COMP122 - Assignment 1 Part 2

Analysis and requirements:

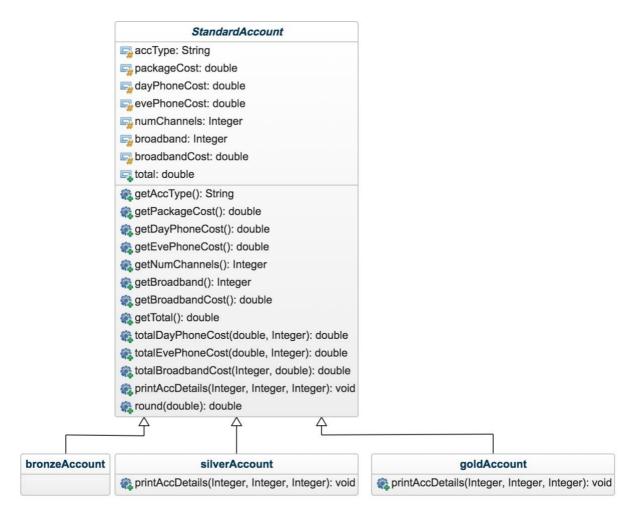
Write a program that displays a company's package that provides combined broadband, TV, and mobile phone packages to a potential customer. The company has three different accounts: bronze, silver and gold. The program should display the cost per month for each account type as well as: daytime phone costs (per minute), evening/weekend phone costs (per minute), number of TV Channels, broadband (included per month), broadband cost (per GB above included amount) as well as any bonuses provided by an account. This is also demonstrated in the image below.

	Bronze	Silver	Gold
Package Costs (monthly)	£35.00	£45.00	£60.00
Daytime phone costs (per minute)	12p	12p	0p
Evening/Weekend phone costs (per minute)	5p	0р	0p
Number of TV Channels	60	130	230
Broadband (included per month)	200GB	300GB	2000GB
Broadband (per GB above included amount)	20p	10p	10p

Before displaying the details of each account, the program should take as input from a potential client: the number of daytime phone minutes they use, the number of evening/weekend phone minutes they use and the amount of broadband usage, expressed in GB for a given month. The program should then display the costs and the total overall cost for each account after displaying its details. Based on the total overall cost for each account the program should then output the account that's the cheapest.

Design:

Class diagram:



My classes are structured in this way with the account types: bronze, silver and gold as subclasses of StandardAccount - the super class. This was done as I put most of the methods for calculations in the super class and the subclasses can all access them and override any if required – printAccDetails is overridden in SilverAccount and GoldAccount as they need to print some extra information.

Pseudocode:

Function that calculates the cost of broadband:

```
FUNCTION totalBroadbandCost(broadband, broadbandCost, broadbandUsage)

BEGIN

IF(broadbandUsage - broadband > 0)

(
total += (broadbandUsage - broadband) * broadbandCost

RETURN (broadbandUsage - broadband) * broadbandCost
```

```
)
       ELSE
        RETURN 0
        )
      END
Getting the number of daytime minutes used by the user – allowing no
negative number to be stored:
REPEAT
  PRINT "Please enter the number of daytime minutes used per month:"
 dayMins = getInput()
) UNTIL (dayMins < 0)
Getting the number of evening and weekend minutes used by the user –
allowing no negative number to be stored:
REPEAT
  PRINT "Please enter the number of nighttime minutes used per month:"
 eveningOrWeekendMins = getInput()
) UNTIL (eveningOrWeekendMins < 0)
Getting the number of Gigabytes used per month:
REPEAT
  PRINT "Please enter the number of Gigabytes used per month:"
 broadbandUsage = getInput()
) UNTIL (broadbandUsage < 0)
Working out which account has the cheapest overall total cost:
IF (bronzeTotal < silverTotal AND bronzeTotal < goldTotal)</pre>
 PRINT "Bronze account is cheapest cost"
ELSE IF ((silverTotal < bronzeTotal AND silverTotal < goldTotal) OR silverTotal ==
bronzeTotal)
PRINT "Silver account is cheapest cost"
```

```
ELSE IF ((goldTotal < bronzeTotal AND goldTotal < silverTotal) OR goldTotal == bronzeTotal
OR goldTotal == silverTotal)
(
    PRINT "Gold account is cheapest cost"
)</pre>
```

My approach here was to output the higher ranked account as the cheapest if 2 accounts have the same total cost and the same if 3 accounts have the same total cost.

Testing:

Important note: 'Display details' in the expected result column of the results table means the program should print out the details and costs (which are constant for each type of account). E.g

Bronze account: Display details

=

Account summary for Bronze account

Package cost: 35.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.05/min

Number of Channels: 60 Broadband Included: 200GB

Broadband Cost (above included limit): 0.2/GB

Silver account: Display details

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Account summary for Silver account

Package cost: 45.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 130 Broadband Included: 300GB

Broadband Cost (above included limit): 0.1/GB

Gold account: Display details

=

Account summary for Gold account

Package cost: 60.0

Cost of daytime calls: 0.0/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 230 Broadband Included: 2000GB

Broadband Cost (above included limit): 0.1/GB

Test data + Reason	Expected result	Actual result + Pass/Fail
Daytime mins: 100 Evening/weekend mins: 100 GB used: 325 Use the same test data as in the assignment brief.	Expected result Bronze account: Display details Total daytime calls cost: 12.0 Total evening calls cost: 5.0 Total (extra) broadband cost: 25.0 Total cost: 77.0 Silver account: Display details Total daytime calls cost: 12.0 Total evening calls cost: 0.0 Total (extra) broadband cost: 2.5 Total cost: 59.5 Spotify Account provided Gold account: Display details Total daytime calls cost: 0.0 Total evening calls cost: 0.0 Total evening calls cost: 0.0 Total ost: 60.0 Spotify Account provided Music On Demand provided Silver account is cheapest cost	Actual result + Pass/Fail Please enter the number of daytime minutes used per month: 100 Please enter the number of nighttime minutes used per month: 100 Please enter the number of Gigabytes used per month: 325 Account summary for Bronze account Package cost: 35.0 Cost of daytime calls: 0.12/min Cost of evening and weekend calls: 0.05/min Number of Channels: 60 Broadband Included: 200GB Broadband Cost (above included limit): 0.2/GB Total daytime calls cost: 5.0 Total (extra) broadband cost: 25.0 Total cost: 77.0 Account summary for Silver account Package cost: 45.0 Cost of daytime calls: 0.12/min Cost of evening and weekend calls: 0.0/min Number of Channels: 130 Broadband Included: 300GB Broadband Cost (above included limit): 0.1/GB Total daytime calls cost: 12.0 Total evening calls cost: 0.0 Total (extra) broadband cost: 2.5

Spotify Account provided

Account summary for Gold account

Package cost: 60.0

Cost of daytime calls: 0.0/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 230 Broadband Included: 2000GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 0.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided

Music On Demand provided

Silver account is cheapest cost

Pass

Daytime mins: 0

Evening/weekend mins: 0

GB used: 0

See if program behaves correctly if 0 is inputted for each input.

Bronze account:

Display details

Total daytime calls cost: 0.0
Total evening calls cost: 0.0
Total (extra) broadband cost: 0.0

Total cost: 35.0

Silver account: Display details

Total daytime calls cost: 0.0
Total evening calls cost: 0.0
Total (extra) broadband cost: 0.0

Total cost: 45.0

Spotify Account provided

Gold account: Display details

Total daytime calls cost: 0.0
Total evening calls cost: 0.0
Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided Music On Demand provided

Bronze account is cheapest cost

Please enter the number of daytime minutes used per

month: 0

Please enter the number of nighttime minutes used per

month: 0

Please enter the number of Gigabytes used per month: 0

Account summary for Bronze account

Package cost: 35.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.05/min

Number of Channels: 60 Broadband Included: 200GB

Broadband Cost (above included limit): 0.2/GB

Total daytime calls cost: 0.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 35.0

Account summary for Silver account

Package cost: 45.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 130 Broadband Included: 300GB

Broadband Cost (above included limit): 0.1/GB Total daytime calls cost: 0.0 Total evening calls cost: 0.0 Total (extra) broadband cost: 0.0 Total cost: 45.0 Spotify Account provided Account summary for Gold account Package cost: 60.0 Cost of daytime calls: 0.0/min Cost of evening and weekend calls: 0.0/min Number of Channels: 230 Broadband Included: 2000GB Broadband Cost (above included limit): 0.1/GB Total daytime calls cost: 0.0 Total evening calls cost: 0.0 Total (extra) broadband cost: 0.0 Total cost: 60.0 Spotify Account provided Music On Demand provided Bronze account is cheapest cost **Pass** Daytime mins: 200 Bronze account: Please enter the number of daytime minutes used per Evening/weekend mins: 150 Display details month: 200 GB used: 1900 Total daytime calls cost: 24.0 Please enter the number of nighttime minutes used per Total evening calls cost: 7.5 Use 'normal' day and Total (extra) broadband cost: 340.0 Please enter the number of Gigabytes used per month: evening minutes but large Total cost: 406.5 1900 broadband usage. Silver account: Account summary for Bronze account Display details Package cost: 35.0 Total daytime calls cost: 24.0 Total evening calls cost: 0.0 Cost of daytime calls: 0.12/min Total (extra) broadband cost: 160.0 Cost of evening and weekend calls: 0.05/min Total cost: 229.0 Number of Channels: 60 Spotify Account provided Broadband Included: 200GB Broadband Cost (above included limit): 0.2/GB Gold account: Total daytime calls cost: 24.0 Display details Total evening calls cost: 7.5 Total daytime calls cost: 0.0 Total (extra) broadband cost: 340.0 Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Spotify Account provided

Total cost: 60.0

Total cost: 406.5

Account summary for Silver account

Music On Demand provided Package cost: 45.0 Cost of daytime calls: 0.12/min Gold account is cheapest cost Cost of evening and weekend calls: 0.0/min Number of Channels: 130 Broadband Included: 300GB Broadband Cost (above included limit): 0.1/GB Total daytime calls cost: 24.0 Total evening calls cost: 0.0 Total (extra) broadband cost: 160.0 Total cost: 229.0 Spotify Account provided Account summary for Gold account Package cost: 60.0 Cost of daytime calls: 0.0/min Cost of evening and weekend calls: 0.0/min Number of Channels: 230 Broadband Included: 2000GB Broadband Cost (above included limit): 0.1/GB Total daytime calls cost: 0.0 Total evening calls cost: 0.0 Total (extra) broadband cost: 0.0 Total cost: 60.0 Spotify Account provided Music On Demand provided Gold account is cheapest cost Pass Daytime mins: 100 Bronze account: Please enter the number of daytime minutes used per Evening/weekend mins: 100 Display details month: 100 GB used: 330 Total daytime calls cost: 12.0 Please enter the number of nighttime minutes used per Total evening calls cost: 5.0 month: 100 Use data that results in the Total (extra) broadband cost: 26.0 Please enter the number of Gigabytes used per month: Total cost: 78.0 silver and gold accounts having the same total cost. Silver account: Account summary for Bronze account Display details Total daytime calls cost: 12.0 Package cost: 35.0 Total evening calls cost: 0.0 Cost of daytime calls: 0.12/min Total (extra) broadband cost: 3.0 Cost of evening and weekend calls: 0.05/min Total cost: 60.0 Number of Channels: 60 Spotify Account provided Broadband Included: 200GB Broadband Cost (above included limit): 0.2/GB Gold account: Total daytime calls cost: 12.0 Display details

Total daytime calls cost: 0.0
Total evening calls cost: 0.0
Total (autor) broadband costs

Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided Music On Demand provided

Gold account is cheapest cost

Total evening calls cost: 5.0

Total (extra) broadband cost: 26.0

Total cost: 78.0

Account summary for Silver account

Package cost: 45.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 130 Broadband Included: 300GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 12.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 3.0

Total cost: 60.0

Spotify Account provided

Account summary for Gold account

Package cost: 60.0

Cost of daytime calls: 0.0/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 230 Broadband Included: 2000GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 0.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided

Music On Demand provided

Gold account is cheapest cost

Pass

Daytime mins: 50

Evening/weekend mins: 80

GB used: 230

Use data that results in the bronze and silver accounts having the same total cost.

Bronze account:

Display details

Total daytime calls cost: 6.0
Total evening calls cost: 4.0

Total (extra) broadband cost: 6.0

Total cost: 51.0

Silver account: Display details

Total daytime calls cost: 6.0 Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 51.0

Spotify Account provided

Gold account: Display details

Total daytime calls cost: 0.0
Total evening calls cost: 0.0
Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided Music On Demand provided

Silver account is cheapest cost

Please enter the number of daytime minutes used per

month: 50

Please enter the number of nighttime minutes used per

month: 80

Please enter the number of Gigabytes used per month:

230

Account summary for Bronze account

Package cost: 35.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.05/min

Number of Channels: 60 Broadband Included: 200GB

Broadband Cost (above included limit): 0.2/GB

Total daytime calls cost: 6.0

Total evening calls cost: 4.0

Total (extra) broadband cost: 6.0

Total cost: 51.0

Account summary for Silver account

Package cost: 45.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 130 Broadband Included: 300GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 6.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 51.0

Spotify Account provided

Account summary for Gold account

Package cost: 60.0

Cost of daytime calls: 0.0/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 230 Broadband Included: 2000GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 0.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 60.0

	Spotify Account provided
	Music On Demand provided
	Silver account is cheapest cost
	Pass

Daytime mins: 120

Evening/weekend mins: 240

GB used: 2500.

Use a high broadband usage that's above the gold accounts limit.

Bronze account:

Display details

Total daytime calls cost: 14.4 Total evening calls cost: 12.0

Total (extra) broadband cost: 460.0

Total cost: 521.4

Silver account: Display details

Total daytime calls cost: 14.4 Total evening calls cost: 0.0

Total (extra) broadband cost: 220.0

Total cost: 279.4

Spotify Account provided

Gold account: Display details

Total daytime calls cost: 0.0 Total evening calls cost: 0.0

Total (extra) broadband cost: 50.0

Total cost: 110.0

Spotify Account provided Music On Demand provided

Gold account is cheapest cost

Please enter the number of daytime minutes used per

month: 120

Please enter the number of nighttime minutes used per

month: 240

Please enter the number of Gigabytes used per month:

2500

Account summary for Bronze account

Package cost: 35.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.05/min

Number of Channels: 60 Broadband Included: 200GB

Broadband Cost (above included limit): 0.2/GB

Total daytime calls cost: 14.4

Total evening calls cost: 12.0

Total (extra) broadband cost: 460.0

Total cost: 521.4

Account summary for Silver account

Package cost: 45.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 130
Broadband Included: 300GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 14.4

Total evening calls cost: 0.0

Total (extra) broadband cost: 220.0

Total cost: 279.4

Spotify Account provided

Account summary for Gold account

Package cost: 60.0

Cost of daytime calls: 0.0/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 230 Broadband Included: 2000GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 0.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 50.0

Total cost: 110.0

	Spotify Account provided
	Music On Demand provided
	Music On Demand provided
	Gold account is cheapest cost
	Pass

Daytime mins: 125

Evening/weekend mins: 120

GB used: 220

Use input data that results in all accounts having the same total cost.

Bronze account:

Display details

Total daytime calls cost: 15.0 Total evening calls cost: 6.0

Total (extra) broadband cost: 4.0

Total cost: 60.0

Silver account:

Display details

Total daytime calls cost: 15.0
Total evening calls cost: 0.0
Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided

Gold account: Display details

Total daytime calls cost: 0.0
Total evening calls cost: 0.0
Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided Music On Demand provided

Gold account is cheapest cost

Please enter the number of daytime minutes used per

month: 125

Please enter the number of nighttime minutes used per

month: 120

Please enter the number of Gigabytes used per month:

220

Account summary for Bronze account

Package cost: 35.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.05/min

Number of Channels: 60 Broadband Included: 200GB

Broadband Cost (above included limit): 0.2/GB

Total daytime calls cost: 15.0

Total evening calls cost: 6.0

Total (extra) broadband cost: 4.0

Total cost: 60.0

Account summary for Silver account

Package cost: 45.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 130
Broadband Included: 300GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 15.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 60.0

Spotify Account provided

Account summary for Gold account

Package cost: 60.0

Cost of daytime calls: 0.0/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 230 Broadband Included: 2000GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 0.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 60.0

	Spotify Account provided
	Music On Demand provided
	music on Demand provided
	Gold account is cheapest cost
	Pass

Daytime mins: -1,-7,100 Evening/weekend mins: -100,120

GB used: -56,250

Use negative inputs to see if program behaves correctly

Please enter the number of daytime minutes used per month: -

Please enter the number of daytime minutes used per month: -

Please enter the number of daytime minutes used per month: 100

Please enter the number of nighttime minutes used per month: -100

Please enter the number of nighttime minutes used per month: 120

Please enter the number of Gigabytes used per month: -56 Please enter the number of Gigabytes used per month: 250

Bronze account: Display details Display totals

Silver account: Display details Display totals

Gold account: Display details Display totals

Output cheapest account

Please enter the number of daytime minutes used per

month: -1

Please enter the number of daytime minutes used per

month: -7

Please enter the number of daytime minutes used per

month: 100

Please enter the number of nighttime minutes used per

month: -100

Please enter the number of nighttime minutes used per

month: 120

Please enter the number of Gigabytes used per month: -56

Please enter the number of Gigabytes used per month:

250

Account summary for Bronze account

Package cost: 35.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.05/min

Number of Channels: 60 Broadband Included: 200GB

Broadband Cost (above included limit): 0.2/GB

Total daytime calls cost: 12.0

Total evening calls cost: 6.0

Total (extra) broadband cost: 10.0

Total cost: 63.0

Account summary for Silver account

Package cost: 45.0

Cost of daytime calls: 0.12/min

Cost of evening and weekend calls: 0.0/min

Number of Channels: 130 Broadband Included: 300GB

Broadband Cost (above included limit): 0.1/GB

Total daytime calls cost: 12.0

Total evening calls cost: 0.0

Total (extra) broadband cost: 0.0

Total cost: 57.0

Spotify Account provided

Account summary for Gold account

Package cost: 60.0

Cost of daytime calls: 0.0/min

Cost of evening and weekend calls: 0.0/min

	Number of Channels: 230
	Broadband Included: 2000GB
	Broadband Cost (above included limit): 0.1/GB
	Total daytime calls cost: 0.0
	Total evening calls cost: 0.0
	Total (extra) broadband cost: 0.0
	Total cost: 60.0
	Spotify Account provided
	Music On Demand provided
	Silver account is cheapest cost
	Pass
	<u> </u>

Part d)

Create a class called 'Platinum Account' and make it extend the GoldAccount class. Create a method getBroadband which will override the method in the StandardAccount and this method should now return a string. Create another method getTotalBroadband which will also override the method with the same name In the StandardAccount class and make it return 0 as the Platinum Account has no cost for broadband usage. Finally instantiate a new object,

which will be of type Platinum Account, in the AccountUser class, where the main method resides, with the parameters that define a Platinum Account and for the broadband parameter just input 0.