**Question 1 (6 marks)**

What's the output of the following program?

public class Rectangle{

private int x;

private int y;

private int width;

private int height;

public Rectangle(int xx, int yy, int ww, int hh){

x=xx;

y=yy;

width=ww;

height=hh;

System.out.println("A rectangle ("+width+"x"+height+") has been created!");

}

public RectangleexpandBy(int amount){

System.out.println(amount+" will be add to each side");

int xx=x-amount;

int yy=y-amount;

int ww=width+2\*amount;

int hh=height+2\*amount;

Rectangleresult= new Rectangle(xx,yy,ww,hh);

return result;

}

public int area(){

int result;

result=width\*height;

return result;

}

}

public class Test{

public static void main(String[]args){

Rectangle rect1= new Rectangle(1,7,4,6);

Rectangle rect2=rect1.expandBy(2);

int origArea=rect1.area();

System.out.println("The area of the original: "+origArea);

int expnArea=rect2.area();

System.out.println("The area of the expanded: "+expnArea);

System.out.println("The area was increased by 1:"+expnArea/origArea);

}

}

**Answer**

A rectangle (4x6) has been created!

2 will be add to each side

A rectangle (8x10) has been created!

The area of the original: 24

The area of the original: 80

The area was increased by 1:3

**Question 2 (2 marks)**

Write a main method that

 Reads a sequence of integer values from the keyboard,

 Stops when the sum of the values exceeds 100,

 Displays the number of values that are followed by a large rvalue.

Example: If the entered values are 20 15 25 12 5 18 60, then there are 3 values that are followed

By larger values (15 is followed by 25, and 5 is followed by 18, and 18 is followed by 60). The reading stops because the sum of the values exceeds100.

**Answer:**

public static void main(String [] args)

{

Scanner S = new Scanner(System.in);

int sum=0;

int count=0;

int num = 0;

int prev = 10000000;

while (sum <= 100)

{

num = S.nextInt();

sum += num;

if (num > prev)

{

count++;

}

prev = num;

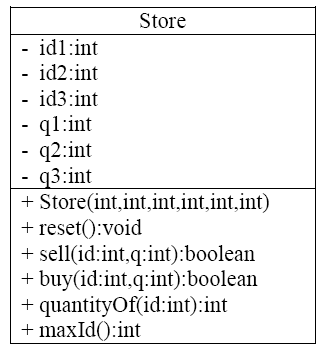
}

System.out.println(count);

}

**Question 3 (3 marks)**

The class Store is used to manage the quantities of three items.



 id1, id2, and id3, are respectively the identifiers of the three items

 q1, q2, and q3, are respectively the quantities of the three items

 The constructor initializes the identifiers and the quantities of the three products with values provided as parameters.

 The method reset sets the quantities of the three products to zero

 The method sell accepts an item identifier id and a quantity q as parameters and performs a sell operation with the given quantity on the given item, if possible. It returns true if the operation succeeds, and false otherwise.

 The method buy accepts an item identifier id and a quantity q as parameters and performs a buy operation with the given quantity on the given item, if possible. It returns true if the operation succeeds, and false otherwise.

 The method quantity Of accepts an item identifier id as parameter and returns its quantity. It returns -1if the identifier is not valid.

 The method maxId returns the identifier of the item that has the largest quantity.

Implement the class Store in Java.

**Answer:**

public class Store

{

private int id1,id2,id3,q1,q2,q3;

public Store(int a, int b, int c, int d, int e, int f)

{

id1=a; id2=b; id3=c;

q1=d; q2=e; q3=f;

}

public void reset()

{

q1=0; q2=0; q3=0;

}

public boolean sell(int id, int q)

{

if (id==id1 && q<=q1) {q1 -= q; return true;}

else if (id==id2 && q<=q2) {q2 -= q; return true;}

else if (id==id3 && q<=q3) {q3 -= q; return true;}

else { return false;}

}

public boolean buy(int id, int q)

{

if(id==id1) {q1 += q; return true;}

else if(id==id2) {q2 += q; return true;}

else if(id==id3) {q3 += q; return true;}

else { return false;}

}

public int quantityOf(int id)

{

if(id==id1) {return q1;}

else if(id==id2) {return q2;}

else if(id==id3) {return q3;}

else {return -1;}

}

public int maxId()

{

if (q1>q2 && q1>q3) {return id1}

else if (q2>q1 && q2>q3) {return id2}

else {return id3}

}

}

**Question 4 (4 marks)**

The class Store defined in Question 3 will be used in this question

You are given two objects obj1 and obj2 of the class Store.

Write the appropriate Java statements to perform the following tasks.

1. Create the object obj1.

obj1 = new Store (11, 22, 33, 10, 20, 30); // give any values you want

2. Ask the object obj1 for the service sell where the returned value is false.

boolean b = obj1.sell( 5899, 200 ); // 5899 is not an id

3. Ask the object obj1 for the service buy where the returned value is true.

boolean b = obj1.buy( 22, 100); // returns true cause 22 is an id

4. Assume here that the object obj2 is already created (don't create it). Display the largest quantity among the three items of the object obj2.

int id = obj2.maxId();

System.out.println( obj2.quantityOf( id ) );