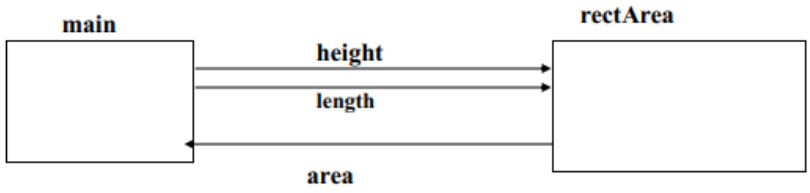
Methods

```
private static int calcRangeSum( int lo, int hi)
{
   int sum=0; // local variable - lives & dies in this method

   for (int i=lo ; i<=hi ; ++i)
      sum+=i;

   return sum; // sum of all the numbers from lo to hi
} // END calcRangeSum
```

- ***return* statement**
  - **transfer a value back from a function**
  - **you can only send back ONE piece of information**
  - **can only be used with functions that are non-void**
  - **e.g. private static float distance(int x1, int y1, int x2, int y2);**
  - **private static int taxcode(float salary);**



- **You can have variables with the same name in different methods.**

```
public static void main()
{
   int a = 4, b = 6, c;
   int a = 15, c = 9;  // ILLEGAL can't re-declare in same scope
}

private static void meth1(int x, int y){
   int a = 7, b = 5; // OK: different block i.e. {}
   ...
}

private static void meth2(int a, int b) // OK: different a & b
{
   int c; // OK: different c than main's
}
```

Remember parameters names do not have to match. The values match by **POSITION** inside the ()

Questions

In Java, which of the following statements is true:

A. Every executable program is a class
B. Every class is an executable program
C. Every class has a main method

```
1  import java.io.*;
2  import java.util.*;
3
4  public class Q5
5  {
6      public static void main(String[] args)
7      {
8          int[] arr = new int[5];
9          fillArr( arr );
10         for ( int i=0 ; i<arr.length ; ++i )
11             System.out.print( arr[i] +  " ");
12     }
13     static void fillArr( int []a )
14     {
15         for ( int i=0 ; i<a.length ; ++i )
16             a[i] = i*2;  // 0 2 4 6 8
17     }
18 }
```

What is the output?

A. 0 2 4 6 8
B. 0 0 0 0 0
C. null pointer exception
D. index out of bounds exception
E. none of the above

Questions

```java
import java.io.*;
import java.util.*;

public class Q7
{
    public static void main(String[] args)
    {
        int[] arr1 = { 0,2,4,6,8 };
        int[] arr2 = copyArr( arr1 );

        for ( int i=0 ; i<arr2.length ; ++i )
            System.out.print( arr2[i] +  " ");
    }
    static int[] copyArr( int[] src )
    {
        int[] copy = src;
        return copy;
    }
}
```

What is the output?

A. 0 2 4 6 8
B. 0 0 0 0 0
C. null pointer exception
D. index out of bounds exception
E. none of the above

What is true about the above?

A. the copyArr() method is copying all 5 ints from the src array to the copy array
B. the copyArr() method is just returning the reference value in arr1
C. none of the above

What is the output?

```java
/*      What is the output of the following code?
int[] arr = { 1, 3, 5, 7, 9, 11 };
for ( int i=0 ; i<arr.length-1 ; ++i )
    System.out.print( arr[i] + " " );
```

How do you traverse a 2D array?

Questions

What is the output/outcome produced by this code segment?

Assume input.txt has one line: 3 5 7 9 11 13

```
Scanner infile = new Scanner( new File( "input.txt" ) );
int[] arr = new int[ 10 ];
int count = 0;
while ( infile.hasNextInt() )
    arr[++count] = infile.nextInt();
for( int i=0 ; i<count ; ++i)
    System.out.print( arr[i] + " " );
```

Name an advantage of using ArrayList over arrays

Declare and initialize an ArrayList of Televisions and use a for each to print out each tv's toString().

```
List<Television> tvs = new ArrayList<Television>();
for (Television tv : tvs) {
    System.out.println(tv.toString());
}
```

Say we are trying to save student grades from a file into a data structure to give each entry a bonus point. Grades in the file are formatted per line like this:
" Alex Wang 91 "
We know the number of entries in advance. How might we implement this ?

We are scanning in user input inside a while loop until they type the String "exit", what data structure would be best to store the inputs for future searching?

A. String[] strs = …
B. ArrayList<String> strs =...
C. Object[] strs = ...
D. A and B

Questions

E. All of Above

How do we import ArrayList? And why do we need to import it?

Why do we not need to import data structures like Strings or arrays?

Why use StringBuilder instead of adding to a String like this

```
String partial = "hel";
String full = partial + "lo"; // hello
```

How would we index/access into the 2nd ‘D’ ?

```
ABA
BAD
ADA
*/
char[][] crosswordBoard = new char[3][3];
```

What is the point of having a separate class?

Why do we want to encapsulate data?

A. To prevent accidental access of public member fields
B. Enforce a structured way of mutating fields through setters
C. Hide data from other class files
D. All of the above

What is the point of a constructor?

Why would we want to create our own constructors for one class?

A. To pass different argument(s)
B. We get paid per line of code so the more code the merrier
C. The compiler will not create a default (no arg) c’tor when we make our own

Questions

D. A and C

Note lots of these questions are from Prof Hoffmans 401 class available at https://people.cs.pitt.edu/~hoffmant/F21-401/