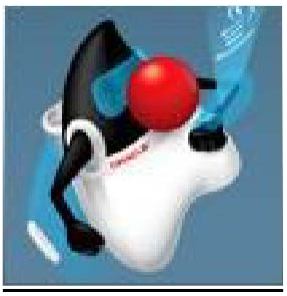

OCA 4: Operators

Exercises

Q1 – JAT4Ex1

The following question tests your understanding of relational operators. Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex1**.

public class JAT4Ex1{	Line 1
public static void main(String[] args){	Line 3
int x = 10;	Line 4
int y = 12;	Line 5
System.out.println(x>y);	Line 7
System.out.println(x>=y);	Line 8
System.out.println(x<y);	Line 9
System.out.println(x<=y);	Line 10
System.out.println(x==y);	Line 11
System.out.println(x!=y);	Line 12
System.out.println("**********");	Line 14
boolean a = true;	Line 16
boolean b = false;	Line 17
System.out.println(10 == 10);	Line 19
System.out.println('c' == 'b');	Line 20
System.out.println(a == b);	Line 21
System.out.println("**********");	Line 23
Cat c = new Cat();	Line 25
c.name = "Whiskers";	Line 26
Cat d = new Cat();	Line 27
d.name = "Tom";	Line 28
System.out.println(c == d);	Line 30
System.out.println(c != d);	Line 31
}	Line 32
}	Line 33

```
class Cat{
 String name;
}
```

Q2 – JAT4Ex2

The following question tests your understanding of the *instanceOf* operator. Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex2**.

```
public class JAT4Ex2{                                          Line 1

  public static void main(String[] args){                      Line 3
    Tree t = new Tree();                                       Line 4
    Oak o = new Oak();                                         Line 5
    Camera c = new Camera();                                   Line 6
    DisposableCamera d = new DisposableCamera();               Line 7
    Camera e = new DisposableCamera();                         Line 8

    System.out.println(o instanceof t);                        Line 10
    System.out.println(c instanceof Object);                   Line 11
    System.out.println(c instanceof Zoomable);                 Line 12
    System.out.println(t instanceof Zoomable);                 Line 13
    System.out.println(o instanceof Camera);                   Line 14
    System.out.println(d instanceof Zoomable);                 Line 15
    System.out.println(e instanceof Camera);                   Line 16
  }                                                            Line 17
}                                                              Line 18

class Tree{}

class Oak extends Tree{}

class Camera implements Zoomable{}

class DisposableCamera extends Camera{}

interface Zoomable{}
```

Please turn over

Q3 – JAT4Ex3

The following question tests your understanding of arithmetic operators. Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex3**.

```
public class JAT4Ex3{                                   // Line 1
  public static void main(String[] args){               // Line 2
    System.out.println(1 - 2 - 3);                      // Line 3
    System.out.println(1 - (2 - 3));                    // Line 4
    System.out.println(12 / 2 * 3);                     // Line 5
    System.out.println(12 / (2 * 3));                   // Line 6
    System.out.println(23 + 5 % 3);                     // Line 7
  }                                                     // Line 8
}                                                       // Line 9
```

Q4 – JAT4Ex4

The following question tests your understanding of the String Concatenation Operator. Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex4**.

```
public class JAT4Ex4{                                   // Line 1
  public static void main(String[] args){               // Line 2
    String a = "String";                                // Line 3
    int b = 3;                                          // Line 4
    int c = 7;                                          // Line 5
    System.out.println(a+b+c);                          // Line 6
    System.out.println((a+b)+c);                        // Line 7
    System.out.println(a+(b+c));                        // Line 8
    System.out.println(b+c+a);                          // Line 9
    System.out.println(b+c);                            // Line 10
  }                                                     // Line 11
}                                                       // Line 12
```

Please turn over

Q5 – JAT4Ex5

The following question tests your understanding of Increment / Decrement operators.

Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex5**.

```
public class JAT4Ex5{                                   // Line 1
  public static void main(String[] args){               // Line 2
      int a = 5;                                        // Line 3
      a--;                                              // Line 4
      System.out.println("The value of a is " + a);     // Line 5

       int v = 0;                                       // Line 7
       v = ++a;                                         // Line 8
       System.out.println("The value of v is " + v);    // Line 9
       System.out.println("The value of a is " + a);    // Line 10

       int y = 0;                                       // Line 12
       y = a++;                                         // Line 13
       System.out.println("The value of y is " + y);    // Line 14
       System.out.println("The value of a is " + a);    // Line 15

       int x = 0;                                       // Line 17
       x = a--;                                         // Line 18
       System.out.println("The value of x is " + x);    // Line 19
       System.out.println("The value of a is " + a);    // Line 20

       int r = 0;                                       // Line 22
       r = --a;                                         // Line 23
       System.out.println("The value of r is " + r);    // Line 24
       System.out.println("The value of a is " + a);    // Line 25

        final int h = r--;                              // Line 27
        System.out.println("The value of h is " + h);   // Line 28
        System.out.println("The value of r is " + r);   // Line 29
  }                                                     // Line 30
}                                                       // Line 31
```

Please turn over

Q6 – JAT4Ex6

The following question again tests your understanding of Increment / Decrement operators.

Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex6**.

```
public class JAT4Ex6{                                   // Line 1
   public static void main(String args[]){              // Line 2
      int c = 3;                                        // Line 3
      c++;                                              // Line 4
      System.out.println("The value of c is " + c);     // Line 5

      int w = 0;                                        // Line 7
      w = ++c;                                          // Line 8
      System.out.println("The value of w is " + w);     // Line 9
      System.out.println("The value of c is " + c);     // Line 10

      int x = 0;                                        // Line 12
      x = c++;                                          // Line 13
      System.out.println("The value of x is " + x);     // Line 14
      System.out.println("The value of c is " + c);     // Line 15

      int y = 0;                                        // Line 17
      y = --c;                                          // Line 18

      System.out.println("The value of y is " + y);     // Line 20
      System.out.println("The value of c is " + c);     // Line 21

      final int z = 10;                                 // Line 23
      int q = ++z;                                      // Line 24

      System.out.println("The value of z is " + z);     // Line 26
      System.out.println("The value of c is " + c);     // Line 27
      System.out.println("The value of q is " + q);     // Line 28
   }                                                    // Line 29
}                                                       // Line 30
```

Please turn over

Q7 – JAT4Ex7

The following question tests your understanding of the Ternary (Conditional) Operator.

Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex7**.

```
public class JAT4Ex7{
   public static void main(String args[]){
      // Ticket Sales
      int age = 12;
      double ticketPrice = (age<12) ? 4.50 : 12.50;
      System.out.println(ticketPrice);

      // Gold Coins
      boolean isCaptain = true;
      int goldCoins = (isCaptain == true) ? 10 : 5;
      System.out.println(isCaptain);

      //  Employee  Salary
      double mySalary = 26000;
      double taxDue = (mySalary >= 20000) ? (mySalary*0.35) : (mySalary*0.15);
      System.out.println(taxDue);

      // Student Travel Allowance
      boolean isStudent = true;
      double distanceThreshold = 10.00; // miles
      double distanceToTravel = 2.03;   // miles
      double travelAllowance = (isStudent == true)? (distanceToTravel>distanceThreshold)? 20 : 10 : 0;
      System.out.println(travelAllowance);

      // At the pub
      boolean isSober = true;
      age = 18;
      String admittance = (age >= 18) ? (isSober == true) ? "Enter" : "No Admittance - not sober" : "No
      Admittance - not overage";
      System.out.println(admittance);

      // At the ATM
      float customerBalance = 300.45f;
      float withdrawalRequest = 200.00f;
      float maxCashWithdrawal = 200.00f;
      String messageExcessCashRequest = "Sorry, the maximum cash withdrawal request is for 200 Euro.";
      String messageInsufficientFunds = "Sorry, you do not have sufficient funds for this transaction.";
      String messageSuffientFunds = "Withdrawl processed - please remove notes from dispenser.";

      String withdrawalOutcome = (withdrawalRequest > maxCashWithdrawal) ? messageExcessCashRequest :
      (withdrawalRequest > customerBalance) ? messageInsufficientFunds : messageSuffientFunds;

      System.out.println(withdrawalOutcome);
   }
}
```

Please turn over

Q8 – JAT4Ex8

The following question tests your understanding of Logical Operators.

Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex8**.

```
public class JAT4Ex8{
   public static void main(String args[]){

      // Q1:
      boolean x = false;
      int y = 6;

      if((x=true) & (++y==7)){
       System.out.println("Expression evaluates to true.");
      }else{
       System.out.println("Expression evaluates to false.");
      }

     // Q2:
     int z = 5;

     if(z++ > 5 || ++z > 6) z++;
      System.out.println("The value of z is: " + z);

     // Q3:
     int a = 2;
     int b = a++;

     if(b++ > 1  | --a > 2){
       --a;
       b--;
     }
     System.out.println("The value of a is: " + a);
     System.out.println("The value of b is: " + b);
   }
}
```

Please turn over

Q9 – JAT4Ex9

The following question again tests your understanding of Logical Operators.

Use a pen and paper to record your answers.

Now, to prove that you are correct, create the program using your favourite text editor / IDE.

Create a class named **JAT4Ex9**.

```
public class JAT4Ex9{
   public static void main(String args[]){
     // Q1:
     int x = 3;
     int y = 20;

     if ((x++>3) | (y-- < 20) && (x++ < y) ){
      System.out.println("The expression evaluates to true.");
     }else{
      System.out.println("The expression evaluates to false.");
     }

     System.out.println("The value of x is: " + x);
     System.out.println("The value of y is: " + y);

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

     // Q2:
     int a = 5;
     int b = 2;

     if ((a<30 ^ b<20) && (b < --a)){
      System.out.println("The expression evaluates to true.");
     }else{
      System.out.println("The expression evaluates to false.");
     }

    System.out.println("The value of a is: " + a);
    System.out.println("The value of b is: " + b);

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

    // Q3:
    int e = 3;
    int f = 2;

    if ((++e>--f ^ e < 4) | !(f < f--)){
      System.out.println("The expression evaluates to true.");
    }else{
      System.out.println("The expression evaluates to false.");
    }

    System.out.println("The value of e is: " + e);
    System.out.println("The value of f is: " + f);

  }
}
```

END OF EXERCISES