Assignment 4

You are given the roll numbers and list of courses for *n* students. Also you are given the roll numbers of *t* students. Print their CGPA (till 1st place of decimal). Note that you must minimally implement a batch class that stores an array of students, a student class and a course class.

Input Format
The first line is *n*, the number of students. For each student, the first line of input is roll number and then the number of courses for that student, *m*. Thereafter there are multiple lines, mentioning the course code and grade of the student in the course, each on separate lines.

The roll number is of the form ABC201NXYZ, where ABC is either IIT, LIT, ITM, BIM, ICM, ISM, IIM, IHM, IRM or IWM. N is either 6, 5, 4 or 3. XYZ is a number between 000 and 199. If a roll number is wrongly entered at this stage, the message "Incorrect Roll Number" is printed and the user needs to re-enter, till entered correctly.

The course code is of the form DXYZABCT, where D is I, E, S or M. XYZ are all capital alphabets. A is a digit from 1 to 9. B is a digit from 0 to 3. C is a digit from 0 to 3. T is either C or E. If a course code is incorrect, the message "Wrong Course Code" is printed and the user needs to re-enter till entered correctly. The course credits are B+C. Unlike the current system, it is assumed that the lab and theory have the same grades.

The grade can be A+, A, B+, B, C, D, E, F and I. Only the first 6 grades are pass grades. If a grade is wrongly entered, the message "Illegal Grade" is printed and the user needs to re-enter, till entered correctly.

For *n* students enter the roll number (format & list given), *n* courses (list and format), grades (A to D only), credits (2 to 5 only), calculate CGPA. All retry.

The next input is *t*, the number of queries, followed by t lines, each mentioning the roll number. If the roll number exists, the CGPA is printed on the screen, else the message "Roll Number not found" is printed on the screen.

All error messages must be handled as user defined exceptions. Make separate user defined exceptions for all types. All exceptions must be triggered at the constructors/setters of the most suitable class and not when taking the inputs.

Sample Input
3
IIZ2016001
IIT2019001
IIT2016876
IT2016001
IIT2016001
3
IOOM392C

IOOM332
IOOM332C
G
A
MAT330C
SMAT330C
D
ITOC330C
Z+
B+
LIT2015001
3
ITOC330C
C
IOPS339C
IOPS332C
A+
EMIP332C
D+
D
IQM2016001
RM2016001
IRM201601
IRM2016001
2
IOOM332C
A+
DMIP332C
EMIP332C
A
6
IRM2016001
IIT2016002
LIT2015001
IT2016001
IIT2016001
LIT2015501

Sample Output

9.5
Roll Number not found
7.1
Roll Number not found
7.6
Roll Number not found

Explanation
Incorrect Roll Number (IIZ2016001)
Incorrect Roll Number (IIT2019001)
Incorrect Roll Number (IIT2016876)
Incorrect Roll Number (IT2016001)
Wrong Course Code (IOOM392C)
Wrong Course Code (IOOM332)
Illegal Grade (G)
Wrong Course Code (MAT330C)
Illegal Grade (Z)
Wrong Course Code (IOPS339C)
Illegal Grade (D+)
Incorrect Roll Number (IQM2016001)
Incorrect Roll Number (RM2016001)
Incorrect Roll Number (IRM201601)
Wrong Course Code (DMIP332C)
Roll Number not found (IIT2016002)
Roll Number not found (IT2016001)
Roll Number not found (LIT2015501)

S. No.	Roll No.	Course ID	Course Credits	Grade	CGPA
1.	IIT2016001	IOOM332C	5	A (9)	(9*5+5*3+8*3)/11=7.6
		SMAT330C	3	D (5)	
		ITOC330C	3	B+ (8)	
2.	LIT2015001	ITOC330C	3	C (6)	(6*3+10*5+5*5)/13=7.1
		IOPS332C	5	A+ (10)	
		EMIP332C	5	D (5)	
3.	IRM2016001	IOOM332C	5	A+ (10)	(10*5+9*5)/10=9.5
		EMIP332C	5	A (9)	

Assignment 5

1) Consider question 1 of assignment 2 (The Convocation). Make a GUI to take input, keeping the data model the same as before. After all inputs are taken, display the details of all students using a suitable GUI. The display GUI should have a left and right button to iterate through students, a search bar to find details of a desired student, a modify button to correct any detail, an add button to add more data, and a delete button to delete a record. Illegal inputs that do not match the format should come as popups.

2) Consider a drawing app wherein a user fixes a color and a size. On clicking a square of the fixed size and color is drawn on the screen. After clicking the last drawn square can be moved on the screen using the arrow keys. Please ensure that the data and GUI is as separate as possible in separate classes. You must first make a good class diagram and then implement the question.