MA104 Assignment

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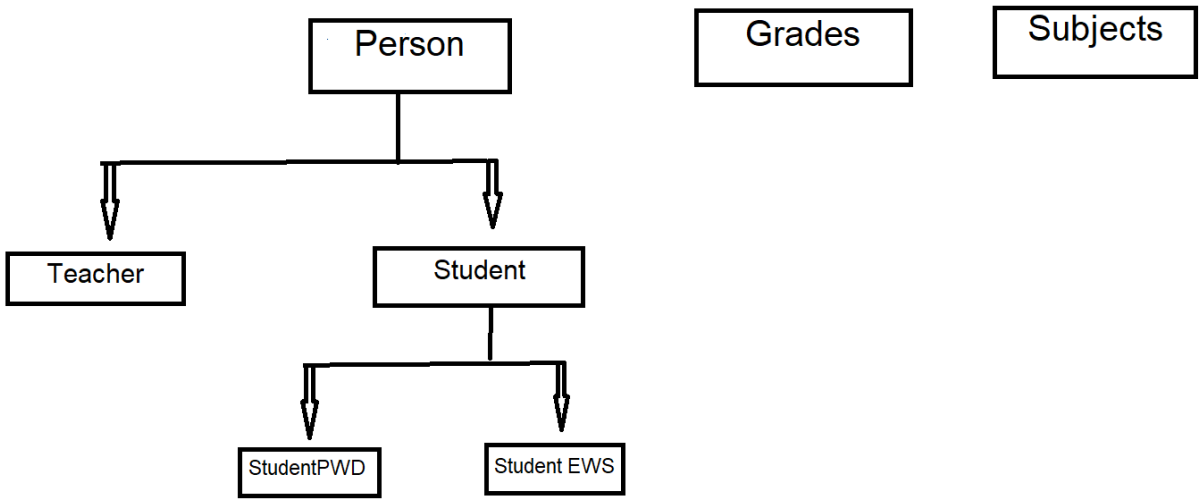
Problem Statement:

Making a Academic program in Java that can be used as a category wise report card generator for an institution.

Classes Linkage Diagram:



Functions of Classes:

Class person:

- Super class to Student and Teacher.
- Class has variables Name and Age.

Class Teacher:

- Subclass to Person.
- Has method *subjgrade_decider* which returns PASS or FAIL for a student based on the category and the grade he got in the subject
- Has method *set_subj* which sets the grade for the respective subjects of a student.
- Has a method *get_repo* which prints the complete report card for a student.

Class Student:

- Subclass to Person.
- *Category* ,*cutoff* and *CPI* as variables

- Has *subj1, subj2, subj3, subj4* as 4 subject variables
- Has a constructor that by default assigns the category of the student to GENERAL and the cutoff of grade pointer to be 9 for each subject.
- Has methods of **setters and getters** for category, cutoff and CPI each
- Also has a method to calculate CPI.

Class StudentPWD/StudentEWS:

- These classes are subclasses of Student class.
- They have a constructor that sets the category and cutoff to their respective values for these classes using **Method Overriding**.

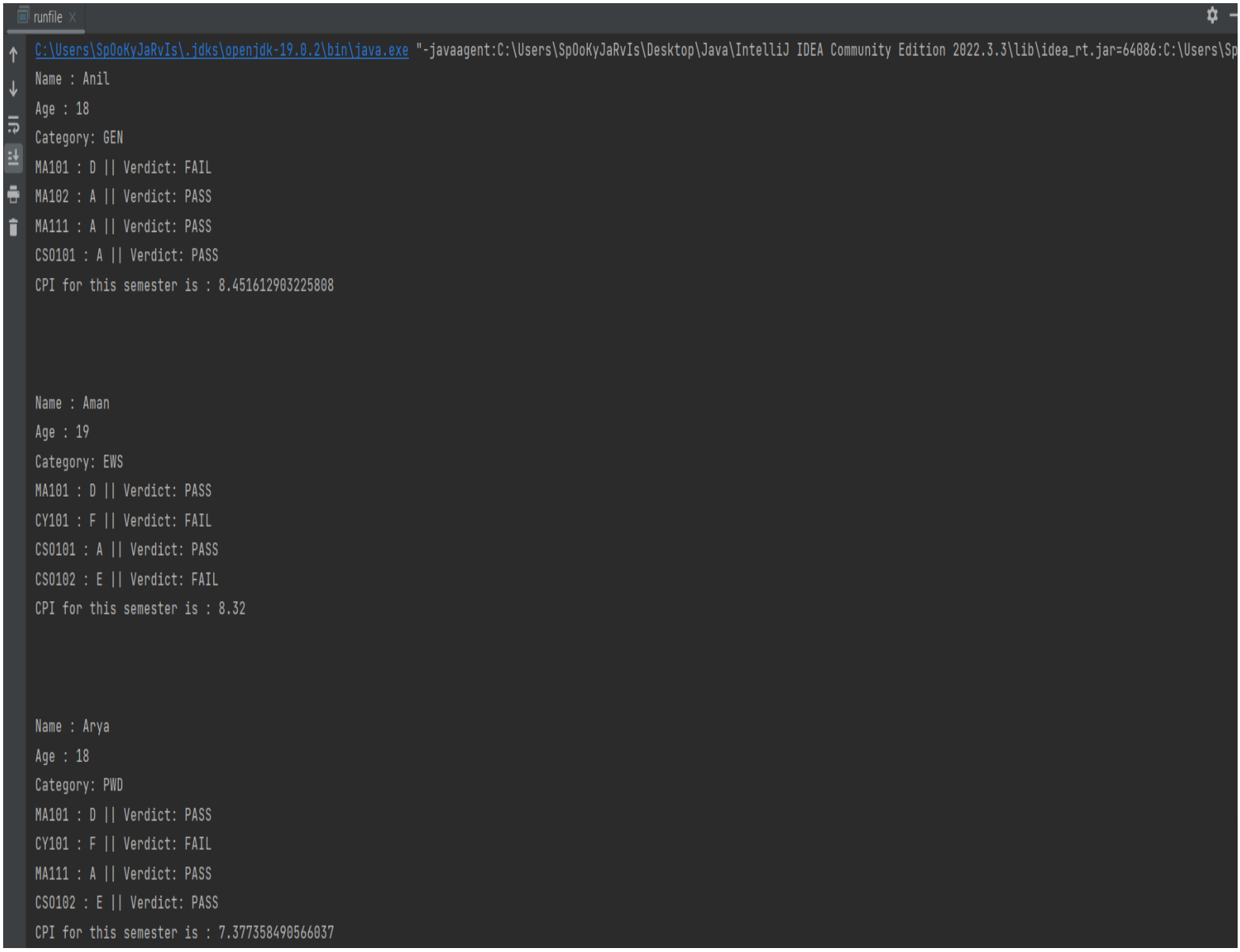
Class Grades:

- This class has two variables associated with it, the *grade_name* and *pointer* which denotes the grade pointer.
- The speciality of this class is that the access modifier of the pointer variable is **private** and only has a **getter** method. Hence once the gradepointer of a grade is set using the modified constructor it cannot be changed again as it's **read only**.

Class Subject:

- Subject has 3 variables namely *Subj_name, subj_grade* and *credits*.
- Using the modified constructor the name and credits of the subject is set with the subj_grade being A by default.
- It has a **getter** method only for *credit*. Since the *credit* variable is private it makes the *credit* **read only** for a subject once set.
- The default grade for the subject is changed when the teacher assigns the students the grade for their respective subjects.

runfile.java Explained:

- First of all the name and the age of the teacher is set which is accessing the program to make a report card.
- Then the grades are initialized with the modified constructor taking the grade name and grade pointer as arguments.
- Since the grade pointer variable is kept private and only has a getter the code of changing the pointer once set won't work even if uncommented.
- Then the subjects and the credits of each subject are initialized.
- Note that the initialization of grades and subjects are not the inputs. It's the data that is supposed to be prefixed by the educational institution.
- Also the credits of the subjects cannot be changed once set for the same reason as grade pointers.
- Then the input of Student details such as name name, age and category is taken in the system.
- Then the teacher assigns the Grade to the students for each of the concerned subjects using *set_subj* method.This method is available only for teacher and not for the student.
- And finally the teacher can print the report card on the screen using the *get_repo* method.
- At the end there is a demonstration of the *subjgrade_decider* method of teachers by which we can print whether a student is FAIL or PASS in a certain course.

Output of runfile.java: