Fix the bugs in the application using the appropriate algorithmic techniques.

Code:

**import** java.util.ArrayList;

**import** java.util.Scanner;

**public** **class** BugFix {

**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]);

}

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**;

}

}

}

}

**private** **static** **void** closeApp() {

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

}

**private** **static** **void** searchExpenses(ArrayList<Integer> arrayList) {

Scanner in = **new** Scanner (System.***in***);

**int** key, leng = arrayList.size();

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

key = in.nextInt();

**int** left = 0;

**int** right = leng - 1;

**int** position = -1;

// run loop from 0 to right

**for** (left = 0; left <= right;)

{

**if** (arrayList.get(left) == key)

{

position = left;

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

**break**;

}

**if** (arrayList.get(right) == key)

{

position = right;

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

**break**;

}

left++;

right--;

}

// if element not found

**if** (position == -1)

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

//Completed the method

}

**private** **static** **void** sortExpenses(ArrayList<Integer> arrayList) {

**int** arrlength = arrayList.size();

**int** i,temp;

**boolean** flag = **true**;

**while** ( flag )

{

flag= **false**;

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

{

**if** ( arrayList.get(i) > arrayList.get(i+1) )

{

temp = arrayList.get(i);

arrayList.set(i, arrayList.get(i+1));

arrayList.set(i + 1, temp);

flag = **true**;

}

}

}

System.***out***.println("Sorted Expenses:");

**for**(i=0; i<arrlength; i++) {

System.***out***.print( arrayList.get(i)+", ");

}

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

//Completed the method. The expenses are sorted in ascending order.

}

}