**Reviewing Assignment**

Lab Assignment 4

|  |  |
| --- | --- |
| Started: | Oct 26, 2014 9:24 PM |
| Finished: | Oct 29, 2014 11:39 AM - late |

 1 of 1

**Lab Assignment 4     Total Grade: 14   (of possible 20 points)**

**Score: 14   (of possible 20 points)**

**Assignment 4 - Free Frozen Yogurt**

Select one option from below.  All (both) options are worth the same number of points.  The more advanced option(s) are provided for students who find the basic one too easy and want more of a challenge.   Make sure you have read and understood

* both ***modules A*** and ***B*** this week, and
* ***module 2R - Lab Homework Requirements***

before submitting this assignment. Hand in only one program, please.

OPTION A (Basic):  Single-Customer Rewards System

Understand the Application

Foothill Fro-Yo, LLC, gives customers a stamp every time they purchase a yogurt.  After they earn a certain number of stamps, they qualify for a free yogurt, which they may use toward the purchase of a single yogurt.

Usually 10 is the number of stamps that qualifies, but we will let this be a symbolic constant which we can change. But for the purposes of this section, let's say that ***10 stamps*** earns a free yogurt.

The program will be an ***app*** that runs at the point-of-purchase (cash register counter).  The customer or cashier will process a looping series of ***purchase transactions***.  Normally, each transaction asks how many yogurts the customer wants to buy and then awards them one ***stamp*** for each yogurt.  However, if, at the start of a new transaction, the system detects that the customer has previously earned 10 or more ***credits*** (= ***stamps***), the system will inform the operator (customer or cashier) and give the operator the option of using ***10 credits*** toward a ***free yogurt***.  The customer may ***accept the free yogurt***, in which case the number of stamps in his account is decreased by 10, and a single free yogurt is dispensed, or the customer ***declines***, which turns this into a ***normal transaction***, allowing the customer to purchase one or more yogurts, adding to the credits that the customer already has.

Besides offering a ***purchase transaction*** each pass of the main execution loop, the only other choice is for the operator to ***shut down*** the system for the day.

So the main loop has two choices:  **P**:  process a **P**urchase, or **S**: **S**hut down.

Because we don't have arrays yet, this has to be a single-customer system.

The Program Spec

Process transactions in main loop.  Start the user's stamp balance at 0.  Then enter a user-input loop, which gives the user two choices at each pass of the loop:

* **P** (process a **P**urchase)
* **S** (**S**hut down.)

The user is allowed to enter a ***single character*** or ***an entire word***, and the program continues until and unless the user has entered an **"s"**, "**S**", "**S**hut down", "**s**tratford", or any word beginning with an upper or lower case **'s'**,  in which case the program should end.  If the user enters a word that starts with any character other than a **'P'** or **'S'**(upper or lower case), the letter is ignored and the main menu is repeated, starting a new loop.

**Specifics of the P Selection**

If the operators chooses 'P', then the program checks to see how many credits the customer has. (Remember, in this simplified exercise, there is only one customer.)  If there are fewer than the qualifying number (set to 10), then a normal transaction is executed.  If there are 10 or more credits in the customer's account, an award transaction is executed.

Normal Transaction

Ask the user/operator how many yogurts are being purchased, and add this number to the customers account/wallet/stamps.

Award Transaction

Tell the user/operator that the customer qualifies for a free yogurt.

1. If the user opts for a free yogurt, give them one yogurt and end the transaction, moving on to the next pass.  To keep things simple, we will not allow purchase of multiple yogurts when an award yogurt is being redeemed.  We reduce the number of credits by 10 (or whatever the qualifying number is for our system).  We don't add any credits/stamps for the award yogurt.  Even if the user has, say, 24 stamps, they can only get one yogurt in a single transaction, and the new balance will be 24 - 10 = 14, allowing the user to get another free yogurt on the next transaction.
2. If the user opts to not take the award, then the sequence of events turns into a ***Normal Transaction***, in which the user can request to purchase one or more yogurts and the corresponding number of stamps is credited to the customer's balance.

**Input Errors**

Whenever the user makes an input error, cancel the transaction and proceed to the next loop pass (i.e., don't end the program).  Do not attempt to keep the user in some sort of micro user-input loop, forcing them to stay within that transaction.

Always check for invalid user input like an invalid character choice, a negative number or an out-of-range numeric value, before proceeding.  If the user commits an error of any kind (a bad command letter such as '**T**' or an out-of-range amount), print an error message and return to the top of the main loop which asks the user for another command: **P** or **S**.

There is one exception to the error check just described. When it is time for the user to enter a number, you can assume he does not type some non-numeric value.  You don't have to test for this kind of non-numeric error.

**Test Run Requirements**:

Submit at least two runs that shows everything.  In each run, show ***several*** cycles (passes) of the loop.  Demonstrate all options. Also demonstrate the capacity to get either single letters or entire words from the user, showing at least one user-input error (an illegal choice) and one bad numeric input (out-of-range error).

A (partial) sample run is given at the bottom of this page.

*Use****symbolic constants****, not literals, for everything you can in this (and all) assignments.*

OPTION B-1 (Intermediate)

In the case of a rewards transaction, allow the user to purchase as many yogurts as in a normal transaction, and use as many of the rewards as he wishes.  For example, if the user has 24 credits and wants 3 yogurts, he can opt for 1 free yogurt, pay for 2, and end up with 24 - 10 + 2 = 16 credits.  Or he can opt for 2 free yogurts, pay for 1 and end up with 24 - 20 + 1 = 5 credits.

OPTION B-2 (Intermediate)

Augment the basic option as follows. Assume there are *N* customers, with ID numbers 0, 1, 2, ..., *N*-1.  Each customer has his own account balance of stamp credits.  At the start of each P transaction, ask for a customer ID (0 to *N*-1), and apply the transaction, as before, but apply it to the correct customer.

*Note:  I probably will not have instructor solutions for these options.*

Sample Output for Option A

Here is an example of a partial working run:

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy ?

4

You just earned 4 stamps and have a total of 4 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy ?

2

You just earned 2 stamps and have a total of 6 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy ?

5

You just earned 5 stamps and have a total of 11 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

y

You have just used 10 credits and have 1 left.

Enjoy your free yogurt.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy ?

1

You just earned 1 stamps and have a total of 2 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy ?

2

You just earned 2 stamps and have a total of 4 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy ?

5

You just earned 5 stamps and have a total of 9 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: 1

\*\*\* Use P or S, please. \*\*\*

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy ?

2

You just earned 2 stamps and have a total of 11 to use.

... etc.

**Answer**

* text/plain[foothillAssignment4.txt](https://myetudes.org/access/mneme/content/private/mneme/cff3240c-b51c-41f6-80dc-4db4530bdd05/submissions/14962600/c5d803d5-efc7-4ba6-00da-18db29c71995/foothillAssignment4.txt)

[[https://myetudes.org/ambrosia_library/icons/collapse.gif](https://myetudes.org/portal/tool/09d2d876-2329-4a14-000d-b3da1e731165/review/14962600/list) Model Answer](https://myetudes.org/portal/tool/09d2d876-2329-4a14-000d-b3da1e731165/review/14962600/list)

/\* CS 1A Lab 4

 \* Instructor Solution

 \*/

import java.util.Scanner;

public class Foothill

{

   public static void main (String[] args) throws Exception

   {

      Scanner input = new Scanner(System.in);

      String userStr;

      char mainChoiceLetter = 'x',  // logic requires init.

            yesNoChoiceLetter;

      int length, userInt;

      final int QUALIFY = 10,

            MIN\_YOG = 1,

            MAX\_YOG = 10000;

      int numStamps;

      // initial values

      numStamps = 0;

      // Get menu choices from the user until s/he says quit.

      // (use do/while to force user to enter at least one response)

      do

      {

         System.out.print("\nMenu: " +

               "\n  P (process Purchase)" +

               "\n  S (Shut down) \n\n  Your Choice: ");

         userStr = input.nextLine();

         length = userStr.length();

         if (length < 1)

         {

            System.out.println("\n \*\*\* Please enter a valid choice. \*\*\*");

            continue;   // covers any reason the string is emptY.

         }

         mainChoiceLetter = Character.toUpperCase(userStr.charAt(0));   // store in letter

         if (mainChoiceLetter == 'S')

         {

            // shutting down -------------------------------------------

            System.out.println("\nSystem shutting down.");

            continue;  // let loop control detect the exit

         }

         else if (mainChoiceLetter != 'P')

         {

            // mainChoiceLetter is not one of the three legal types

            System.out.println("\n \*\*\* Use P or S, please. \*\*\*");

            continue;  // the main loop

         }

         // falling through means they requested purchase

         if (numStamps >= QUALIFY)

         {

            // award transaction ------------------------

            System.out.println("\nYou qualify for a free yogurt."

                  +" Would you like to use your credits? (Y or N) ");

            userStr = input.nextLine();

            length = userStr.length();

            if (length < 1)

            {

               System.out.println("\n \*\*\* Invalid choice. \*\*\*");

               continue;

            }

            yesNoChoiceLetter = Character.toUpperCase(userStr.charAt(0));

            if (yesNoChoiceLetter == 'Y')

            {

               // they want a free yog transaction -----

               numStamps -= QUALIFY;

               System.out.println("\nYou have just used " + QUALIFY

                     + " credits and have " + numStamps + " left."

                     +"\nEnjoy your free yogurt.");

            }

            else if (yesNoChoiceLetter != 'N')

            {

               // yesNoChoiceLetter is not one of the legal options

               System.out.println("\n \*\*\* Invalid response \*\*\*");

               continue;

            }

         }

         // normal transaction  for any reason --------------------------

         System.out.println("\nHow many yogurts would you like" +

               " to buy ? ");

         userStr = input.nextLine();

         userInt = Integer.parseInt(userStr);

         if (userInt < MIN\_YOG || userInt > MAX\_YOG)

         {

            System.out.println("\n \*\*\* Invalid # yogurts. \*\*\*");

            continue;

         }

         numStamps += userInt;

         System.out.println("\n You just earned " + userInt + " stamps"

               + " and have a total of " + numStamps + " to use.");

      }

      while (mainChoiceLetter != 'S');

      input.close();

      System.out.println("\nGood bye.\n");

   }

}

/\* ------------------ SAMPLE RUN -------------------------

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: d

 \*\*\* Use P or S, please. \*\*\*

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: push

How many yogurts would you like to buy ?

14

 You just earned 14 stamps and have a total of 14 to use.

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

n

How many yogurts would you like to buy ?

21

 You just earned 21 stamps and have a total of 35 to use.

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

j

 \*\*\* Invalid response \*\*\*

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

y

You have just used 10 credits and have 25 left.

Enjoy your free yogurt.

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

n

How many yogurts would you like to buy ?

2

 You just earned 2 stamps and have a total of 27 to use.

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: proc

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

y

You have just used 10 credits and have 17 left.

Enjoy your free yogurt.

Menu:

  P (process Purchase)

  S (Shut down)

  Your Choice: s

System shutting down.

Good bye.

--------------------------------------------------------- \*/

**Comments**

GENERAL ============================================  
  
- many style problems,. ode starting with

System.out.println(SEPARATOR + "How many yogurts would you like"

and several lines below is indented too far left causing incorrect reflection of the logic.  Also

else

{

System.out.println("Quantity cant be less than 0.");

}

missing indentation of block.

(-4)  
  
MAIN LOOP LOGIC  ===========================================  
  
\* used a while or do/while, which was the correct choice for the process/shutdown loop.  
\* placed the prompt/user-menu inside the loop where it belonged, once, rather that having it appear twice, needlessly.  great.  
 \* handled the P or S options in a simple set of mutually exclusive if statements with either continue or natural falling through to the end of the loop.  
  
MAIN LOOP TESTING FOR UPPER-LOWER CASE AND FIRST CHARACTER ===================  
  
\* you tested for both case and first character.

FREE YOGURT LOGIC  ===========================================  
  
\* #stamps to qualify was a symbolic constant, as it should be.  
\* separated a normal transaction from an award transaction.  
\* allowed for both upper and lower case Y/N and first letter of word tested, as before.  while not technically called out in the spec, it was the right thing to do.

Good work.  Just clean up that messy indentation and you'll be in good shape.

7 days late (-7) -> (-2) by agreement.

 1 of 1

import java.util.Scanner;

public class Foothill

{

static final String INDENT = " ";

static final String SEPARATOR = "\n";

static final char PURCHASE\_SELECT = 'P';

static final char STOP\_SELECT = 'S';

static final char YES\_SELECT = 'Y';

static final char NO\_SELECT = 'N';

static final int FREE\_YOGURT = 10;

public static void main(String[] args)

{

Scanner inputStream = new Scanner(System.in);

char userChoice;

int stampsQty = 0;

boolean sessionShutDown = false;

while (!sessionShutDown)

{

System.out.println(SEPARATOR + "Menu:");

System.out.println(INDENT + "P (process Purchase)");

System.out.println(INDENT + "S (Shut down)" + SEPARATOR);

System.out.print(INDENT + "Your Choice: ");

String userInput = inputStream.nextLine();

if (userInput.length() == 0)

{

continue;

}

userChoice = userInput.toUpperCase().charAt(0);

if (userChoice == PURCHASE\_SELECT)

{

if (stampsQty >= FREE\_YOGURT)

{

System.out.println(SEPARATOR + "You qualify for a free yogurt."

+ " Would you like to use your credits? (Y or N)");

userInput = inputStream.nextLine();

if (userInput.length() == 0)

{

continue;

}

userChoice = userInput.toUpperCase().charAt(0);

if (userChoice == YES\_SELECT)

{

stampsQty -= FREE\_YOGURT;

System.out.println(SEPARATOR + "You have just used "

+ FREE\_YOGURT + " credits and have " + stampsQty + " left."

+ SEPARATOR + "Enjoy your free yogurt.");

continue;

}

else if (userChoice == NO\_SELECT)

{

System.out.println("Thats ok you can use your stamps"

+ " next time");

}

else

{

System.out.println("\*\*\* Use Y or N, please. \*\*\*");

continue;

}

}

System.out.println(SEPARATOR + "How many yogurts would you like"

+ " to buy?");

userInput = inputStream.nextLine();

int yogurtQty = Integer.parseInt(userInput);

if (yogurtQty > 0)

{

stampsQty += yogurtQty;

System.out.print(SEPARATOR + "You just earned " + yogurtQty

+ " stamps and have a total of " + stampsQty + " to use."

+ SEPARATOR);

}

else

{

System.out.println("Quantity cant be less than 0.");

}

}

else if (userChoice == STOP\_SELECT)

{

sessionShutDown = true;

}

else

{

System.out.println("\*\*\* Use P or S, please. \*\*\*");

}

}

inputStream.close();

System.out.println(SEPARATOR + "Thank you for being a valued customer!");

}

}

/\*----------paste of run from console window------------

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy?

8

You just earned 8 stamps and have a total of 8 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

How many yogurts would you like to buy?

13

You just earned 13 stamps and have a total of 21 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

n

Thats ok you can use your stamps next time

How many yogurts would you like to buy?

2

You just earned 2 stamps and have a total of 23 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

hjkjgjh

\*\*\* Use Y or N, please. \*\*\*

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

y

You have just used 10 credits and have 13 left.

Enjoy your free yogurt.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: 345

\*\*\* Use P or S, please. \*\*\*

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

Nope

Thats ok you can use your stamps next time

How many yogurts would you like to buy?

-1

Quantity cant be less than 0.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: p

You qualify for a free yogurt. Would you like to use your credits? (Y or N)

n

Thats ok you can use your stamps next time

How many yogurts would you like to buy?

1

You just earned 1 stamps and have a total of 33 to use.

Menu:

P (process Purchase)

S (Shut down)

Your Choice: s

Thank you for being a valued customer!

----------------------------------------------------- \*/