Question1 (BMI – BODY MASS INDEX) - Programming Fundamentals

The **body mass index** (**BMI**) is a measure of relative weight based on an individual's mass and height.

$$\mathrm{BMI} = \frac{\mathrm{mass(kg)}}{(\mathrm{height(m)})^2}$$

Body mass index', a well known measure of adiposity, ranges from underweight to obesity and is commonly employed among children and adults to understand health outcomes.

Following are the details listed for three countries as per their respective BMI values and health risks:

India

BMI Range(kg/m2)	Health Risk
<18.5	Low
18.5 - 22.9	Moderate
23.0 and above	High

Japan

BMI Range(kg/m2)	Health Risk
<18.5	Low
from 18.5 to 24.9	Moderate
25.0 and above	High

Singapore

BMI Range(kg/m2)	Health Risk
22.9 and below	Low
23.0 to 27.4	Moderate
27.5 and above	High

1. Write a console program which accepts person id, mass in **kg**, height in **feet** and country name.
2. Find the person's health risk type as per "low", "moderate" and "high" according to the table given above.
   For e.g. if a person id = 1001, height=5.1 ft and mass=55.5 kg and country is INDIA

   Assumptions:
   - **1ft=0.3 meter and**
   - **height is to be rounded up to 0 decimal place hence 5.1ft=5.1*0.3m=1.53m will be rounded to 2m.**

   So the BMI = (55.5 kg) / (5.1ft)*(5.1ft)
   = (55.5 kg) / (2m)*(2m)
   = 13.9 kg/m2

Hence the result should be as below:

Id : 1001
Mass : 55.5kg
Height : 5.1ft
Country : INDIA
BMI : 13.9
Health Risk : Low

Question2 (CIBIL Credit Score) - Programming Fundamentals

While sanctioning the personal loan requested by its customers, bank sees the CIBIL credit score of the customer which he has earned in the past years of transactions. Here's a table to give you an idea of percentage of the loan sanctioned to customers with different credit scores (based on assumptions):

CIBIL Credit score	Amount of loan eligible
<650	47000
>=650	576000

It is assumed that the above sanctioned % gets more affected depending upon the customer reputation towards the bank as below:

Reputation	Decrease in percentage of loans sanctioned
Good	0%
Bad	10% of eligible loan amount

What to implement:

Write a function which accepts CIBIL score, the amount of loan requested, reputation of the customer and years of account opened, and returns the amount of loan sanctioned depending upon the CIBIL score and reputation of the customer towards the bank payments.

Input

CIBIL score as integer, Loan requested amount as integer and reputation as string either "**Good**" or "**Bad**"

Output

Amount of loan sanctioned as double

Test Case	Input	Output
UTC01_01	**(500,"Good")**	47000
UTC01_02	**(500,"Bad")**	42,300
UTC01_03	**(700,"Good")**	5,76,000
UTC01_04	**(700,"Bad")**	5,18,400

Explanations:

For UTC01_01:- cibil score is 500 which is <650 so the amount sanctioned is **47000**. Since reputation is good so no further deductions.

For UTC01_02:- cibil score is 500 which is <650 so the amount eligible is **47000**. Since reputation is bad so further 10% deductions means **47000-0.1*47000=42,300**.

For UTC01_03:- cibil score is 700 which is >650 so the amount eligible is **5,76,000**. Since reputation is good so no further deductions.

For UTC01_04:- cibil score is 700 which is >650 so the amount eligible is **5,76,000**. Since reputation is bad so further 10% deductions means **5,76,000-0.1*5,76,000=5,18,400**.

Question3 (Calculation of Club Members Fees) - Object Oriented Programming

A Golf club has 3 categories of memberships: **Regular**, **Gold** and **Silver**. Members can utilize the club's services as per their category. Club personal wants to calculate the charges based on the number of months the services have been utilized by its member.

Objective

Working with classes and inheritance

Problem Statement

The Golf Club charges its regular-members on monthly basis for using the services as below:

1) No Membership fee
2) No Enrollment fee
3) Golf services Rs 20,000 per month

However if any member wants to enroll as a Gold or Silver member, then charges are as below:

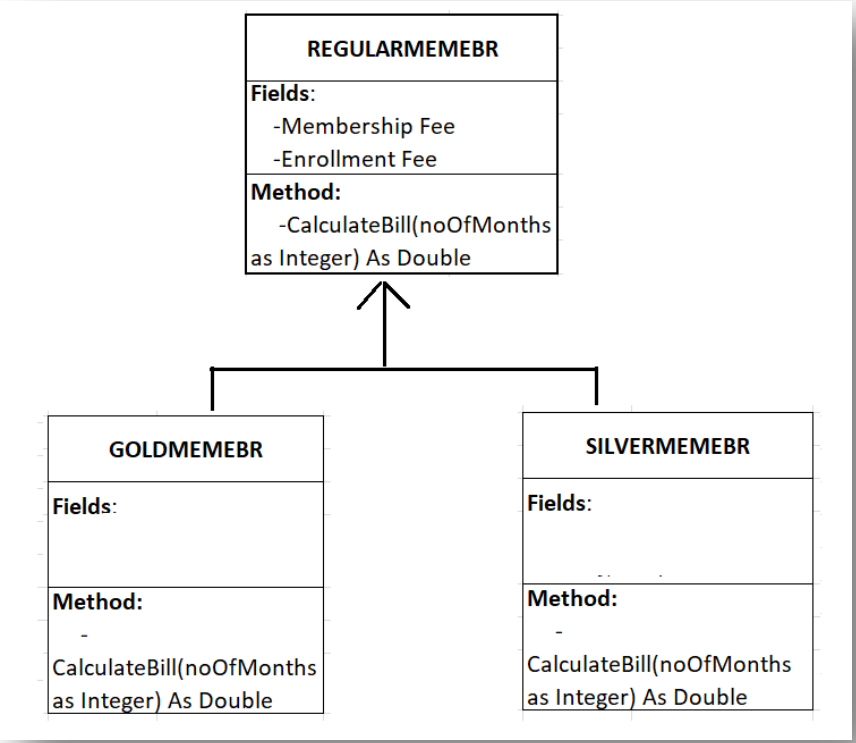
A. Gold Members:

1) Membership fee---->90,000
2) Enrollment fee---> 10,000
3) Free Golf service for 6 months, then after Rs 10,000 per month

B. Silver Members:

1) Membership fee---->15,000
2) Enrollment fee---> 5000
3) Free Golf service for 6 months, then after Rs 20,000 per month

Define the classes for all the member types with following details:



Fields:

- Enrollment fee
- Membership fee

Method:

1. **double CalculateBill(int noOfmonths)**

Tasks to be completed:

1. Define the two classes **RegularMember, GoldMember** and **SilverMember** and make use of proper inheritance and access specifiers.

2. Define and implement the class methods logics.

3. Display the amount of bill based on choice of membership and number of months of services used.

Following also should be adhered in the program:

Coding Standards
Use of proper naming conventions for the variables, methods, parameters and classes
Use of proper data-types
Use of modularity
Use of Dynamic Polymorphism
Use of proper access specifiers of different members of classes
Overall completeness