Assignment #1

Course Registration & Student Management Program

KAIST

CS360

Rules

- **Due**
  - 2023. 4. 25. (~23:59) (Do not accept late submission)

- **Evaluation**
  - Each question contributes equally to the score (20% per each)

- **Submission standard**
  - You should submit a *[hw1_student ID].zip* file that contains a *[hw1_student ID].py* file.
  - Your *[hw1_student ID].py* file should generate a *[output_studentID].*txt file.

    (e.g., if your studentID is 20230001, submit a hw1_20230001.zip that contains a hw1_20230001.py file. The python file writes its answer on output_20230001.txt file.)

Rules

- **Ask for ID and PW then connect DB if they are valid**
  - Let your ID and Password as inputs
  - If you fix a ID and corresponding PW for your connection, 20% will be deducted.
- **Ask a command and perform a corresponding task**
  - You don’t have to ask commands repeatedly.
- **Skeleton Codes will be given.**
  - You don’t have to use it.
  - But, submit only 1 python file.
- **Follow the form of inputs and outputs**
  - Because we grade by program, there may be a penalty for not following the format.

Database for Assignment 1

- Design of Database

STUDENT	studentID	Name	deptName	CGPA	MentorID
	20180001	Kim, Chul Soo	CS	3.73	20180001
	20180002	Lee, Young Ja	EE	2.89	20180002
	20190002	Jang, Ji Youn	BIS	3.92	20180001
	...				

COURSE	courseID	title	deptName	credits
	CS101	Introduction to Programming	CS	3
	CS230	System Programming	CS	3
	...			

INSTRUCTOR	instructor ID	name	deptName
	1001	Jang, Young Min	HSS
	3001	Park, Taesu	CS
	...		

TAKES	studentID	courseID	semester
	20220001	HSS090	Fall
	20220002	HSS090	Spring
	...		

TEACHES	instructorID	courseID	semester
	3002	CS101	Spring
	3003	CS230	Spring
	...		

- Semesters : The semester that course opens
- MentorID : StudentID of his/her mentor (All MentorIDs are in the student table)
  (If a student is a head mentor and has no mentor, MentorID = StudentID)

Purpose

- **Course Registration Program**
  1. Register a course
  2. Drop a course

- **Student Management Program**
  1. Registered credits averages of N students
  2. CGPA rank within department
  3. Find a head mentor

Assignment #1

- Q1. Register a course
  - If command is 1, ask **a studentID**, **a semester**, and **a courseID** in a line.
  - If the inputs are valid,
    1. Print “Register Completed”
    2. Add the information into **TAKES** table.
    3. Show the sum of credits that the student registered in the input semester.
  - If the inputs are invalid,
    1. Print “Register Denied”
    2. Show the sum of credits that the student registered in the input semester. (Consider the sum of credit = 0)

  - ❖ These are invalid cases you have to consider. (Other cases will not be given)
    I. The input student already register the input course in this year.
    II. The input course is not open in the input semester.
    III. If a student tries to take more than 24 credits in the spring/fall semester or more than 3 credits in the summer/winter semester.

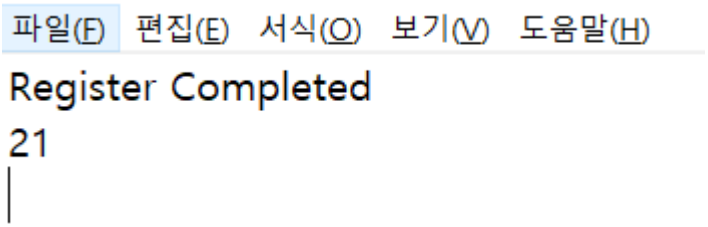
Assignment #1

- Example for Q1

Input

```
What do you want to do?
1. Register a course
2. Drop a course
3. Registered credits averages of N students
4. CGPA rank in department
5. Find a headmentor
1
Input?
20220001 Spring CS360
```

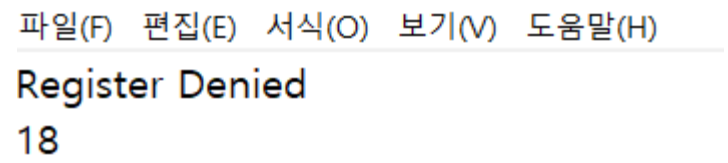
Output



Input

```
What do you want to do?
1. Register a course
2. Drop a course
3. Registered credits averages of N students
4. CGPA rank in department
5. Find a headmentor
1
Input?
20220001 Fall CS575
```

Output



Assignment #1

- Q2. Drop a course
  - If command is 2, ask **a studentID**, **a semester**, and **a courseID** in a line.
  - If the inputs are valid,
    1. Print “Drop Completed”
    2. Remove the information from **TAKES** table.
    3. Show the sum of credits that the student registered in the input semester. (Consider the sum of credit = 0)
  - If the inputs are invalid,
    1. Print “Drop Denied”
    2. Show the sum of credits that the student registered in the input semester.

❖ These are invalid cases you have to consider. (Other cases will not be given)

I. The input course is not open in the input semester.

II. The student did not register the input course in the input semester.

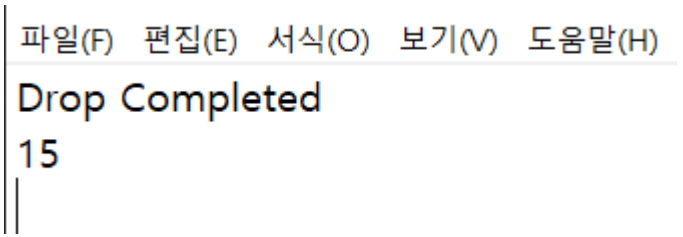
Assignment #1

- Example for Q2

Input

```
What do you want to do?
1. Register a course
2. Drop a course
3. Registered credits averages of N students
4. CGPA rank in department
5. Find a headmentor
2
Input?
20220001 Spring CS360
```

Output



Input

```
What do you want to do?
1. Register a course
2. Drop a course
3. Registered credits averages of N students
4. CGPA rank in department
5. Find a headmentor
2
Input?
20220001 FALL CS575
```

Output

Assignment #1

- Q3. Registered credits averages of N students.
  - If command is 3, ask a **studentID** and **a number N**.
  - Compute the registered credits averages (in this year) of N students following two conditions:
    (i) Their studentIDs are equal to or greater than an input studentID.
    (ii) They are the N students with the smallest studentID among the students who satisfy the condition (i).
  - Show **the computed registered credits average of N students.**

ex) Input : 20180005 3

StudentID	RegisterCredits
20180001	48
20180005	51
20190007	48
20190009	24
20200010	27
20200034	42

Cond 1

Cond 2

registered credits average
=(51+48+24)/3 = 41.0

- Please notice following rules
  I. Don't have to consider invalid inputs. (e.g., 20220001 -3)
  II. There is no case that the number of students who satisfy condition (i) is less than N.

Assignment #1

- Example for Q3

Input

```
What do you want to do?
1. Register a course
2. Drop a course
3. Registered credit averages of N students
4. CGPA rank within department
5. Find a headmentor
3
Input?
20180005 3
```

Output

Assignment #1

- Q4. CGPA rank within department
  - If command is 4, ask a **studentID**.
  - Show the CGPA rank of the student in his/her department.

	deptName	**CGPA**	**CGPA Rank in CS**
20171201	CS	4.21	1
20191730	CS	4.18	2

- Please notice following rules
  I. Don’t have to consider invalid inputs. (e.g., 20c130001)

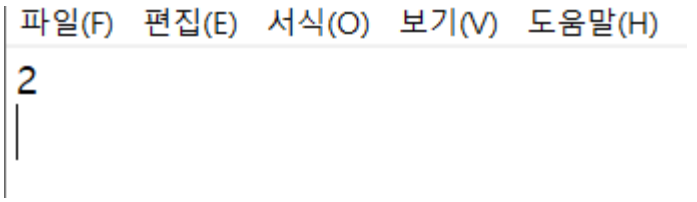
Assignment #1

- Example for Q4

Input

```
What do you want to do?
1. Register a course
2. Drop a course
3. Registered credits averages of N students
4. CGPA rank in department
5. Find a headmentor
4
20191730
```

Output



Assignment #1

- Q5. Find a head mentor (*Use recursive query)
  - Each a junior student in this university has own senior mentor.
  - To find a head mentor, you have to follow mentors until there is a mentor whose mentor is himself/herself.
    (ex. 20220001 (mentee) -> 20210003 -> 20200001 -> 20180003 (Head mentor))
  - If command is 5, ask a **studentID**
  - Show **studentID of his/her head mentor.**

studentID	mentorID
20180003	20180003
20200001	20180003
20210003	20200001
20220001	20210003

- Please notice following rules
  I. For each student, the student id of his/her mentor is shown in MentorID column.
  II. The studentID of a mentor is always smaller than the studentID of mentee.
  III. If a student is a head mentor, his/her head mentor is himself/herself.

Assignment #1

- Example for Q5

Input

```
What do you want to do?
1. Register a course
2. Drop a course
3. Registered credits averages of N students
4. CGPA rank in department
5. Find a headmentor
5
20220001
```

Output