UNIVERSITY OF TECHNOLOGY JAMAICA

Academic Probation Alert Python and Prolog Project

Group Size: 3-4

Given: October 2023 **Due: Week of November 27, 2023**

The University of Technology is desirous of having a program created using Python and Prolog that will facilitate the generation of reports/alerts that provide information regarding students who are close to having a GPA of 2.0. A current undergraduate student who has a cumulative GPA of below 2.0 at the end of an academic year will be placed on Academic Probation.

The GRADE POINT AVERAGE (GPA) is a quantitative measure of a student's performance. It is the average obtained by dividing the sum of the product of grade point and credit for each module by the total number of credits attempted. The GPA is calculated as outlined below.

CALCULATION OF GPA

The examples below indicate calculations for modules taken including one failed, as well as an example complete with redos. Please note that failed modules will also form part of the calculated GPA.

Table 1 shows that for Semester 1, the product of grade point and credit is 53.55. This is divided by 20 (the number of credits taken). The GPA is 2.67

Table 1: Calculated GPA for Semester 1

Module	S	T	V	W	X	Y	Z	Total
Credits	**3**	**3**	**4**	**4**	**3**	**2**	**1**	**20**
Grade	A-	C	B+	C+	D	B	A	
Grade Points	3.67	2.00	3.33	2.33	1.30	3.0	4.00	
Grade Points earned	11.01	6.00	13.32	9.32	3.9	6.0	4.00	53.55
GPA = 53.55/20 = **2.67**								

Table 2 shows the modules completed in Semester 2, including the redone module X. The GPA for this semester is 49 divided by 14 = 3.50, and the cumulative GPA for both semesters is (53.64+49) divided by (20+14) = 102.64/34 = 3.02

Table 2: Calculated GPA for Semester 2, including redone Module X.

Module	L	P	X (Redo)	Q	R	Total
Credits	1	4	3	4	2	14
Grade	A+	A-	B	B+	A	
Grade Points	4.30	3.67	3.0	3.33	4.00	
Grade Points earned	4.30	14.67	9.00	13.32	8.00	49.29

GPA = 49.29/14 = **3.52**

Details of Database for the program

The program will interface with a database that will include the tables below. The database may include any other table necessary.

Table: Student Master

Field
Student ID
Student Name
Student Email
School
Programme

Table: Module Master

Field
Module
Number of Credits

Table: Module Details

Field
Module
Year
Semester
Student ID
Grade Points

The program will operate as follows:

The program will allow report generation as outlined below.

The user will then select a desired year, optionally a desired GPA, then click a button to proceed.

The program will then do the following:

Read the records of the module detail table and do the following for each distinct Student ID:

Ascertain the total credit for the modules taken by the student for each semester.
Multiply the student's ***Grade point*** for each module by the corresponding ***credit*** for the module to arrive at the *Grade Points Earned* for each module.

Calculate the total of the *Grade Points Earned* by the student for each semester then divide the ***Total Grade Points*** by the modules' ***Total Credit*** (for the semester in question) to arrive at the student's GPA for the semester.

If semester 2 data is available, the Cumulative GPA for the student is calculated by dividing the sum of the ***Total Grade Points*** for both semesters by the sum of the ***Total Credit*** for both semesters. If only semester one data is available, the Cumulative GPA is assigned the student's GPA for semester 1.

Note: The python program should make calls to prolog to carry out all mathematical calculations.

The program will then produce a softcopy report with the following GPA data for students with Cumulative GPA's less than or equal to the GPA entered by the user.

University of Technology
Academic Probation Alert GPA Report
Year:
GPA:

Student ID	Student Name	GPA Semester 1	GPA Semester 2	Cumulative GPA

If no GPA was recorded by the user a default GPA is used as the upper limit for the report.

The option should be provided to update the default GPA of 2.2 to be used by the system. This default GPA should be stored in the prolog knowledge base.

Alert Requirements

The program should also check the system periodically and send an alert about students whose GPA is below or equal to the default GPA. The alert should be sent to the student, their advisor, the programme director and the faculty administrator. The alert should include the programme that the student is enrolled in, and the school the student attends. The following link contains information regarding the sending of e-mails in python. https://mailtrap.io/blog/python-send-email/

There will be a demonstration of the system which is scheduled for the Week of November 27, 2023.

Required:

Students should work in groups of no more than four (4). The group should present the completed program along with commented code and project documentation.

You are required to submit the complete source code, and documentation. The documentation should include the following: System Design, User Manual and Project Group Report (highlighting the contribution of each member and lessons learnt) by December 1, 2023.

Marking Scheme:
Marks will be awarded as follows:
- Facts (10%)
- Rules (15%)
- Persistence (10%)
- Functionality (30%)

o Proper use facts and rules [5%]

o Proper use of prolog search mechanisms [5%]

o Storing of User Response [5%]

o Use of User Response in arriving at conclusion / solution [5%]

o Robustness [5%]

o Correctness [5%]

- Documentation (15%)

o Internal : comments, indentation and naming conventions

o External: hardcopy – formatting, neatness, sample run, group report and declaration of authorship (one per member)

- User Interface & Ease of Use (10%)

- Originality & Ingenuity (10%)

There will be an additional 10% for groups who provide a graphical user interface (GUI) for this system.

Marks will be subtracted for late assignments at a rate of 7.5% per day. Assignments more than one week late will not be accepted.