Practice Problems: Methods

1. For each program (total 5) below, show what is displayed on the screen when the code executes.

```java
import java.util.Arrays;
public class HelloWorld
{
  public static void main(String [] args)
  {
    int [] arr = {3, 5, 7};
    String arrStr = Arrays.toString(arr);  // call a unique static method
                                           // of class Arrays

    System.out.println(arrStr);

    int max = Math.max(1, -5);             // call a unique static method
                                           // of class Math

    System.out.println(max);               // call a unique static method
                                           // of class System. "out" is
                                           // a static final field

    String s = HelloWorld.getHello();      // call the unique static method
                                           // of class HelloWorld

    System.out.println(s);

    s = getHello();                        // call the unique static method
                                           // of class HelloWorld when this
                                           // call is inside the file/class
                                           // with this class.
    System.out.println(s);
}

  public static String getHello() {
    return "Hello, world!";
  }
}
```

```java
public class NestedCalls
{
  public static boolean mystery1(int a)
  {
    if(a > 0 && mystery2(-a)) {
      return true;
    }
    return false;
  }
```

```java
  public static boolean mystery2(int b)
  {
    if(b + 2 > 0) {
      return false;
    }
    return true;
  }

  public static void main(String [] args)
  {
    System.out.println("main");
    int x = 3;
    if(mystery1(x)) {
      System.out.println("mystery1 returns true");
    }
    System.out.prinltn("mystery2 = " + mystery2(x));
  }
}
```

```java
public class NamingAndScope
{
  public static void main(String [] args)
  {
    int x = 3;
    x = x();
    System.out.println(x);
    x = x(x+1);
    System.out.println(x);
    for(int i=0; i<2; i++) {
      x = x(x+3);
      System.out.println(x);
    }
  }

  public static int x()
  {
    int x = 5;
    return x + 7;
  }

  public static int x(int x)  // method overloading, compared with the above
  {                           //
    return x + 1;
  }
}
```

```
public class WhatsPrinted01 {
public static void func(int A[]) {
for (int i=1; i<A.length; i++)
A[i]+=A[i-1];
}

public static void main(String args[]) {
int A[] = {10,20,30};
func(A);
System.out.println(A[2]);
}
}

public class WhatsPrinted02 {
public static int func(int A[], int B[]) {
 A = B;
 return A[1];
}

public static void main(String args[]) {
 int A[] = {10,20,30};
 int B[] = {40,50,60};

 int x = func(A, B);
 System.out.println(x + " " + A[1]);
 }
}
```

2. Develop MethodSignature.java includes the following static methods.

a. Write a method that takes an integer X as an argument, and returns true if X is even, and false if X is odd..

b. Write a method that takes an integer N as an argument, and displays a square of NxN stars. Assume N is positive.

c. Write a method that takes a positive integer N as an argument, and returns true if N is prime, and false otherwise. Assume N > 1.

d. Write a method that takes an array of chars A, an integer j, and an integer k as arguments. The method should return a String consisting of the characters in A between positions j and k. Assume j and k are not out of range.