**Project Objective**

As a developer, fix the bugs in the application using the appropriate algorithmic techniques.

**Problem Statement**

You have been assigned a few tasks during the sprint planning. Solving the bugs raised by the testing team is one among them. You are given the boilerplate code and are asked to complete it by fixing the bugs.

**Bugs to be fixed**

* Add the missing source code to the application based on searching technique. Find the appropriate comments to code for the searching technique.
* Write source code for sorting the predefined array and ensure the functionality of the application. Find the appropriate comments to code for sorting the predefined array.

**Source Code**

package com.org.fixbugs;

import java.util.ArrayList;

import java.util.Scanner;

public class Main {

public static void main(String[] args) {

/\*System.out.println("Hello World!");\*/

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

System.out.println("\tWelcome to TheDesk \n");

System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

optionsSelection();

}

private static void optionsSelection() {

String[] arr = {"1. I wish to review my expenditure",

"2. I wish to add my expenditure",

"3. I wish to delete my expenditure",

"4. I wish to sort the expenditures",

"5. I wish to search for a particular expenditure",

"6. Close the application"

};

int[] arr1 = {1,2,3,4,5,6};

int slen = arr1.length;

for(int i=0; i<slen;i++){

System.out.println(arr[i]);

// display the all the Strings mentioned in the String array

}

ArrayList<Integer> arrlist = new ArrayList<Integer>();

ArrayList<Integer> expenses = new ArrayList<Integer>();

expenses.add(1000);

expenses.add(2300);

expenses.add(45000);

expenses.add(32000);

expenses.add(110);

expenses.addAll(arrlist);

System.out.println("\nEnter your choice:\t");

Scanner sc = new Scanner(System.in);

int options = sc.nextInt();

for(int j=1;j<=slen;j++)

{

if(options==j)

{

switch (options)

{

case 1:

System.out.println("Your saved expenses are listed below: \n");

System.out.println(expenses+"\n");

optionsSelection();

break;

case 2:

System.out.println("Enter the value to add your Expense: \n");

int value = sc.nextInt();

expenses.add(value);

System.out.println("Your value is updated\n");

expenses.addAll(arrlist);

System.out.println(expenses+"\n");

optionsSelection();

break;

case 3:

System.out.println("You are about the delete all your expenses! \nConfirm again by selecting the same option...\n");

int con\_choice = sc.nextInt();

if(con\_choice==options){

expenses.clear();

System.out.println(expenses+"\n");

System.out.println("All your expenses are erased!\n");

} else {

System.out.println("Oops... try again!");

}

optionsSelection();

break;

case 4:

sortExpenses(expenses);

optionsSelection();

break;

case 5:

searchExpenses(expenses);

optionsSelection();

break;

case 6:

closeApp();

break;

default:

System.out.println("You have made an invalid choice!");

break;

}

}

}

sc.close();

}

private static void closeApp() {

System.out.println("Closing your application... \nThank you!");

}

private static void searchExpenses(ArrayList<Integer> arrayList)

{

Scanner s=new Scanner(System.in);

int leng = arrayList.size();

int e, f=0;

System.out.println("Enter the expense you need to search:");

//Complete the method

e=s.nextInt();

//using binary search to find the expense provided by the user

int mid=(f+leng)/2;

while(f<=leng)

{

if(arrayList.get(mid)<e)

{

f = mid + 1;

}

else if(arrayList.get(mid)==e)

{

System.out.println("Expense found\n");

break;

}

else

{

leng=mid-1;

}

mid = (f+leng)/2;

}

if(f>leng)

{

System.out.println("Expense not found\n");

}

}

private static void sortExpenses(ArrayList<Integer> arrayList)

{

int arrlength = arrayList.size();

//Complete the method. The expenses should be sorted in ascending order.

//using selection sort to sort the expenses in ascending order

for(int i=0;i<arrlength-1;i++)

{

int index =i;

for(int j=i+1;j<arrlength;j++)

{

if(arrayList.get(j)<arrayList.get(index))

{

index =j;

}

}

int temp = arrayList.get(index);

arrayList.set(index, arrayList.get(i));

arrayList.set(i, temp);

}

System.out.println("All the Expenditures in sorted order are:");

System.out.println(arrayList+"\n");

}

}