1) Write a class that contains a compound if statement and that may be used to compute the area of a square (area=side²) or a triangle (area=base*height/2) after prompting the user to type the first character of the figure name (S or T).

Example output:

If you want calculate area of square press S or T for area of triangle: T
Enter the base and the height of the triangle: 2 3
The area of triangle is: 3

Sol

//Student name
//Assignment# 3 Question #1
//Due Date: Mar 3, 2013
//--141/51 Computer Programming
//--This program computes the area of square or triangle, based on the user's choice

import java.util.Scanner;

public static void main(String[] args) {
    Scanner input=new Scanner(System.in);
    Float side;
    Float hight;
    Float base;
    System.out.println("Enter S to calculate area of square or T for area of triangle: ");
    String x=input.next();
    // test if user enter lower or upper case character
    if ((x.charAt(0)=='s')||(x.charAt(0)=='S')){
        System.out.print("Enter the side of square : ");
        side=input.nextFloat();
        System.out.printf("The area of square is :%f ",(side*side));
    }else
    if (((x.charAt(0)=='t')||(x.charAt(0)=='T'))){
        System.out.print("Enter the base and hight of the triangle: ");
        base=input.nextFloat();
        hight=input.nextFloat();
        System.out.printf("The area of the triangle is :%f",(base*hight)/2);
    }else
        System.out.println("Wrong choice");
}

2) Write a class that reads three integer numbers and prints the highest among them.

Sol

//Student name
//Assignment# 3 Question #2
//Due Date: Mar 3, 2013
//--141/51 Computer Programming
//--This program prints the highest among three values

public static void main(String[] args) {
    Scanner input=new Scanner(System.in);
    int x,y,z;
    System.out.print("Enter three values : ");
    x=input.nextInt();
3) Write a class that asks the user for the day number (0 to 6) and prints the day name (Saturday to Friday).

**Sol**

```java
public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    System.out.print("Enter the day number : ");
    int x=input.nextInt();
    if(x==0) System.out.print("Saturday");
    else if(x==1) System.out.print("Sunday");
    else if(x==2) System.out.print("Monday");
    else if(x==3) System.out.print("Tuesday");
    else if(x==4) System.out.print("Wednesday");
    else if(x==5) System.out.print("Thursday");
    else if(x==6) System.out.print("Friday");
    else System.out.print("Wrong value");
}
```

4) An electric power distribution company charges its domestic consumers as follows:

**Consumption Units Rate of Charge**

- 0-200 KD. 0.50 per unit
- 201-400 KD 100 plus 0.65 per unit excess of 200
- 401-600 KD. 230 plus 0.80 per unit excess of 400
- 601 and above KD. 390 plus 1.00 per unit excess of 600

Write a class Program to read the customer number and power consumed and prints the amount should be paid by the customer.
This program prints the charge of the power consumed by a customer.

```java
public static void main(String[] args) {
    Scanner S = new Scanner(System.in);
    int a, b, c, n;
    double g, amount;
    // read the input from the user
    System.out.print("Welcome customer Enter your number : ");
    n = S.nextInt();
    System.out.print("Enter your power consumed : ");
    a = S.nextInt();
    if ((a > 0) && (a <= 200)) {
        amount = a * .50;
        System.out.printf("the amount of customer %d is : \%f\n", n, amount);
    } else if ((a > 201) && (a <= 400)) {
        amount = 100 + (a - 200) * 0.65;
        System.out.printf("the amount of customer %d is : \%f\n", n, amount);
    } else if ((a > 401) && (a <= 600)) {
        amount = 230 + (a - 400) * 0.80;
        System.out.printf("the amount of customer %d is : \%f\n", n, amount);
    } else if (a > 601) {
        amount = 390 + (a - 600) * 1.00;
        System.out.printf("the amount of customer %d is : \%f\n", n, amount);
    }
}
```

5) Write a class that reads x1, y1, x2, y2 (2 points) and find the slope of the line that passes through these 2 points. Use the formula \( s = \frac{y2-y1}{x2-x1} \) to determine the slope. If \( x1 = x2 \), the line is vertical and the slope is undefined. The program should output the slope with an appropriate label, if the slope is undefined, it should give a suitable message.

```java
public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    int x1;
    int y1;
    int x2;
    int y2;
    System.out.println("Enter X1 and Y1");
    x1 = input.nextInt();
    y1 = input.nextInt();
    System.out.println("Enter X2 and Y2");
    x2 = input.nextInt();
    y2 = input.nextInt();
    if (x1 != x2) System.out.printf("the slope is \%f", (float)(y2 - y1) / (x2 - x1));
    else System.out.print("The slope does not exist");
}
```
6) Find the result of these JAVA expressions:

11 – 1.0 / 4 = 10.75
8 / (4 – 2) / 8 = 0
8 + 3 % 5 – 3 = 8
8 % 3 % 9 = 2
20 / 6 * 3 = 9
(0.5 + 1.5) / 4 = 0.5
30 / 4 % 9 = 7
8 / 2 + 2 = 6
27 % 7 + 2.5 = 8.5
22 % 5 + 13 / 2 = 8
15 / (4 + 2.0) = 2.5
6 + 10 % 5 * 2 = 6

7) Write a program that reads an integer (between 100 and 999) and finds and displays the result of multiplying all of its digits.

```java
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("Enter integer between 100 and 999");
        int num1 = input.nextInt();
        if((num1 >= 100) && (num1 <= 999)) {
            int num2 = num1 % 10;
            num1 = num1 / 10;
            int num3 = num1 % 10;
            num1 = num1 / 10;
            System.out.printf("The result of multiplying all of its digits is %d", num1 * num2 * num3);
        }
        else
            System.out.println("The integer is out of range");
    }
}
```

8) Find the output in these four cases:

if (x > 3) if (y < 8) S.o.p ("abc"); S.o.p("xyz"); if (x != 10) {S.o.p (“123”) ;} else S.o.p(“789”);}
### Output

<table>
<thead>
<tr>
<th>Value of x</th>
<th>Value of y</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>15</td>
<td>xyz 123</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>abc xyz 123</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>xyz 789</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>xyz 123</td>
</tr>
</tbody>
</table>