Homework #8 Solution
(Java Programming for Beginners - OnLine)

Demo: The following code is a procedural way of writing code. It prints the weekly temperature, finds the min and max, and the average as well.

```
int weeklyTemp[] = { 69, 70, 71, 68, 66, 71, 70 };
int i, max = 0, min = 0;

// print temperatures
for (i = 0; i < weeklyTemp.length; i++) {
      System.out.printf("\nThe temperature on day %d " +
                              "was %d: ", i + 1,
                  weeklyTemp[i]);
}
System.out.printf("\n\n");

// find the max, min temperature
for (i = 0; i < 7; i++) {
      if (i == 0)
            max = min = weeklyTemp[i];
      if (weeklyTemp[i] > max)
            max = weeklyTemp[i];
      if (weeklyTemp[i] < min)
            min = weeklyTemp[i];
}
System.out.printf("The Minimum temperature is: %d\n", min);
System.out.printf("The Maximum temperature is: %d\n", max);

// get average
float total = 0, average;
for (i = 0; i < 7; i++)
      total += weeklyTemp[i];
average = total / weeklyTemp.length;
System.out.println("The average temperage for the week is:
                        " + average);
```

8.1 Now, modify the above code, which is all in one place, and break it into multiple methods. Try to convert each piece of important code into static method.

a) Write a method called getTemperatures. Which asks the user to enter 7 temperatures for the week

Solution:

```
static void getTemperatures(int[] temps, int arraySize) {
      int i;
      Scanner readInput = new Scanner(System.in);

      for (i = 0; i < arraySize; i++) {
            System.out.printf("Enter the temp: ");
            temps[i] = readInput.nextInt();
      }
      System.out.printf("\n\n");
}
```

b) Write a method called printTemperatures. Which prints the 7 temperatures for the week:

Solution:

```
static void printTemperatures(int[] T, int size) {
      int i;
      for (i = 0; i < size; i++) {
            System.out.printf("\nThe temperature on day %d was
                              %d: ", i + 1,T[i]);
      }
      System.out.printf("\n\n");
}
```

c) Write a method called getMax, which returns the maximum temperature of the week.

Solution:

```
static int getMax(int[] T, int size) {

      int i, max = 0;
      // find the min temperature
      for (i = 0; i < 7; i++) {
            if (i == 0)
                  max = T[i];
            if (T[i] > max)
                  max = T[i];
```

```
        }
        return max;
    }
```

d) Write a method called getMin, which returns the minimum temperature of the week.

Solution:

```
    static int getMin(int[] T, int size) {

        int i, min = 0;
        // find the min temperature
        for (i = 0; i < 7; i++) {
            if (i == 0)
                min = T[i];
            if (T[i] < min)
                min = T[i];
        }
        return min;
    }
```

e) Write a method called getAverage, which returns the average temperature of the week.

Solution:

```
    static float getAverage(int[] weeklyTemp, int arraySize) {
        int i;
        float total = 0, average;
        for (i = 0; i < 7; i++)
            total += weeklyTemp[i];
        average = total / arraySize;

        return average;
    }
```

f) Write a method called printStatistics that prints minimum, maximum and average of the week using above method

Solution:

```
    static void printStatistics(int[] T, int size) {

        System.out.printf("The minimum of weekly temperature is:
                          %d\n", getMin(T, size));
        System.out.printf("The maximum of weekly temperature is:
                          %d\n", getMax(T, size));
        System.out.printf("The average of weekly temperature is:
                          %5.2f\n", getAverage(T, size));
```

```
}
```

g) Write the code in main to call all these functions

Solution:

```
public static void main(String[] args) {

     System.out.println("\nCalling methods to do the
                         work:");
     int [] weeklyTemp = new int[7];
     getTemperatures(weeklyTemp, 7);
     printTemperatures(weeklyTemp, 7);
     printStatistics(weeklyTemp, 7);
          //in turn calls getMin, getMax, and getAverage;
 }
```

Demo: Here is the solution for Homework# 4.6. It is written as a procedural program.

```
     System.out.println("\nUsing for-loop and user values:
                        ");
     int x, y;
     char hChar1, vChar1;
     int  ht1, wd1;
     char answer = 'y';

     Scanner input1 = new Scanner(System.in);

     while (answer == 'y') {
          System.out.print("\nPlease enter height of a
                           box: ");
          ht1 = input1.nextInt();
          System.out.print("\nPlease enter width of a box:
                           ");
          wd1 = input1.nextInt();

          input1.nextLine(); //clean the buffer
          System.out.print("\nPlease enter the horizontal
                           charcters to draw box: ");
          hChar1 = input1.nextLine().charAt(0);
          System.out.print("\nPlease enter the vertical
                         charcters to draw box: ");
          vChar1 = input1.nextLine().charAt(0);
```

```
            for (x=1; x<= wd1;x++)
            {
                  System.out.print("" + hChar1);
            }
            System.out.print("\n");
            for(x=1;x<= ht1-2;x++)
            {
                  System.out.print(""+ vChar1);
                  for (y=1;y <= wd1-2;y++)
                        System.out.print(" ");
                  System.out.print("" + vChar1 + "\n");
            }
            for(x=1;x<= wd1;x++)
            {
                  System.out.print(hChar1);
            }
            System.out.print("\n\n");

            System.out.print("Continue? Type 'y' for yes:
                              ");
            answer = input1.nextLine().charAt(0);
      }
      System.out.println("\n\nThank you for using my draw
                        box program");
```

8.2 Now, modify and break the above code into four methods:

a) A method, drawHorizontalLine, which draws horizontal lines
"----------"

Solution:

```
static void drawHorizontalLines(int wd1, char hChar1) {
      int x;
      for (x=1; x<= wd1;x++) {
            System.out.print("" + hChar1);
      }
      System.out.print("\n");
}
```

b) A method, drawVerticalLine, which draws vertical lines

```
"|      |"
"|      |"
"|      |"
```

Solution:

```
static void drawVerticalLines(int wd1, int ht1, char
                                                vChar1) {
      int x, y;
      for(x=1;x<= ht1-2;x++)
      {
            System.out.print(""+ vChar1);
            for (y=1;y <= wd1-2;y++)
                  System.out.print(" ");
            System.out.print("" + vChar1 + "\n");
      }
}
```

c) A method, drawBox, which calls the drawHorizontalLine, and drawVerticalLine to draw the box

Solution:

```
static void drawBox(int wd1, int ht1, char hChar1, char
                                                vChar1) {
      drawHorizontalLines(wd1, hChar1);
      drawVerticalLines(wd1, ht1, vChar1);
      drawHorizontalLines(wd1, hChar1);
      System.out.print("\n\n");
}
```

d) Call drawBox from main

Solution:

```
System.out.println("\nUsing methods: ");
//utilizing the variables from above

int x, y;
char hChar1, vChar1;
int  ht1, wd1;
char answer = 'y';

while (answer == 'y') {
      System.out.print("\nPlease enter height of a
                        box: ");
      ht1 = input1.nextInt();
      System.out.print("\nPlease enter width of a box:
                       ");
      wd1 = input1.nextInt();

      input1.nextLine(); //clean the buffer
      System.out.print("\nPlease enter the horizontal
                  charcters to draw box: ");
      hChar1 = input1.nextLine().charAt(0);
      System.out.print("\nPlease enter the vertical
                 charcters to draw box: ");
      vChar1 = input1.nextLine().charAt(0);

      drawBox(wd1, ht1, hChar1, vChar1);

      System.out.print("Continue? Type 'y' for yes:
                        ");
      answer = input1.nextLine().charAt(0);
}
System.out.println("\n\nThank you for using my draw
                    box program");
```