CS0007 RECITATION

THURSDAYS 10:00A-10:50A

LIN ROJTAS (SLIDES ADAPTED FROM MICHAEL BARTLETT)

OVERVIEW

- Review of recent concepts
  - While/Do-While loops
  - For Loops
  - Reading/Writing Text Files
  - Exceptions
  - Arrays

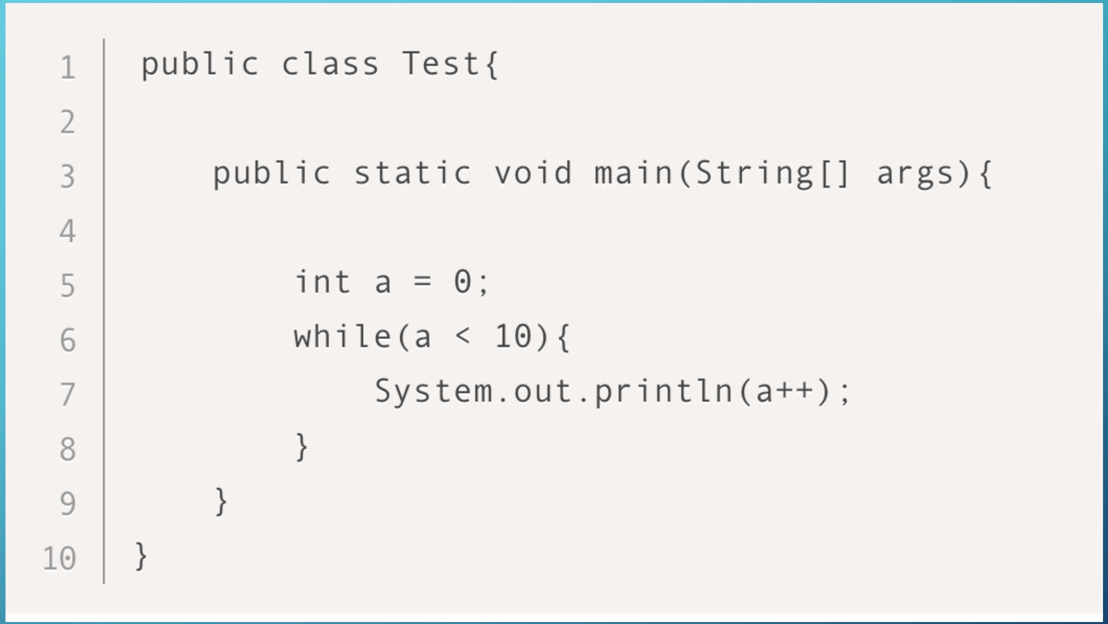
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. Code will print 1 to 9

C. Code will print 0 to 9

D. Code will print 1 to 10



```
public class Test{

    public static void main(String[] args){

        int a = 0;
        while(a < 10){
            System.out.println(a++);
        }
    }
}
```

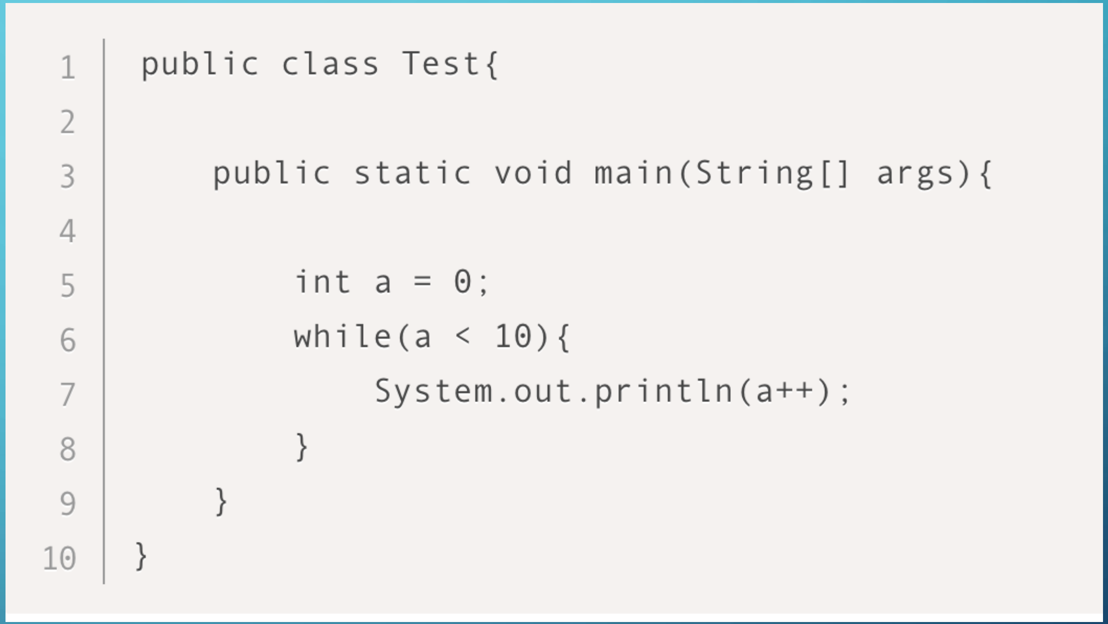
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. Code will print 1 to 9

C. Code will print 0 to 9

D. Code will print 1 to 10



```
public class Test{

    public static void main(String[] args){

        int a = 0;
        while(a < 10){
            System.out.println(a++);
        }
    }
}
```

Option C is the correct choice. Variable a is started with zero. Since a is incremented using post increment operator (a++), its value is printed first and then value gets incremented. When a is 9 then it is printed and incremented to 10, so in next while iteration a < 10 becomes false. Program will print 0 to 9.

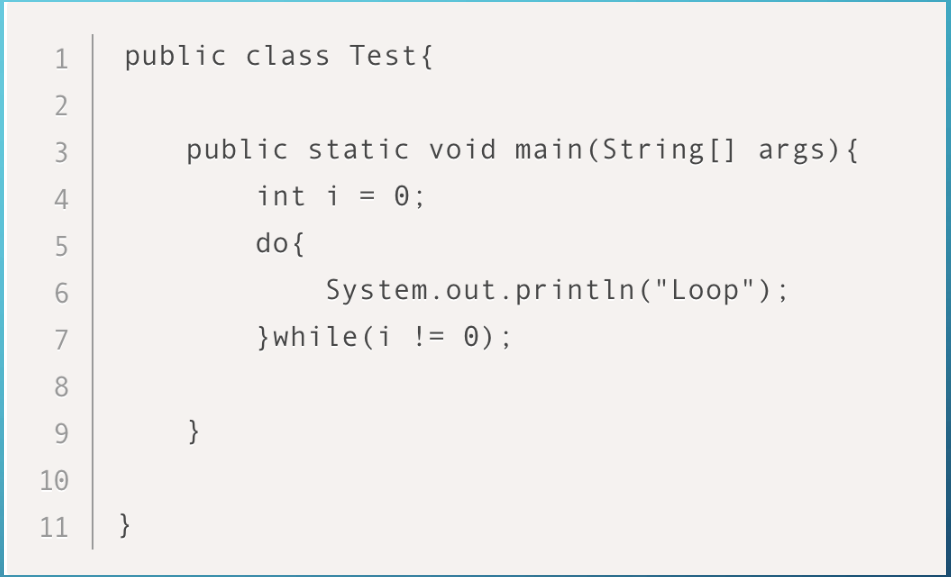
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. “Loop” will be printed once

C. ”Loop” will be printed infinite times

D. No output



```java
public class Test{

    public static void main(String[] args){
        int i = 0;
        do{
            System.out.println("Loop");
        }while(i != 0);

    }

}
```

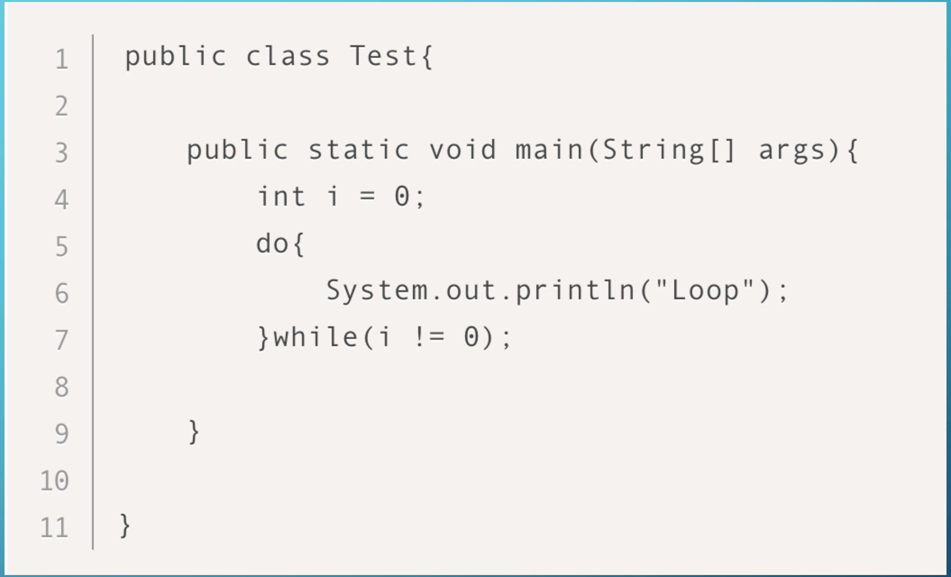
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. “Loop” will be printed once

C. ”Loop” will be printed infinite times

D. No output



```java
public class Test{

    public static void main(String[] args){
        int i = 0;
        do{
            System.out.println("Loop");
        }while(i != 0);

    }

}
```

Option B is the correct choice. Do while loop always has one iteration of the code block regardless of the condition. Code will execute and print “Loop”, then the condition will be checked which is false and hence the loop will be terminated.

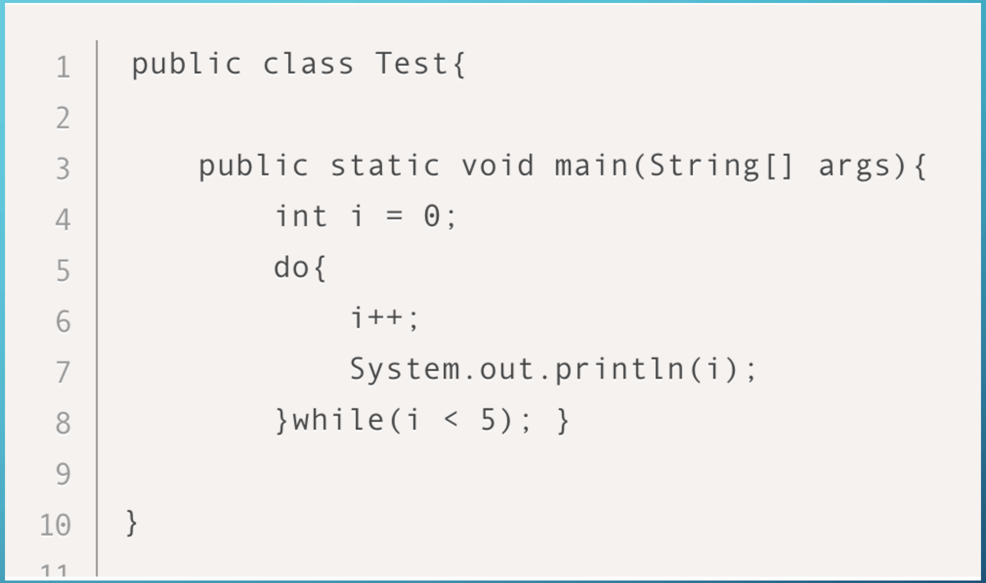
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. Code will print 0 to 4

C. Code will print 1 to 4

D. Code will print 1 to 5



```
public class Test{

    public static void main(String[] args){
        int i = 0;
        do{
            i++;
            System.out.println(i);
        }while(i < 5); }

}
```

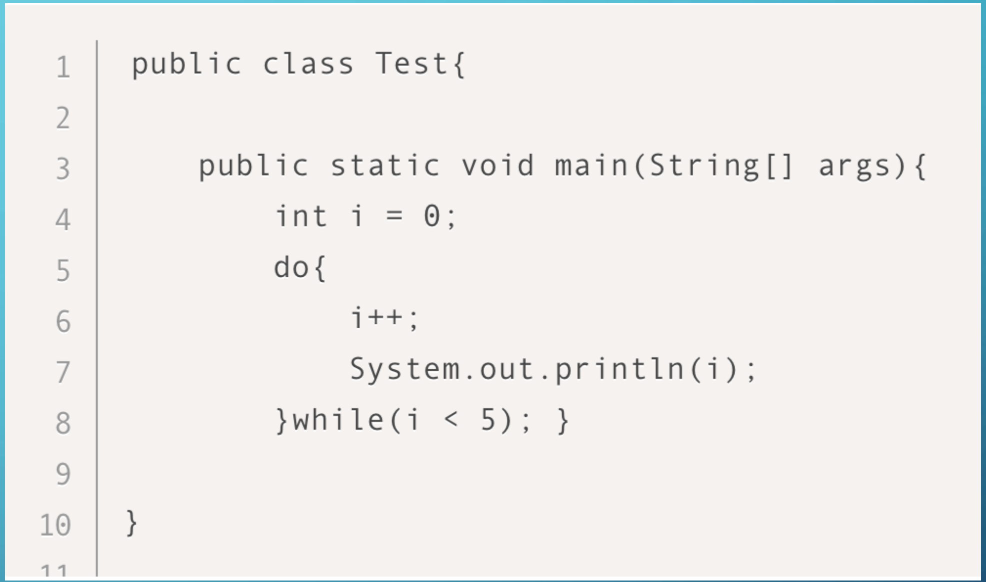
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. Code will print 0 to 4

C. Code will print 1 to 4

[✓ D. Code will print 1 to 5]



```
public class Test{

    public static void main(String[] args){
        int i = 0;
        do{
            i++;
            System.out.println(i);
        }while(i < 5); }

}
```

Option D is the correct choice. Do while loop always has one iteration of the code block regardless of the condition. Code will execute and increment i first and then print its value. This will go on until i equals 5 since the condition isn't checked until the end of the loop and i becomes equal to 5 within the loop.

REGARDLESS OF THE BOOLEAN CONDITION OF THE DO WHILE LOOP, THERE IS ALWAYS AT LEAST ONE ITERATION OF THE LOOP

A. True

B. False

REGARDLESS OF THE BOOLEAN CONDITION OF THE DO WHILE LOOP, THERE IS ALWAYS AT LEAST ONE ITERATION OF THE LOOP

A. True

B. False

True is the correct choice. Do while loop executes the code block once and then checks for the associated condition. If it is true, it continues to the next iteration otherwise control goes out of the loop to the next statement in code.

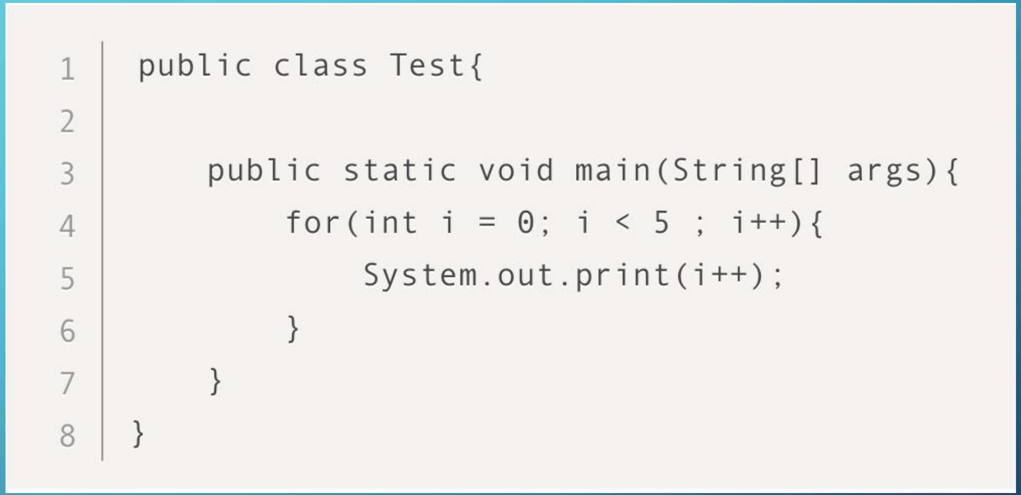
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. 01234

C. 135

D. 024



```java
public class Test{

    public static void main(String[] args){
        for(int i = 0; i < 5 ; i++){
            System.out.print(i++);
        }
    }
}
```

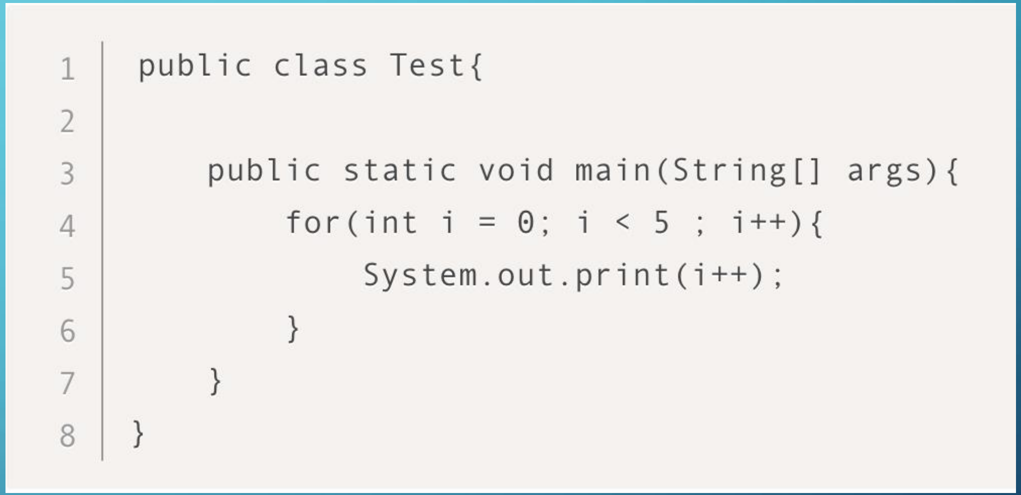
WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. Compilation error

B. 01234

C. 135

D. 024



```
public class Test{

    public static void main(String[] args){
        for(int i = 0; i < 5 ; i++){
            System.out.print(i++);
        }
    }
}
```

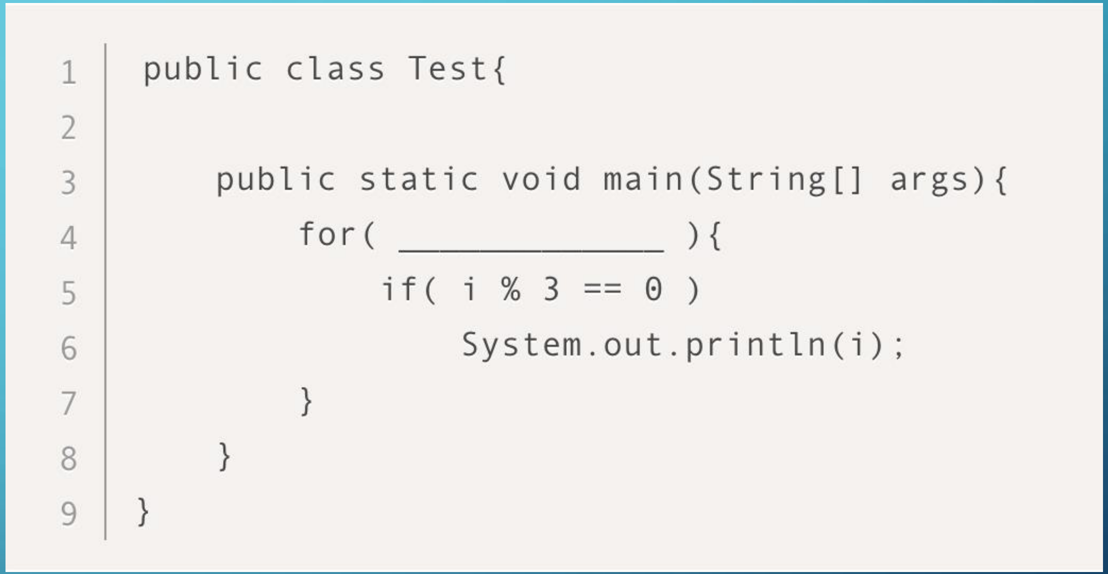
Option D is correct choice. For loop goes from 0 to 4 but the value of variable i is incremented in the loop body as well. So for each iteration variable i is incremented by 2. Code will print 0, 2 and 4 in respective iterations before the condition becomes false (i = 6 which makes i < 5 condition false).

WHAT WILL YOU WRITE INSIDE THE FOR LOOP TO MAKE THE CODE PRINT NUMBERS DIVISIBLE BY 3 BETWEEN 1 AND 10 (BOTH INCLUSIVE)?

A. int i = 0; i < 10; i++

B. int i = 1; i <= 10; i++

C. int i = 0; i <= 9; i++



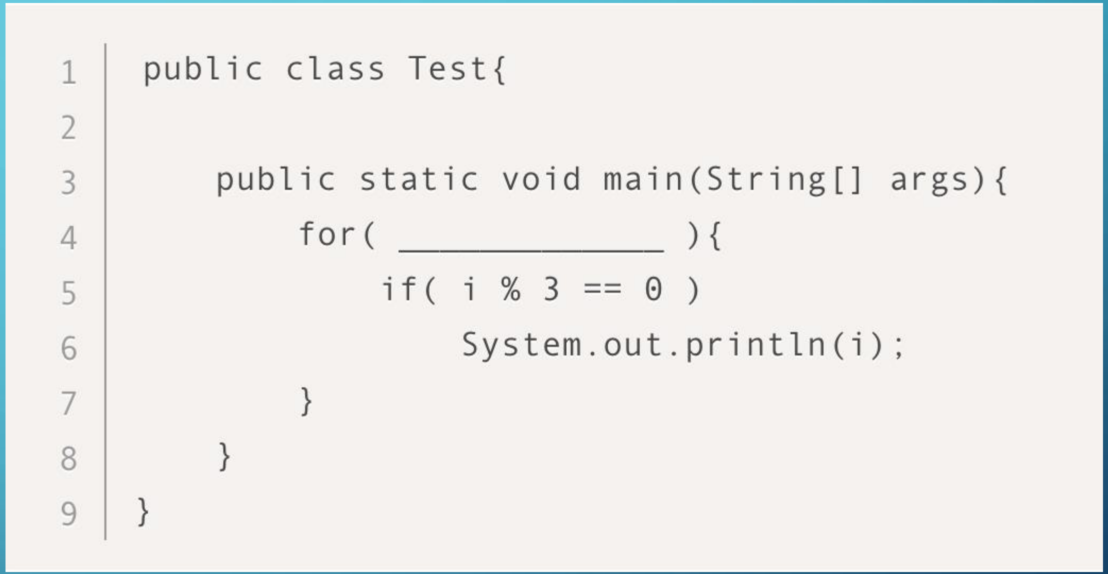
```
public class Test{

    public static void main(String[] args){
        for( ______________ ){
            if( i % 3 == 0 )
                System.out.println(i);
        }
    }
}
```

WHAT WILL YOU WRITE INSIDE THE FOR LOOP TO MAKE THE CODE PRINT NUMBERS DIVISIBLE BY 3 BETWEEN 1 AND 10 (BOTH INCLUSIVE)?

A. int i = 0; i < 10; i++

B. int i = 1; i <= 10; i++

C. int i = 0; i <= 9; i++



```
public class Test{

    public static void main(String[] args){
        for( ______________ ){
            if( i % 3 == 0 )
                System.out.println(i);
        }
    }
}
```

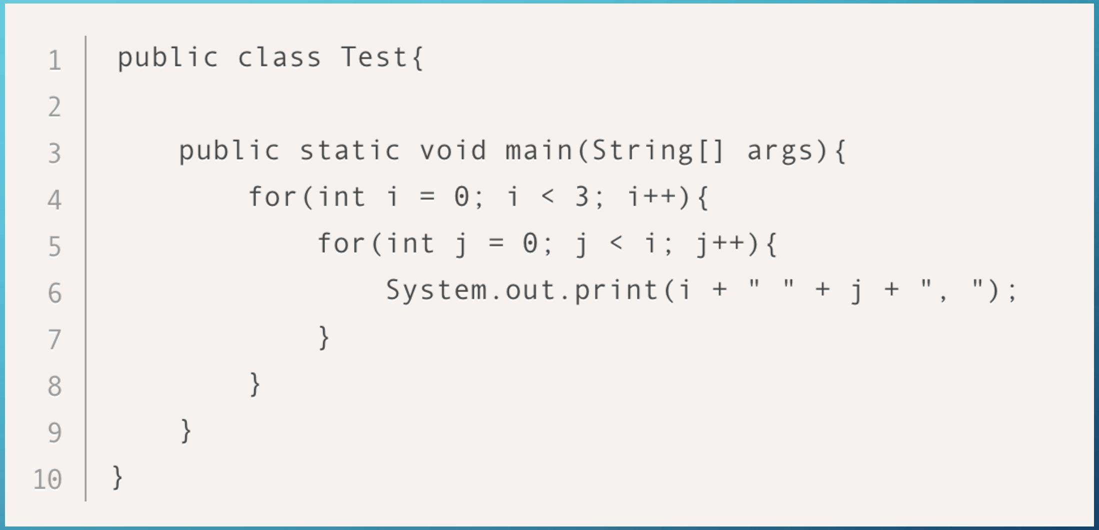
Option 2 is correct choice. First option starts with 0 and goes up to 9 only. Third option is also same, starting from 0 to 9.

WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. 0 0, 0 1, 0 2, 1 0, 1 1, 1 2, 2 0, 2 1, 2 2,

B. 0 0, 0 1, 0 2, 0 3, 1 0, 1 1, 1 2, 1 3, 2 0, 2 1, 2 2, 2 3,

C. 1 0, 2 0, 2 1,



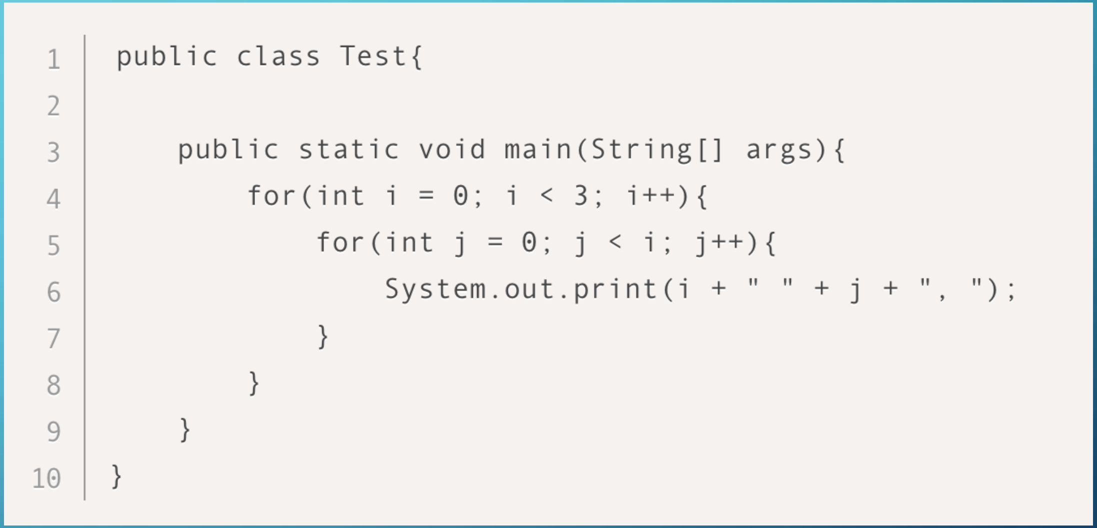
```java
public class Test{

    public static void main(String[] args){
        for(int i = 0; i < 3; i++){
            for(int j = 0; j < i; j++){
                System.out.print(i + " " + j + ", ");
            }
        }
    }
}
```

WHAT WILL HAPPEN WHEN YOU RUN THE FOLLOWING CODE?

A. 0 0, 0 1, 0 2, 1 0, 1 1, 1 2, 2 0, 2 1, 2 2,

B. 0 0, 0 1, 0 2, 0 3, 1 0, 1 1, 1 2, 1 3, 2 0, 2 1, 2 2, 2 3,

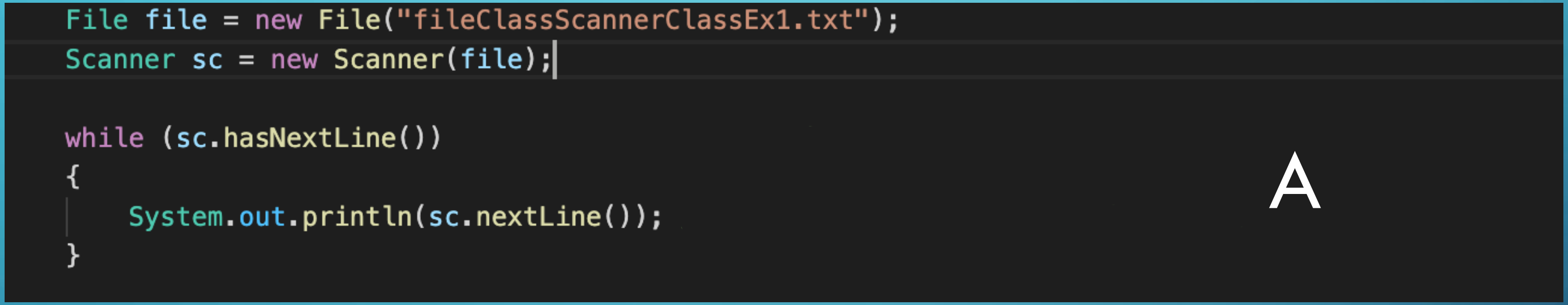
C. 1 0, 2 0, 2 1,



```java
public class Test{

    public static void main(String[] args){
        for(int i = 0; i < 3; i++){
            for(int j = 0; j < i; j++){
                System.out.print(i + " " + j + ", ");
            }
        }
    }
}
```

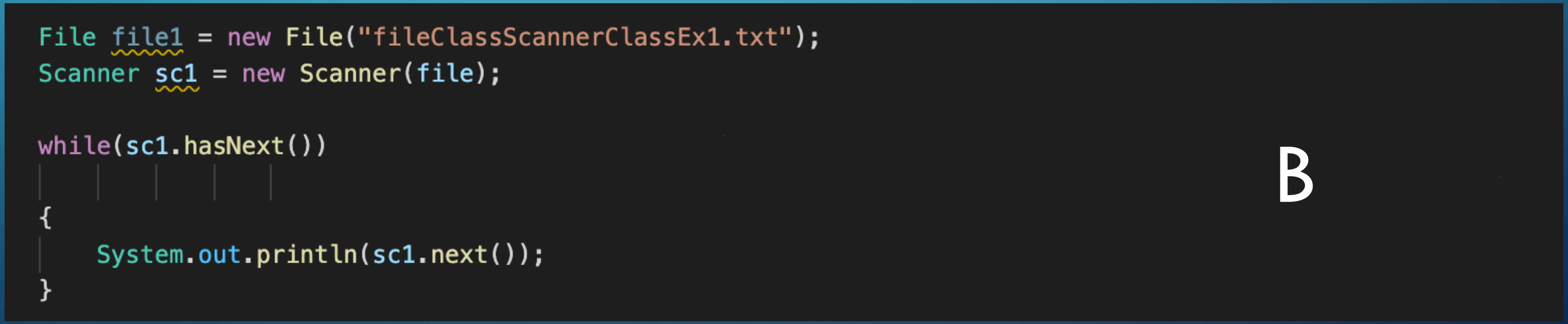
Option 3 is correct choice. Condition of inner for loop is j < i so in the first iteration of the outer loop, there will not be any iteration of the inner for loop (because of 0 is not less than 0). In the second iteration of the outer for loop, value of variable i is 1 so there will be one iteration of the inner loop which will print 1 and 0 for i and j respectively. In the third iteration i becomes 2, so the inner loop will have two iterations and will print 2 0 and 2 1 respectively.

GIVEN A TEXT FILE, WHICH OF THE FOLLOWING PRINTS OUT EACH WHOLE LINE ONE AT A TIME?



```java
File file = new File("fileClassScannerClassEx1.txt");
Scanner sc = new Scanner(file);

while (sc.hasNextLine())
{
    System.out.println(sc.nextLine());
}
```

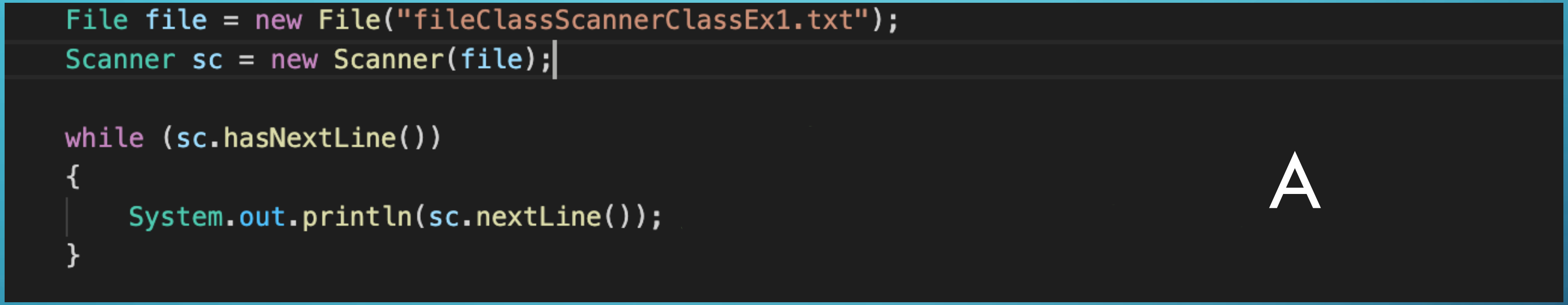
A



```java
File file1 = new File("fileClassScannerClassEx1.txt");
Scanner sc1 = new Scanner(file);

while(sc1.hasNext())

{
    System.out.println(sc1.next());
}
```

B

GIVEN A TEXT FILE, WHICH OF THE FOLLOWING PRINTS OUT EACH WHOLE LINE ONE AT A TIME?



```
File file = new File("fileClassScannerClassEx1.txt");
Scanner sc = new Scanner(file);

while (sc.hasNextLine())
{
    System.out.println(sc.nextLine());
}
```

A

A is correct because b would've printed out each "token" (individual word in this case) one at a time.

WHICH OF THE FOLLOWING STATEMENTS OPENS A FILE NAMED MYFILE.TXT AND ALLOWS YOU TO APPEND DATA TO ITS EXISTING CONTENTS?

A. PrintWriter outfile = new PrintWriter("MyFile.txt", true);

B. PrintWriter outfile = new PrintWriter(true, "MyFile.txt");

C. FileWriter fwriter = new FileWriter("MyFile.txt", true);
   PrintWriter outFile = new PrintWriter(fwriter);

D. FileWriter fwriter = new FileWriter("MyFile.txt");
   PrintWriter outFile = new PrintWriter(fwriter);

WHICH OF THE FOLLOWING STATEMENTS OPENS A FILE NAMED MYFILE.TXT AND ALLOWS YOU TO APPEND DATA TO ITS EXISTING CONTENTS?

A. `PrintWriter outfile = new PrintWriter("MyFile.txt", true);`

B. `PrintWriter outfile = new PrintWriter(true, "MyFile.txt");`

C. `FileWriter fwriter = new FileWriter("MyFile.txt", true);`
`PrintWriter outFile = new PrintWriter(fwriter);`

D. `FileWriter fwriter = new FileWriter("MyFile.txt");`
`PrintWriter outFile = new PrintWriter(fwriter);`

C is correct because A & B don't use a FileWriter object. D doesn't add the true Boolean value to append the data which means the file would be overwritten.

WHAT IS OUTPUT TO THE TERMINAL WHEN YOU RUN THE FOLLOWING CODE?

A. This program writes "a" to the standard output.

B. This program writes "ab" to the standard output.

C. This program writes "acd" to the standard output.

D. This program writes "ac" to the standard output.

E. This program writes "ad" to the standard output.

F. This program writes "b" to the standard output.

```java
public class MyException
{
  public static void main(String[] args)
  {
    int x = 0;
    int y = 4;
    try
    {
      System.out.print("a");
      y = y / x;
      System.out.print("b");
    }
    catch (ArithmeticException ae)
    {
      System.out.print("c");
    }
    finally
    {
      System.out.print("d");
    }
  }
}
```

WHAT IS OUTPUT TO THE TERMINAL WHEN YOU RUN THE FOLLOWING CODE?

A. This program writes "a" to the standard output.

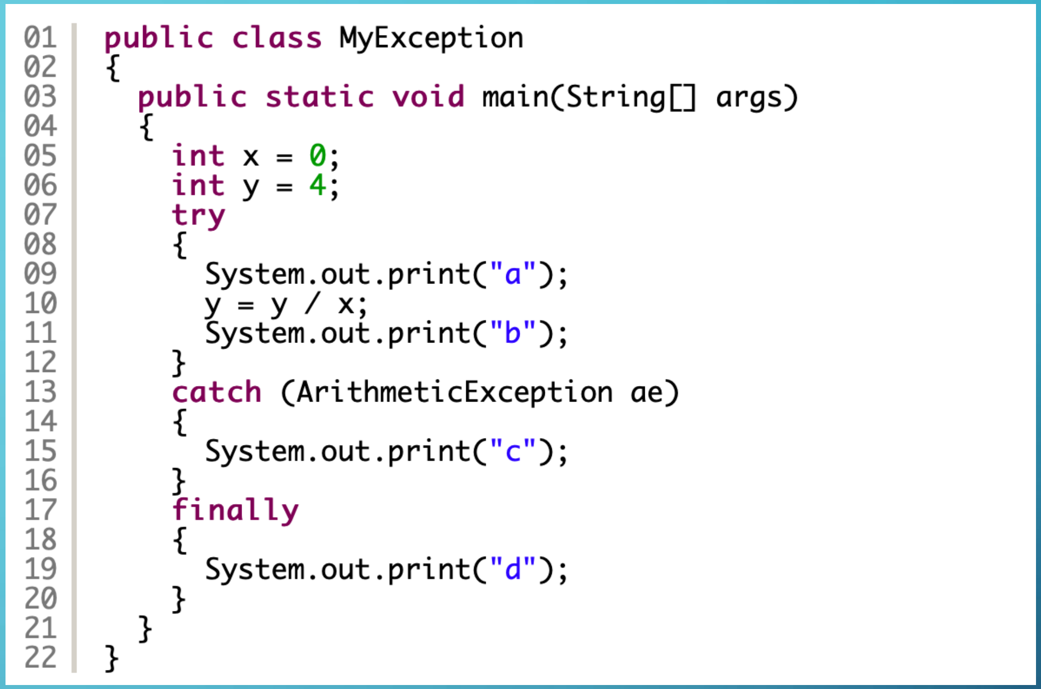
B. This program writes "ab" to the standard output.

C. This program writes "acd" to the standard output.

D. This program writes "ac" to the standard output.

E. This program writes "ad" to the standard output.

F. This program writes "b" to the standard output.



```java
public class MyException
{
  public static void main(String[] args)
  {
    int x = 0;
    int y = 4;
    try
    {
      System.out.print("a");
      y = y / x;
      System.out.print("b");
    }
    catch (ArithmeticException ae)
    {
      System.out.print("c");
    }
    finally
    {
      System.out.print("d");
    }
  }
}
```

Here, an arithmetic exception occurs, because the statement y = y/x; divides y by 0. In the try block the first statement writes the letter “a” to the terminal, but the statement y = y/x; causes an arithmetic exception. Therefore, the rest of the try block will be ignored.

The type of the exception is an arithmetic exception. Therefore, the *catch* block is executed and the statement System.out.print(“c”); writes the letter “c” to the terminal.

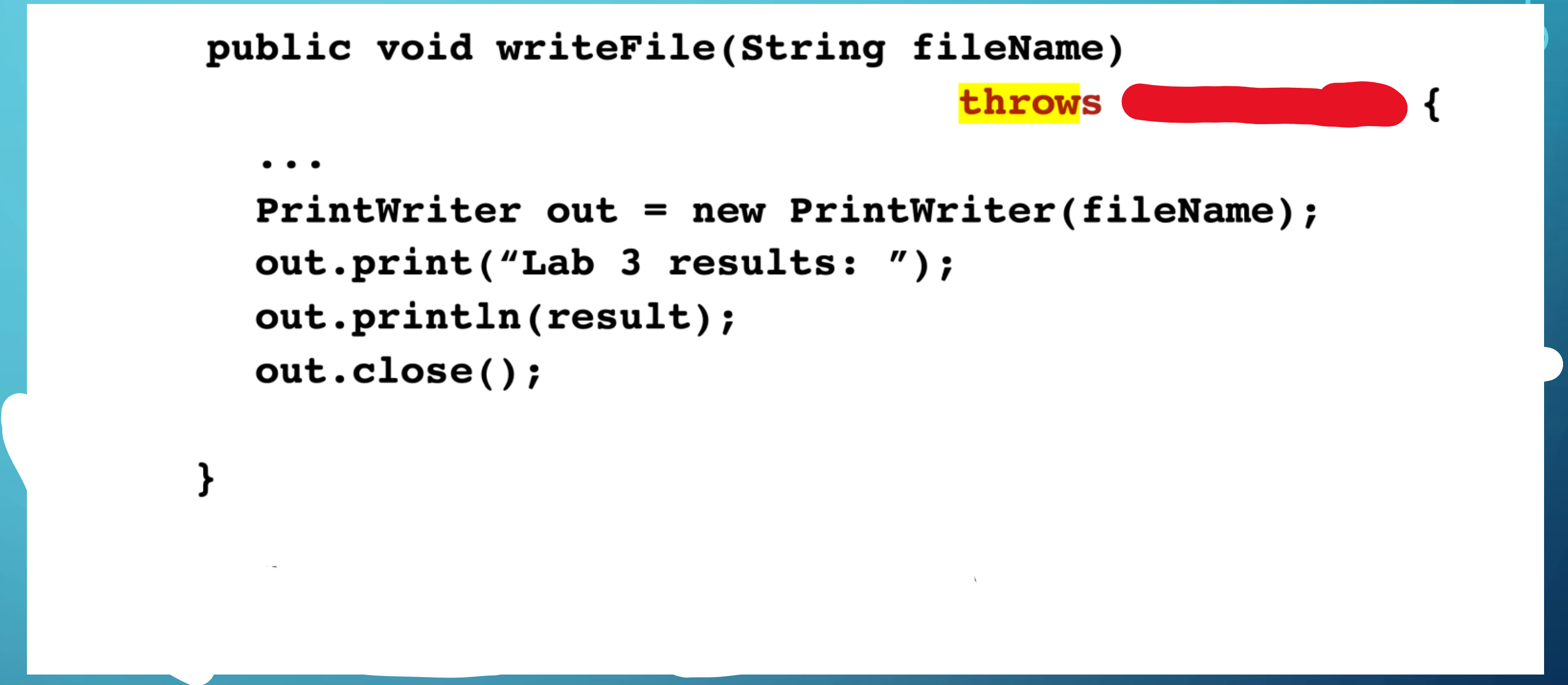
The *finally* block is always executed. Therefore, the statement System.out.print(“d”); writes the letter “d” to the standard output. So, the correct answer is option c

WHAT EXCEPTION NEEDS TO BE THROWN AT THE BEGINNING OF THIS METHOD TO HANDLE WHAT PRINTWRITER MIGHT THROW?

A. IOException

B. FileNotFoundException

C. NullPointerException



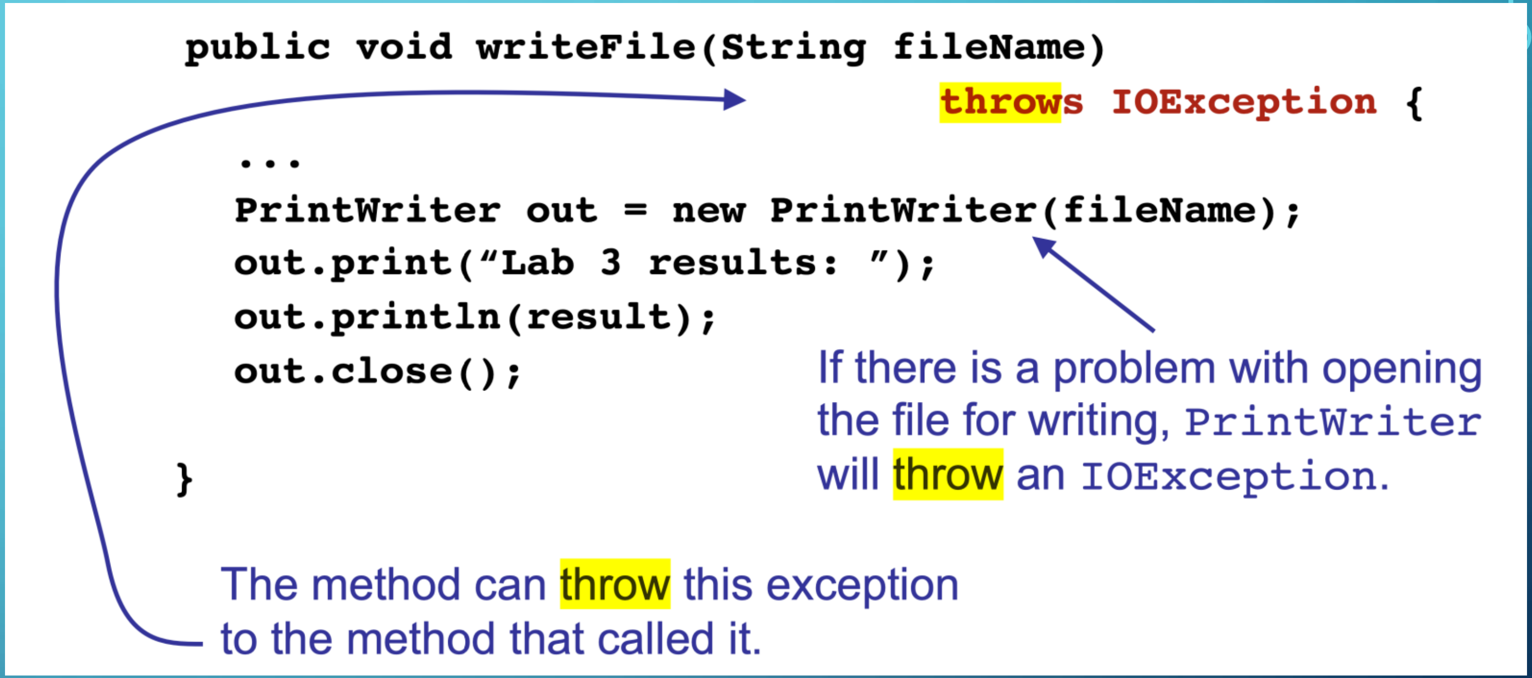
```
public void writeFile(String fileName)
                                        throws [redacted] {
    ...
    PrintWriter out = new PrintWriter(fileName);
    out.print("Lab 3 results: ");
    out.println(result);
    out.close();

}
```

WHAT EXCEPTION NEEDS TO BE THROWN AT THE BEGINNING OF THIS METHOD TO HANDLE WHAT PRINTWRITER MIGHT THROW?

A. IOException

B. FileNotFoundException

C. NullPointerException



```
public void writeFile(String fileName)
                              throws IOException {
  ...
  PrintWriter out = new PrintWriter(fileName);
  out.print("Lab 3 results: ");
  out.println(result);
  out.close();

}
```

If there is a problem with opening the file for writing, PrintWriter will throw an IOException.

The method can throw this exception to the method that called it.

WHICH OF THE FOLLOWING DECLARES AN ARRAY OF INTEGERS NAMED NUMBER?

A. int number ;

B. int [ ] number ;

C. int new number [ ] ;

D. int number = int [ ] ;

WHICH OF THE FOLLOWING DECLARES AN ARRAY OF INTEGERS NAMED NUMBER?

A. int number ;

B. int [ ] number ;

C. int new number [ ] ;

D. int number = int [ ] ;

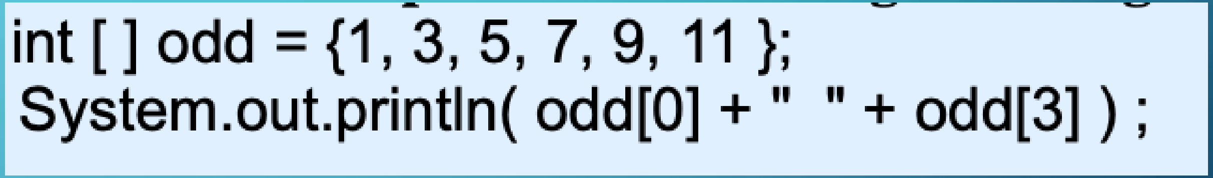
WHAT IS THE OUTPUT OF THE CODE FRAGMENT?

A. 1 5

B. 6

C. 1 7

D. 8



```
int [ ] odd = {1, 3, 5, 7, 9, 11 };
 System.out.println( odd[0] + "  " + odd[3] ) ;
```

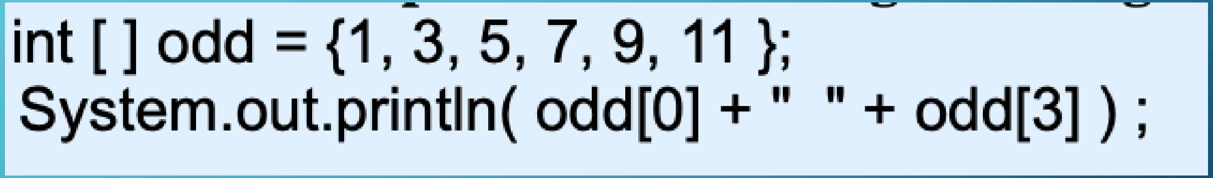
WHAT IS THE OUTPUT OF THE CODE FRAGMENT?

A. 1 5

B. 6

[✓ C. 1 7]

D. 8



```
int [ ] odd = {1, 3, 5, 7, 9, 11 };
 System.out.println( odd[0] + "  " + odd[3] ) ;
```

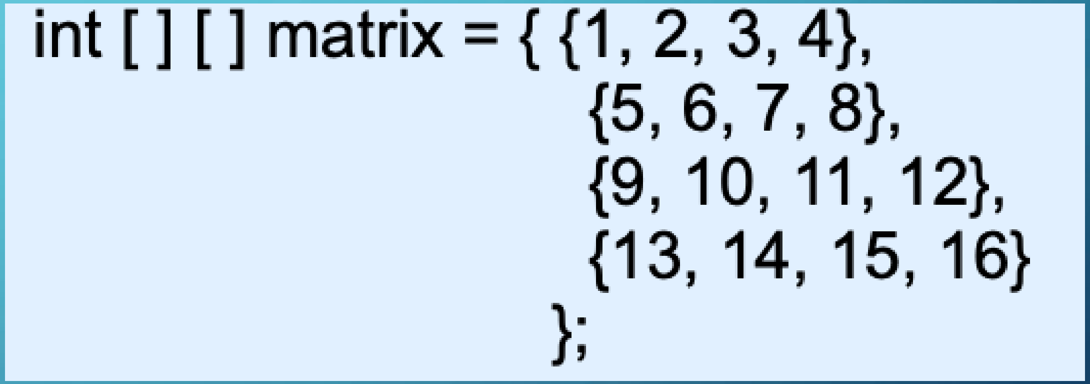
WHAT IS THE INDEX OF 12

A. matrix[3][4]

B. matrix[11]

C. matrix[2][3]

D. Matrix[2][4]



```
int [ ] [ ] matrix = { {1, 2, 3, 4},
                       {5, 6, 7, 8},
                       {9, 10, 11, 12},
                       {13, 14, 15, 16}
                     };
```

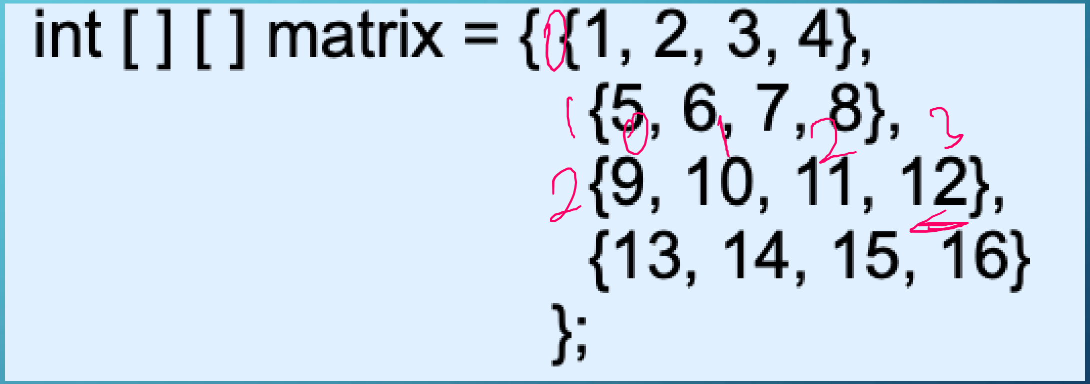
WHAT IS THE INDEX OF 12

A. matrix[3][4]

B. matrix[11]

C. matrix[2][3]

D. Matrix[2][4]



```
int [ ] [ ] matrix = {0{1, 2, 3, 4},
                      1 {5, 6, 7, 8},
                           0   1   2    3
                      2{9, 10, 11, 12},
                        {13, 14, 15, 16}
                     };
```

WHAT ELEMENT WILL BE AT INDEX 2 OF THE LIST?

A. Eve

B. Andy

C. Bart

D. Carl

```
ArrayList<String> list = new ArrayList<String>(10) ;

list.add( "Andy" );
list.add( "Bart" );
list.add( "Carl" );
list.add( 0, "Eve" );
```

What is the capacity of the list? How about the size?

A. 4, 4

B. 4, 10

C. 10, 4

D. 10, 10

WHAT ELEMENT WILL BE AT INDEX 2 OF THE LIST?

A. Eve

B. Andy

C. Bart

D. Carl

What is the capacity of the list? How about the size?

A. 4, 4

B. 4, 10

C. 10, 4

D. 10, 10

```
ArrayList<String> list = new ArrayList<String>(10) ;

list.add( "Andy" );
list.add( "Bart" );
list.add( "Carl" );
list.add( 0, "Eve" );
```

When we add “Andy”, Andy is at index 0
When we add “Bart”, Andy is at index 0 and Bart is at index 1
When we add “Carl”, Andy is at index 0, Bart is at index 1, and Carl is at index 2
We add Eve to the 0th index, so everyone else shifts down so Andy is at 1, Bart is at 2, and Carl is at 3

Capacity is how many items the list can hold (in this case, ten items) and size is how many elements are in the list (in this case, four items)

QUESTIONS?

WHAT CONCEPTS WOULD YOU LIKE TO KNOW MORE ABOUT?

FOR NEXT WEEK

- If you have an exam, good luck! That'll mean no recitation again if it's on Wednesday.
- If the exam isn't Wednesday then we'll go over this stuff again.
- **Please email me or if you're having issues with submitting labs on time**
  - **Or if you're having any issues with the labs/quizzes! If you don't understand how to do something just ask!**
- **Lab 6 is now due 10/27 && Lab 7 is due 10/30**
- As always, here's the Discord link: https://discord.gg/W5PeVfw7
  - Joining is optional, but it'll be a good point of contact with us