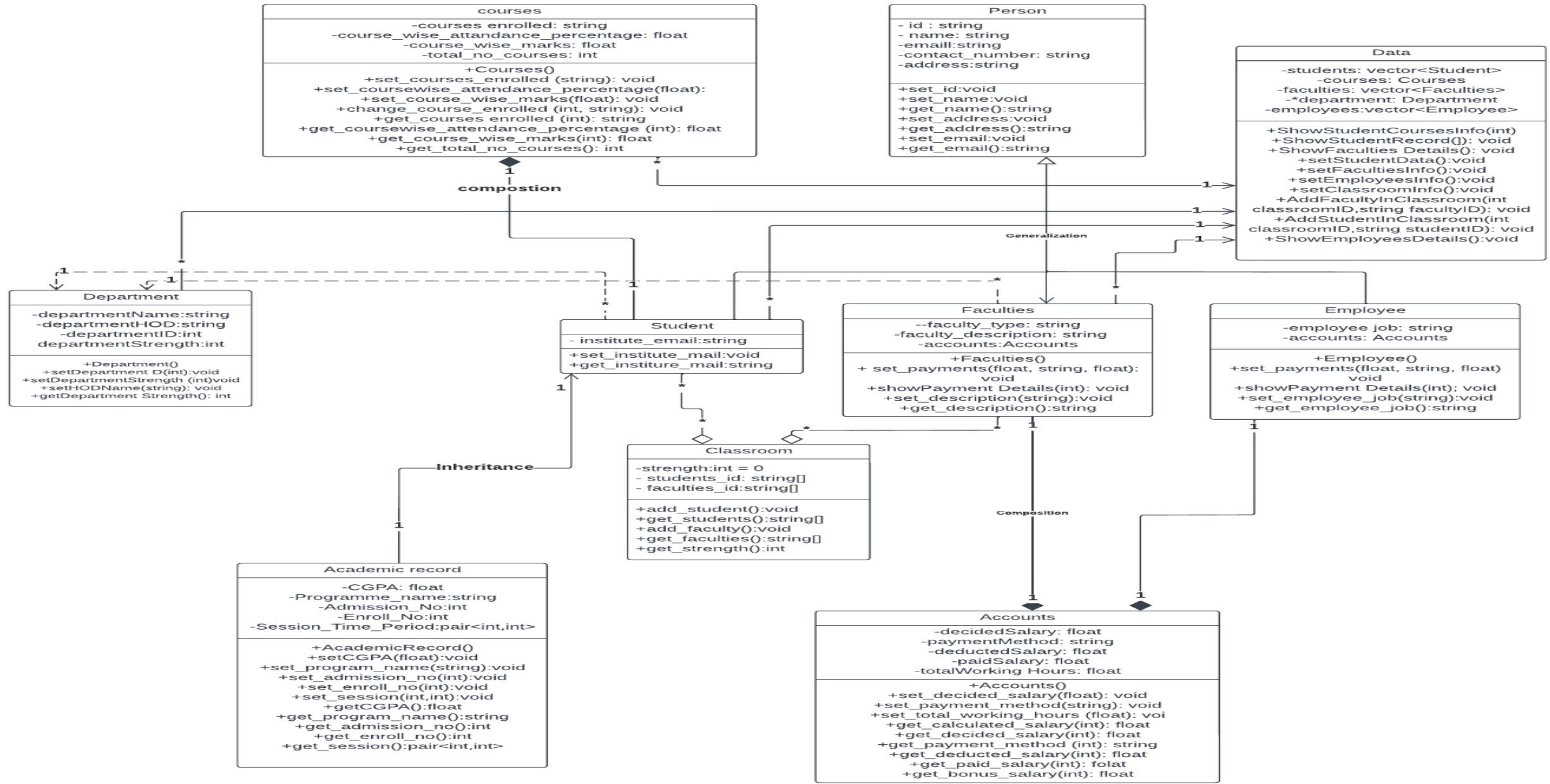
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UML CLASS DIAGRAM:-



Explanation:-

We are building a University Management System, in which we have functionalities for:-

1. **Add** a new student in the university
2. **Show** the details of all students
3. **Show** the Academic Record of all students
4. **Show** the Courses opted by a particular student
5. **Add** a new faculty in the university
6. **Show** the details of all faculties in university
7. **Show** the details of accounts of all faculties
8. **Add** a new employee in the university
9. **Show** the details of all employees in university
10. **Show** the details of accounts of a particular employee

For this we have a :-

1. Person class:-

- **Person class is in Person.h header file.**
- **This is a parent class to Student, Faculties and Employees class as every person has the common characteristics and actions of a Person instance.**
- **Data Members are:-**
 - **- id : string**
 - **- name: string**
 - **-email:string**
 - **-contact_number: string**
 - **-address:string**

All these data members are in private scope.

- **Member functions are the usual setters and getters for these data members in public scope.**
- **There is a Generalization from Student, Faculties and Employees to Person class.**

2. Department:-

- **Department class is in Department.h header file.**
- **Department class has a dependency to Student and Faculties class, there can't exist a Department with 0 student or 0 Faculty in it.**
- **Department hence is a abstract class in this sense.**
- **Data Members are:-**
 - **string departmentName;**
 - **string departmentHOD;**
 - **string departmentID; //ID of the department**
 - **int departmentStrength;**

All data members are in private scope.

3. Academic Record:-

- **AcademicRecord** is being inherited by **Student** class.
- Every student has a unique Academic Record, no Academic Record can be same of two different students
- **Data Members** are:-
 - **string** programme_name; //Like B.TECH CSE
 - **int** admission_no;
 - **int** enroll_no;
 - **pair<int,int>** session_time_period; //duration of program like (2020-2024)
 - **float** CGPA;
 - **int** total_credits;

4. Courses :-

- Courses contain the information regarding the courses picked by a unique student in the university

5. Student:-

- Student class is in Student.h header file.
- The parent class of Student class are Academic Record, Person and Department.
- Student class has a composition to Courses class, as every student has some select courses opted by him.
- The Addition Data Member:-
 - **Institute_Mail**: string
 - **A** :Course class

6. Accounts

- **Accounts** is in Accounts.h header file.
- **Accounts** contain all information regarding salary, payment method for an employee/faculty of the University.
- **Data Members**:-
 - **float** decidedSalary;
 - **string** paymentMethod;
 - **float** deductedSalary;
 - **float** bonusSalary;
 - **float** paidSalary; //to be calculated from other data members
 - **float** totalWorkingHours;

7. Faculties:-

- Faculties class is for storing all the characteristics and functionalities regarding various function managing faculties in a university.
- Faculties has a composition to Accounts, as every has unique account details associated to them.
- Data Members:-
 - **string faculty_type;**
 - **string faculty_description;**
 - **Accounts accounts;**
- All data members are in private scope.

8. Employee

- Employee class is for storing all the characteristics and functionalities regarding various function managing employees in a university.
- Employee has a composition to Accounts, as every has unique account details associated to them.
- Data Members:-
 - **string employee_job;**
 - **Accounts accounts;**
- All data members are in private scope.

9. Classroom

- This class contains information of a unique class in the university
- Data Members:-
 - **int strength; //total num of students**
 - **vector<string> students_id; //list of ID of students in the class**
 - **vector<string> faculties_id; //list of ID of faculties in the class**
 - **int classroom_id; //used as unique identifier for a classroom**

These data members are in private scope.

10. Display

- This is the central class for our management system, which contains most of the functionality for University Management System.
- Data Members:-
 - **vector<Student> students;**
 - **Courses courses; //this data members is extra**
 - **vector<Faculties> faculties;**
 - **vector<Employee> employees;**
 - **vector<Classroom> classrooms;**

Above data members are in private scope.

- **int total_students = 0;**
- **int total_faculties = 0;**

These data members are in public scope.

Output:-

```
vivekup3424@vivekup3424-Inspiron-15-3567: /media/vivekup3424/New Volume/
```

```
University Management System
```

```
Click the options to do desired results:
```

- 1.Add a new student in the university
- 2.Show the details of all students
- 3.Show the Academic Record of all students
- 4.Show the Courses opted by a particular student
- 5.Add a new faculty in the university
- 6.Show the details of all faculties in university
- 7.Show the details of accounts of all faculties
- 8.Add a new employee in the university
- 9.Show the details of all employees in university
- 10.Show the details of accounts of a particular employee
- 11?.Add a new department in the university
- 12?.Show all the department in the university
- 13.Add a new classroom in the university
- 14.Add a new student in a classroom
- 15.Add a new faculty in a classroom
- 16.Show all the classrooms in the university
- 17.Enter to exit program.

```
-----
```

```
1
```

```
Enter the number of students: 3
```

```
For student 1
```

```
Enter the following:
```

```
ID: ABC123
```

```
Name: VIVEK_UPADHYAY
```

```
Email: viveku920@gmail.com
```

```
Contact Number: 6260863371
```

```
Address: Room-019,BH-1,IIITM_CAMPUS,IIITM_Gwalior
```

```
Institute EMail: bcs_2021071@iiitm.ac.in
```

```
-----COURSES-----
```

```
Enter the Course Details:
```

```
Enter the number of courses: 4
```

```
Enter the following for each course 1 :
```

```
Course Name: OOPS
```

```
Marks: 56
```

Output:-

```
Marks: 56
Attendance Percentage: 86
Enter the following for each course 2 :
Course Name: DAA
Marks: 68
Attendance Percentage: 86
Enter the following for each course 3 :
Course Name: OS
Marks: 88
Attendance Percentage: 76
Enter the following for each course 4 :
Course Name: COA
Marks: 66
Attendance Percentage: 69

-----ACADEMIC RECORD-----
Enter the Academic Record Details:
Program_name: B.Tech
Admission Number: 12345
Erollment Number: 71
Course Begin Year: 2021
Course End Year: 2025
Credits: 140
CGPA: 8.9
For student 2
Enter the following:
ID: ABC124
Name: Harsh_Jha
Email: harshJha12@gmail.com
Contact Number: 9162678553
Address: Room-260,BH-1,IIITM_CAMPUS,IIITM_Gwalior
Institute EMail: bcs_2021078.iiitm.ac.in

-----COURSES-----
Enter the Course Details:
Enter the number of courses: 4
```


Output:-

```
Enter the following for each course 1 :
Course Name: OOPS
Marks: 76
Attendance Percentage: 89
Enter the following for each course 2 :
Course Name: DAA
Marks: 79
Attendance Percentage: 99
Enter the following for each course 3 :
Course Name: OS
Marks: 95
Attendance Percentage: 96
Enter the following for each course 4 :
Course Name: COA
Marks: 86
Attendance Percentage: 45

-----ACADEMIC RECORD-----
Enter the Academic Record Details:
Program_name: B.Tech
Admission Number: 456578
Erollment Number: 78
Course Begin Year: 2021
Course End Year: 2025
Credits: 149
CGPA: 9.7
For student 3
Enter the following:
ID: ABC125
Name: Anup Singh
EMail: Contact Number: 6202907787
Address: Room-234,BH-1,IIIM_CAMPUS
Institute EMail: bcs_2021016.iiitm.ac.in

-----COURSES-----
Enter the Course Details:
Enter the number of courses: 4
Enter the following for each course 1 :
```

Output:-

```
-----COURSES-----
Enter the Course Details:
Enter the number of courses: 4
Enter the following for each course 1 :
Course Name: OOPS
Marks: 66
Attendance Percentage: 79
Enter the following for each course 2 :
Course Name: DAA
Marks: 79
Attendance Percentage: 6
Enter the following for each course 3 :
Course Name: COA
Marks: 56
Attendance Percentage: 91
Enter the following for each course 4 :
Course Name: OS
Marks: 76
Attendance Percentage: 86

-----ACADEMIC RECORD-----
Enter the Academic Record Details:
Program_name: B.Tech_CSE
Admission Number: 45678
Enrollment Number: 16
Course Begin Year: 2021
Course End Year: 2025
Credits: 140
CGPA: 8.5
Enter 'y' to continue or Enter 'n' to exit the program.
y
University Management System
Click the options to do desired results:
1.Add a new student in the university
2.Show the details of all students
3.Show the Academic Record of all students
4.Show the Courses opted by a particular student
5.Add a new faculty in the university
```

Output:-

University Management System

Click the options to do desired results:

- 1.Add a new student in the university
- 2.Show the details of all students
- 3.Show the Academic Record of all students
- 4.Show the Courses opted by a particular student
- 5.Add a new faculty in the university
- 6.Show the details of all faculties in university
- 7.Show the details of accounts of all faculties
- 8.Add a new employee in the university
- 9.Show the details of all employees in university
- 10.Show the details of accounts of a particular employee
- 11?.Add a new department in the university
- 12?.Show all the department in the university
- 13.Add a new classroom in the university
- 14.Add a new student in a classroom
- 15.Add a new faculty in a classroom
- 16.Show all the classrooms in the university
- 17.Enter to exit program.

2

ID	Name	Email	Contact_Number	Address	Insti_Email
ABC123	VIVEK_UPADHYAY	viveku920@gmail.com	6260863371	Room-019,BH-1,IIITM_CAMPUS,	IIITM_Gwaliorbcs_2021071@iiitm.ac.in
ABC124	Harsh_Jha	harshJha12@gmail.com	9162678553	Room-260,BH-1,IIITM_CAMPUS,	IIITM_Gwaliorbcs_2021078.iiitm.ac.in
ABC125	Anup Singh	6202907787	Room-234,BH-1,IIIM_CAMPUS	bcs_2021016.iiitm.ac.in	

Enter 'y' to continue or Enter 'n' to exit the program.

Output:-

```
vivekup3424@vivekup3424-Inspiron-15-3567:/media/vivekup3424/New Volume/IIITM Gwalior/S
ce
University Management System
Click the options to do desired results:
1.Add a new student in the university
2.Show the details of all students
3.Show the Academic Record of all students
4.Show the Courses opted by a particular student
5.Add a new faculty in the university
6.Show the details of all faculties in university
7.Show the details of accounts of all faculties
8.Add a new employee in the university
9.Show the details of all employees in university
10.Show the details of accounts of a particular employee
12.Show all the department in the university
13.Add a new classroom in the university
14.Add a new student in a classroom
15.Add a new faculty in a classroom
16.Show all the classrooms in the university
17.Enter to exit program.
-----
5
Enter the number of faculties: 2
For faculty 1 Enter the following:
ID: CD11
Name: Jagmohan_Sharma
EMail: JMS123@gmail.com
Contact Number 4567894261
Address: IIITM_Campus,IIITM_Gwalior
Faculty Type: Lecturer
Faculty Description: Teaches_Compiler_Design

-----ACCOUNTS-----
Enter Accounts details:
Decided_Salary  Payment_Method  Total_Working_Hours
```


Output:-

```
-----ACCOUNTS-----
Enter Accounts details:
Decided_Salary   Payment_Method   Total_Working_Hours
Decided_Salary: 60000
Payment_Method: NEFT
Total_Working_Hours: 800
For faculty 2 Enter the following:
ID: DB11
Name: Satish_Kumar
EMail: diamondGamer@gmail.com
Contact Number 9586758542
Address: IIITM_Campus,IIITM_Gwalior
Faculty Type: Associate_Professor
Faculty Description: Teaches_DBMS

-----ACCOUNTS-----
Enter Accounts details:
Decided_Salary   Payment_Method   Total_Working_Hours
Decided_Salary: 40000
Payment_Method: Online_Banking
Total_Working_Hours: 1200
Enter 'y' to continue or Enter 'n' to exit the program.
y
University Managment System
Click the options to do desired results:
1.Add a new student in the university
2.Show the details of all students
3.Show the Academic Record of all students
4.Show the Courses opted by a particular student
5.Add a new faculty in the university
6.Show the details of all faculties in university
7.Show the details of accounts of all faculties
8.Add a new employee in the university
9.Show the details of all employees in university
```

Output:-

```
8.Add a new employee in the university
9.Show the details of all employees in university
10.Show the details of accounts of a particular employee
12.Show all the department in the university
13.Add a new classroom in the university
14.Add a new student in a classroom
15.Add a new faculty in a classroom
16.Show all the classrooms in the university
17.Enter to exit program.
```

6

-----FACULTIES DETAIL-----

ID	Name	Email	Contact-Number	Address	Faculty-Type	Faculty-Desc
CD11	Jagmohan_Sharma	JMS123@gmail.com	4567894261	IIITM_Campus,IIITM_Gwalior	Lecturer	Teaches_Compiler_Design
DB11	Satish_Kumar	diamondGamer@gmail.com	9586758542	IIITM_Campus,IIITM_Gwalior	Associate_Professor	Teaches_DBMS

Enter 'y' to continue or Enter 'n' to exit the program.

n

vivekup3424@vivekup3424-Inspiron-15-3567: /media/vivekup3424/New Volume/IIITM Gwalior/Sem 3/oops/OOPS-Project\$

Output:-

```
vivekup3424@vivekup3424-Inspiron-15-3567: /media/vivekup3424/New Volume/IIITM
s/00PS-Project$ ./Source
University Management System
Click the options to do desired results:
1.Add a new student in the university
2.Show the details of all students
3.Show the Academic Record of all students
4.Show the Courses opted by a particular student
5.Add a new faculty in the university
6.Show the details of all faculties in university
7.Show the details of accounts of all faculties
8.Add a new employee in the university
9.Show the details of all employees in university
10.Show the details of accounts of a particular employee
12.Show all the department in the university
13.Add a new classroom in the university
14.Add a new student in a classroom
15.Add a new faculty in a classroom
16.Show all the classrooms in the university
17.Enter to exit program.
-----
13
-----CLASSROOMS-----
Enter the number of classes in university: 1
For classroom 1 enter the id of classroom: 6006
Enter the number of students in classroom: 5
Enter the id of student inside classroom:
ABC123 ABC122 ABC124 BCS111 BCS100
Enter the number of teachers in classroom: 2
Enter the id of teacher inside classroom:
CD11 DB11
Enter 'y' to continue or Enter 'n' to exit the program.
y
```

Output:-

```
Enter 'y' to continue or Enter 'n' to exit the program.
y
University Management System
Click the options to do desired results:
1.Add a new student in the university
2.Show the details of all students
3.Show the Academic Record of all students
4.Show the Courses opted by a particular student
5.Add a new faculty in the university
6.Show the details of all faculties in university
7.Show the details of accounts of all faculties
8.Add a new employee in the university
9.Show the details of all employees in university
10.Show the details of accounts of a particular employee
12.Show all the department in the university
13.Add a new classroom in the university
14.Add a new student in a classroom
15.Add a new faculty in a classroom
16.Show all the classrooms in the university
17.Enter to exit program.
-----
16
For classroom with id: 6006
No of students: 5
ID of students in classroom are:
Students' IDs are:
ABC123 ABC122 ABC124 BCS111 BCS100
ID of teachers in classroom are:
Faculties' IDs are:
CD11 DB11
Enter 'y' to continue or Enter 'n' to exit the program.
y
University Management System
Click the options to do desired results:
1.Add a new student in the university
2.Show the details of all students
3.Show the Academic Record of all students
4.Show the Courses opted by a particular student
5.Add a new faculty in the university
6.Show the details of all faculties in university
7.Show the details of accounts of all faculties
8.Add a new employee in the university
9.Show the details of all employees in university
10.Show the details of accounts of a particular employee
12.Show all the department in the university
13.Add a new classroom in the university
14.Add a new student in a classroom
15.Add a new faculty in a classroom
16.Show all the classrooms in the university
17.Enter to exit program.
```


Output:-

```
Enter the ID of classroom: 6006
Enter the ID of student to be added in classroom: CFG156
Enter 'y' to continue or Enter 'n' to exit the program.
```

```
y
University Management System
Click the options to do desired results:
1.Add a new student in the university
2.Show the details of all students
3.Show the Academic Record of all students
4.Show the Courses opted by a particular student
5.Add a new faculty in the university
6.Show the details of all faculties in university
7.Show the details of accounts of all faculties
8.Add a new employee in the university
9.Show the details of all employees in university
10.Show the details of accounts of a particular employee
12.Show all the department in the university
13.Add a new classroom in the university
14.Add a new student in a classroom
15.Add a new faculty in a classroom
16.Show all the classrooms in the university
17.Enter to exit program.
```

```
-----
16
For classroom with id: 6006
No of students: 6
ID of students in classroom are:
Students' IDs are:
ABC123 ABC122 ABC124 BCS111 BCS100 CFG156
ID of teachers in classroom are:
Faculties' IDs are:
CD11 DB11
Enter 'y' to continue or Enter 'n' to exit the program.
```

```
n
vivekup3424@vivekup3424-Inspiron-15-3567:/media/vivekup3424/New Volume/IIITM
```