**Internet programming**

**Problem 1: [15 marks]**

Write an inheritance hierarchy for classes Shape, Parallelogram, Rectangle and Square. Use Shape as the super class of the hierarchy. Specify the instance variables and methods for each class. Some methods that you must implement for each sub class are:

> **Input method:** takes the input for each of the corner points.

> **Display method:** displays the corner points as shown in sample output below

> **calculateArea method:** calculates are returns area for each shape.

The private instance variables of Shape should be the x-y coordinate pairs for the four endpoints of the Shape. Write main that instantiates objects of your classes and outputs each object’s area (except Shape).

**Formulas for Area Calculation**

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**Hints:**

* Create and use a Point class to represent the corners of the shapes.
* If seems suitable you can mark shape class abstract
* To calculate height, width distance formula can be used

http://www.purplemath.com/modules/xyplane/dist07b.gif

* Sample output is given below:

|  |
| --- |
| Enter a number (1,2,3) to choose the shape   1. Square 2. Parallelogram 3. Rectangle   1  Enter coordinated for square:  Enter point 1( Top left Corner)  4.0  4.0  Enter point 2( Top right corner)  8.0  4.0  Enter point 3( Bottom left Corner)  4.0  0.0  Enter point 1( Bottom Right Corner)  8.0  0.0  Coordinates of square are:  (4.0,4.0), ( 8.0, 4.0 ), ( 4.0, 0.0 ), ( 8.0, 0.0)  Area is: 16.0 |

**Problem 2: [10 marks]**

Ask user for N i.e. number of integers he wants to input. Now create an array of size N and take its values as input from user. Once the input is complete display the integers in Ascending order.

For above task you have to create a class MyArray.

Data Members

* An integer Array
* Size

Constructors **:**

* Parameterized constructor taking array size as parameter

Member Functions

* void input ()
* void display ()
* void sort()
* void getSize()

**Problem 3: [10 marks]**

Write a program to sore attendance of a month. There are 4 weeks in a month and each week has 5 working days.

Declare a 2D array attendance. (*Some helping material related to 2D arrays is placed at \\printsrv\Teacher Data\Aisha\IP\Reading Material)* Populate array randomly with values between 1 to 50 (use the sample code given below to generate random numbers). Print attendance in tabular form. Print average of each week separately.

**Sample code to generate random number**

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| --- |
| **import** java.util.Random;  **class** test  {  **public** **static** **void** main(String[] ar)  {  // method 1 to generate random number  **int** x = (**int**)Math.*random*();  System.***out***.println("Random number 1:" + x);    // method 2 to generate random number (in a range)  Random rn = **new** Random();  **int** min=1;  **int** max=50;  System.***out***.print(rn.nextInt((max - min) + 1) + min);    }  } |