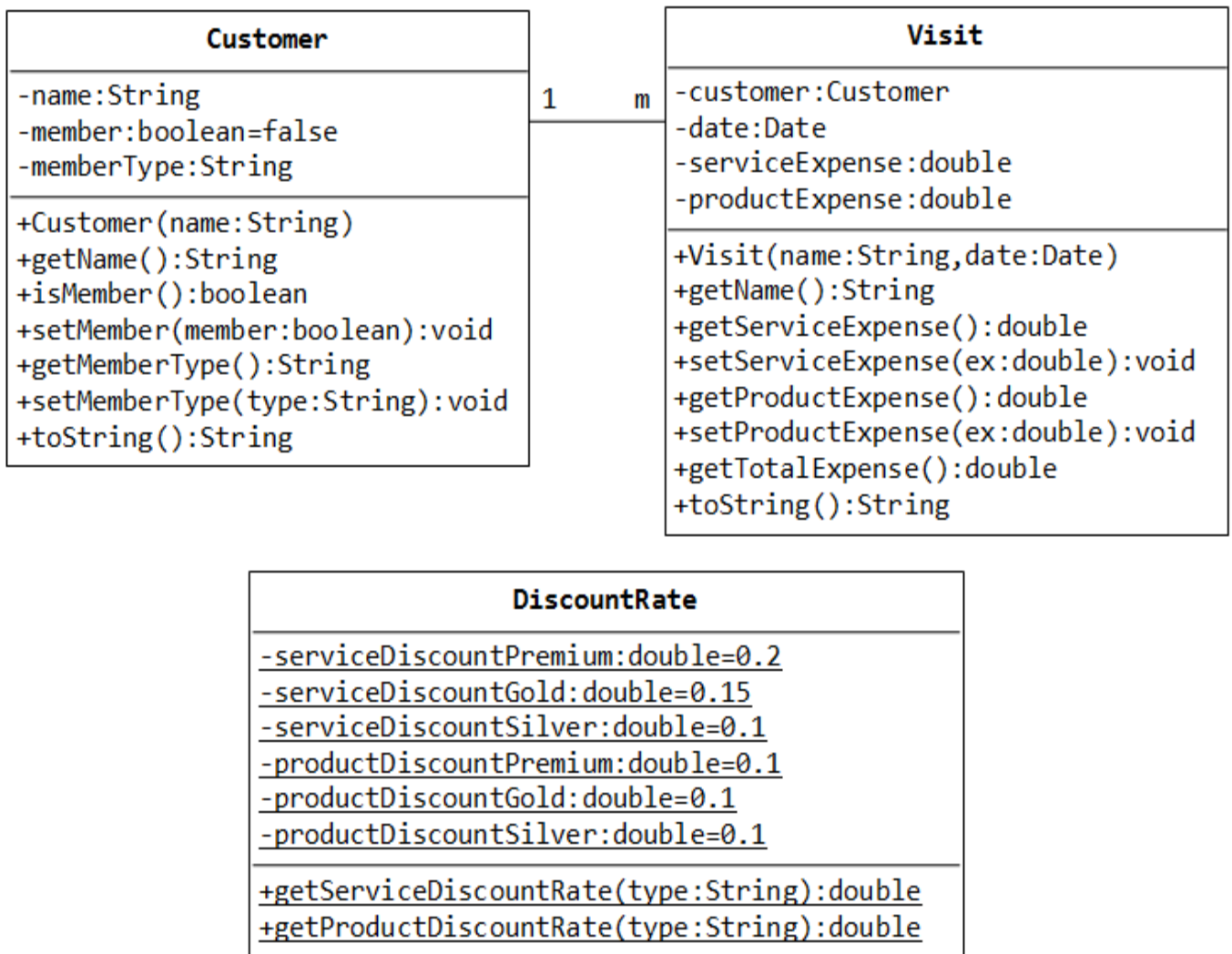Task – 1:

You are asked to write a discount system for a beauty salon, which provides services and sells beauty products. It offers 3 types of memberships: Premium, Gold and Silver. Premium, gold and silver members receive a discount of 20%, 15%, and 10%, respectively, for all services provided. Customers without membership receive no discount. All members receives a flat 10% discount on products purchased (this might change in future). Your system shall consist of three classes: Customer, Discount and Visit, as shown in the class diagram. It shall compute the total bill if a customer purchases $x of products and $y of services, for a visit. Also write a test program to exercise all the classes.

Customer				Visit
-name:String	1	m		-customer:Customer
-member:boolean=false				-date:Date
-memberType:String				-serviceExpense:double
				-productExpense:double
+Customer(name:String)				+Visit(name:String,date:Date)
+getName():String				+getName():String
+isMember():boolean				+getServiceExpense():double
+setMember(member:boolean):void				+setServiceExpense(ex:double):void
+getMemberType():String				+getProductExpense():double
+setMemberType(type:String):void				+setProductExpense(ex:double):void
+toString():String				+getTotalExpense():double
				+toString():String

DiscountRate

-serviceDiscountPremium:double=0.2
-serviceDiscountGold:double=0.15
-serviceDiscountSilver:double=0.1
-productDiscountPremium:double=0.1
-productDiscountGold:double=0.1
-productDiscountSilver:double=0.1

+getServiceDiscountRate(type:String):double
+getProductDiscountRate(type:String):double

The class DiscountRate contains only static variables and methods (underlined in the class diagram).

Task – 2

The classic Eight Queens puzzle is to place eight queens on a chessboard such that no two queens can attack each other (i.e., no two queens are on the same row, same column, or same diagonal). There are many possible solutions. Write a program that displays one such solution. A sample output is shown below:

```
|Q| | | | | | | |
| | | | |Q| | | |
| | | | | | | |Q|
| | | | | |Q| | |
| | |Q| | | | | |
| | | | | | |Q| |
| |Q| | | | | | |
| | | |Q| | | | |
```

For more information on the game follow the link
https://en.wikipedia.org/wiki/Eight_queens_puzzle