

# QUIZ 1A: INTRODUCTION

1 1 / 1 point

Algorithms must be all of the following except:

- concise
- precise
- logical
- ambiguous

2 1 / 1 point

A set of logically sequenced instructions that allows to find the solution to a problem is:

- Program
- Pseudocode
- Compiler
- Algorithm

5 1 / 1 point

A set of instructions that tells the computer how to behave, what to do and derive at a solution to a particular problem is:

- Pseudocode
- Program
- Compiler
- Algorithm

6 1 / 1 point

A system program that brings together separately compiled modules of a program into a form language that is suitable for execution

- linker/loader
- none of the above
- compiler
- assembler

7 1 / 1 point

Size of an int in Java is

- 16 bit
- depends on the execution environment
- 32 bit

11 1 / 1 point

Output of a Java compiler is executable code

- True

- False

3 1 / 1 point

Order the following steps of program development in logical order (first goes to the top etc.)

- define
- analyze
- develop
- write
- test
- debug
- document

4 1 / 1 point

How is the module that converts assembly language into machine language called?

- Debugger
- Programmer
- Compiler
- Assembler

8 1 / 1 point

What is byte code in Java?

- name of a Java source code file
- block of code written in a Java program
- code generated by a Java compiler
- code generated by a Java Virtual Machine (JVM)

9 1 / 1 point

Basic data types in Java are:

- 4
- 32
- 8
- 16

10 1 / 1 point

We can run the same java program on different environment (Operating System) with same JVM Version.

- True

- False

## QUIZ 1B: EXPRESSION EVALUATION

1 11/11 points

12 / 5 + 8 / 4	✓	4	3 * 4 + 15 / 2	✓	19	-(1 + 2 * 3 + (1 + 2) * 3)	✓	-16	42 % 5 +
16 % 3	✓	3	2.5 * 2 + 17 / 4	✓	9.0	4.5 / 3 / 2 + 1	✓	1.75	2 + 6 + "Jerry"
✓	8	Jerry	✓	Jerry26	1 + 9 / 2 * 2.0	✓	9.0	46 / 3 / 2.0 / 3 *	
4/5	✓	2.0	50 / 9 / 2.0 + 200 / 10 / (5.0 / 2)	✓	10.5				

## QUIZ 2: VARIABLES AND METHODS

3 1/1 point

1 1/1 point

Which of these operators has the highest precedence?

- ++
- \*
- 
- <

Suppose you have a variable named `grade`, set to `1.6`:

```
double grade = 1.6; // uh-oh
```

Suppose later in the program's code, we want to change the value of `grade` to `4.0`. Which is the correct syntax to do this?

- `set grade = 4.0;`
- `double grade = 4.0;`
- `4.0 = grade;`

`grade = 4.0;`

2 1/1 point

Which of the following choices is the correct syntax for declaring a real number variable named `grade` and initializing its value to `4.0`?

- `4.0 = grade;`
- `int grade = 4.0;`
- `double grade = 4.0;`
- `grade = 4.0;`
- `grade = double 4.0;`

4 1/1 point

What is the type of the expression `&`?

- Integer
- Float
- Boolean

5 1/1 point

Determine the output of the following program

```
1 public class Test {  
2     public static void main(String[] args) {  
3         test(99.9);  
4     }  
5     public static void test(float x) {  
6         System.out.println("float");  
7     }  
8     public static void test(double x) {  
9         System.out.println("double");  
10    }  
11 }  
12  
13 }
```

float

double

compiler (syntax) error

runtime error

6 1/1 point

Modulus operator (%) can be applied to which of these?

- Integers
- Floating-point (real) numbers
- Both of the above
- None of these

7 1/1 point

What is the output of the following code?

```
boolean var1 = true;  
boolean var2 = false;  
System.out.println((var1 && var2));
```

- 0
- 1
- true

false

9 3/3 points

What are the values of `a`, `b` and `c` after the following statements are executed in this specific order?

**Hint:** Try to "draw" a sketch of the memory and you will realize how this helps avoiding mistakes.

```
int a = 5;  
int b = 10;  
int c = b;  
  
a = a + 1;  
b = b - 1;  
c = c + a;
```

a is 6, b is 9, c is 16

11 1/1 point

What will be the output of the following Java statements?

```
int a = 1;  
int b = 2;  
int c;  
int d;  
c = ++b;  
d = a++;  
c++;  
b++;  
++a;  
  
System.out.println(a + " " + b + " " + c);
```

2 3 4

3 2 3

3 2 4

3 4 4

10 1/1 point

What is the output of the following code?

```
1 public class Quizz {  
2     public static void main(String[] args) {  
3         int i=8;  
4         int j=9;  
5         add();  
6     }  
7     public static void add() {  
8         int k=i-j;  
9         System.out.println(k);  
10    }  
11 }  
12  
13 }
```

17

0

Compilation fails with an error at line 5

Compilation fails with an error at line 9

None of these

12 3/3 points

What are the values of `i`, `j`, and `k` after the following statements?

```
int i = 2;  
int j = 3;  
int k = 4;  
int x = i + j + k;  
  
i = x - i - j;  
j = x - j - k;  
k = x - i - k;
```

i is 4, j is 2, k is 1

13 4 / 4 points

In the following program, method sentence is called twice, thus we expect four values to be printed. What is the exact output of the program?

```
public class MysteryNums {
    public static void main(String[] args) {
        int x = 15;
        sentence(x, 42);      //  
  

        int y = x - 5;
        sentence(y, x + y);  //  

    }  
  

    public static void sentence(int num1, int num2) {
        System.out.print(num1 + " " + num2 + " ");
    }
}
```

15     42     10     25

Which variables are visible in which of the method(s) below? **On paper**, draw the memory space and clearly show when variables are created and cease to exist.

```
1 public class Example {  
2     public static void main(String[] args) {  
3         int x = 10;  
4         performTest(x);  
5     }  
6  
7     public static void performTest(int count) {  
8         int i=1;  
9         runSample(i);  
10        i=2;  
11        runSample(i);  
12        i=3;  
13        runSample(i);  
14        System.out.print(count);  
15    }  
16  
17    public static void runSample(int j) {  
18        System.out.println("sample "+ j);  
19    }  
20 }
```

x is visible in main

x is visible in performTest  
 x is visible in runSample  
 i is visible in main

i is visible in performTest

i is visible in runSample  
 count is visible in main

count is visible in performTest

count is visible in runSample  
 j is visible in main  
 j is visible in performTest

j is visible in runSample

14 1 / 1 point

Suppose you have a variable named balance, set to 463.23:

```
double balance = 463.23
```

Suppose later in the program's code, we want to add 5 to the account balance. Which is a correct statement to do this (more than one might be correct, select all that apply)?

- balance = 5;  
 balance = balance + 5;  
 balance = balance + 5.0;  
 5 + balance = balance;  
 balance + 5;  
 balance <-- balance + 5;  
 balance +=5;

16 1 / 1 point

What will be the output of the following statements?

```
double var1 = 1 + 5;  
double var2 = var1 / 4;  
int var3 = 1 + 5;  
int var4 = var3 / 4;  
System.out.print(var2 + " " + var4);
```

1.5 1

- 1.5 1.0  
 0 1  
 1 1

17 1 / 1 point

Which of the following automatic type conversions in Java is possible?

- long to int  
 int to byte  
 int to long  
 double to float

## QUIZ 3: CONDITIONALS

1 0.8 / 1 point

The if/else mystery. What is the output of the following program, if n = 40, n = 8, n = 0, n = 12, n = 20? Write down the expected result:

```
int n = ...;  
if (n > 10) { n = n / 2; }  
else { n = n + 7; }  
if (n * 2 < 25) { n = n + 10; }  
System.out.println(n);
```

n=40	<input checked="" type="checkbox"/> 20
n=8	<input checked="" type="checkbox"/> 15
n=0	<input checked="" type="checkbox"/> 24
Correct Answer: 17	
n=12	<input checked="" type="checkbox"/> 16
n=20	<input checked="" type="checkbox"/> 20

3 1 / 1 point

Which is the output received when executing the following piece of code?

```
int x = 2;  
int y = 0;  
  
if (x > y) {  
    System.out.print("x");  
} else if (x == 2) {  
    System.out.print("2");  
} else if (x > 5) {  
    System.out.print("y");  
} else {  
    System.out.print("None");  
}
```

- 2
- x
- x2
- None

### Feedback

#### General Feedback

The conditional execution of statements presented in this exercise (if-else if-else) establishes that, once a condition is met (it returns true), the rest of the conditional statement is not evaluated and therefore, not executed regardless of returning true or false.

5 0 / 1 point

Which is the output received when executing the following piece of code?

```
double x = 0.1*10;  
double y = 0.1+0.1+0.1+0.1+0.1+0.1+0.1+0.1+0.1+0.1;  
  
if (x == y)  
    System.out.print("Equal");  
else  
    System.out.print("Not equal");
```

- Equal
- Not equal

Correct Answer: Not equal

- Not equal
- The compiler will show an error since the curly brackets in the if-else statements are missing

### Feedback

#### General Feedback

Be careful with the floating-point comparisons! The precision of each operation may lead to slightly different results (e.g. 0.9999999999 != 1.0). Revise the relevant slides in Lecture 3 for further details and the proper way to compare them.

2 1.818 / 2 points

(On paper) In this exercise, you will practice how to apply string manipulation using methods already developed for this purpose. Refer to String API (see Java API) and be sure to understand how each method is applied (what do I need to provide as parameters) and what is the result (is it a new string? an integer? a Boolean?) NOTE: do NOT use the compiler.

```
String str1 = "Frodo Baggins";  
String str2 = "Gandalf the GRAY";  
  
str1.length();  13  
  
str1.charAt(7);  a  
  
str2.charAt(0);  G  
  
str1.indexOf("o");  2  
  
str2.toUpperCase();  GANDALF THR GRAY  
Correct Answer: GANDALF THE GRAY  
  
str1.toLowerCase().indexOf("B");  -1  
  
str1.substring(4);  o Baggins  
  
str2.substring(3, 14);  dalf the GR  
  
str2.replace("a", "oo");  Goondoolf the GRAY  
  
str2.replace("gray", "white");  Gandalf the GRAY  
  
"str1".replace("r", "range");  strange1
```

4 1 / 1 point

Which is the output received when executing the following piece of code?

```
int x = 2;  
int y = 0;  
  
if (x > y) {  
    System.out.print("x");  
} if (x == 2) {  
    System.out.print("2");  
} else if (x > 5) {  
    System.out.print("y");  
} else {  
    System.out.print("None");  
}
```

- y
- x
- None

- x2

### Feedback

#### General Feedback

In this case, the control flow uses independent if statements and therefore, all of them are evaluated

6

1 / 1 point

Which is the output received when executing the following piece of code?

```
String s1 = "cs1";
String s2 = "CS1";
s1 = s1.toUpperCase();
if (s1 == s2)
    System.out.print("Equal");
else
    System.out.print("Not equal");
```

None of them

Not equal

Equal

### Feedback

#### General Feedback

If you compare two Strings (or any other object in Java) using `==` you are comparing their addresses (positions in the memory). To compare equality of two strings' the content, use the method "equals" instead.

7

1 / 1 point

Which is the output received when executing the following piece of code?

```
int a = 10;
switch (a) {
    case 0: System.out.print("0");
    case 10: System.out.print("10");
    case 20: System.out.print("20");
    case 30: System.out.print("30");
}
```

0

10

None of them

102030

### Feedback

#### General Feedback

If you want to execute the code in just the relevant "case", do not forget the use of "break"

## QUIZ 4: LOOPS

1 1 / 1 point

Choose the correct answer in the context of the following program.

```
public class Test {  
    public static void main(String[] args) {  
  
        double sum=0.0;  
  
        for(double d=0;d<10){  
            d+=0.1;  
            sum+=sum+d;  
        }  
    }  
}
```

- The program has a compile error because the control variable in the for loop cannot be of the double type.
- The program has a compile error because the change/adjustment statement is missing in the for loop.
- The program runs in an infinite loop because d<10 would always be true and there is no change/adjustment statement.

The program compiles and runs fine.

4 1 / 1 point

What does the following code print?

```
for (int i = 3; i <= 12; i++)  
{  
    System.out.print(i + " ");  
}
```

4 5 6 7 8 9 10 11 12

3 5 7 9 11

3 4 5 6 7 8 9 10 11 12

5 6 7 8 9

### Feedback

#### Based on your answer

The value of i starts at 3 and this loop will execute until i equals 12. The last time through the loop the value of i is 12 at the beginning and then it will be incremented to 13 which stops the loop since 13 is not less than or equal to 12.

7 0 / 1 point

What will be the output of the following Java program?

```
int sum = 0;  
  
for (int i = 0, j = 0; i < 5 & j < 5; ++i, j = i + 1) {  
    sum += i;  
}  
  
System.out.println(sum);
```

14

5

Correct Answer: 6

compiler error

6

### Feedback

#### Based on answering incorrectly

Using comma operator, we can include more than one statement in the initialization and iteration portion of the for loop. Therefore both ++i and j = i + 1 is executed i gets the value - 0,1,2,3,4 & j gets the values -0,1,2,3,4,5.

2 1 / 1 point

Which of the following loops is an infinite loop?

- for (;;) { }
- for (i=0; i++;) { }
- None of the mentioned
- for (i=0; i<1; i--) { }

3 1 / 1 point

How many times does the following method print a \*?

```
for (int i = 3; i < 9; i++)  
{  
    System.out.print("*");  
}
```

6

7

10

9

### Feedback

#### Based on your answer

Since i starts at 3 and the last time through the loop it is 8 the loop executes 8 - 3 + 1 times = 6 times.

5 1 / 1 point

How many times does the following method print a \*?

```
for (int i = 0; i <= 8; i++)  
{  
    System.out.print("*");  
}
```

8

7

9

### Feedback

#### Based on your answer

This loop starts with i = 0 and continues till it reaches 9 so (9 - 0 = 9).

6 1 / 1 point

Which of the following loops will execute the body of loop even when condition controlling the loop is initially false?

- for
- do-while
- while
- none of the mentioned

8 1 / 1 point

How many stars are output when the following code is executed?

```
for (int i = 0; i < 5; i++) {  
    for (int j = 0; j < 5; j++) {  
        System.out.println("*");  
    }  
}
```

15

50

25

5

10

### Feedback

#### Based on answering correctly

The first loop will execute 5 times, and for each time through, the second loop will execute 5 times. So the answer is the number of times through the first loop times the number of times through the second.

10 1/2 points

What are the values of x and y after the end of the loop?

```
int a, x=0, y=0;
while (x<10) {
    a=x*2;
    y+=a;
    x++;
}
```

x=  , y=

Correct Answer: 10

11 1/1 point

Which of the following loop bodies DOES compute the product from 1 to 10 (i.e.,  $1 * 2 * 3 * 4 * 5 * 6 * 7 * 8 * 9 * 10$ )?

```
int s = 1;
for (int i = 1; i <= 10; i++) {
    <what to put here?>
}
```

- s = s + s \* i;
- s += i \* i;
- s++;

s \*= i;

13 0/1 point

Which of the following code segments will produce the displayed output?

```
1
22
333
4444
55555
```

```
for (int i = 1; i < 5; i++) {
    for (int j = i; j > 0; j--) {
        System.out.print(i);
    }
    System.out.println();
}
```

```
for (int i = 1; i <= 5; i++) {
    for (int j = i; j > 0; j--) {
        System.out.print(i);
    }
    System.out.println();
}
```

```
for (int i = 1; i < 6; i++) {
    for (int j = 0; j < i; j++) {
        System.out.println(i);
    }
}
```

```
for (int i = 0; i < 5; i++) {
    for (int j = 0; j < i; j++) {
        System.out.print(i+1);
    }
    System.out.println();
}
```

```
for (int i = 0; i < 5; i++) {
    for (int j = 0; j < i; j++) {
        System.out.print(i);
    }
    System.out.println();
}
```

Correct Answer:

```
for (int i = 1; i <= 5; i++) {
    for (int j = i; j > 0; j--) {
        System.out.print(i);
    }
    System.out.println();
}
```

## Feedback

### Based on your answer

This will loop i from 0 to 4 and j from 0 to i, neglecting to output 5.

12 0/1 point

What are the values of var1 and var2 after the following code segment is executed and the while loop finishes?

```
int var1 = 0;
int var2 = 2;

while ((var2 != 0) && ((var1 / var2) >= 0)) {
    var1 = var1 + 1;
    var2 = var2 - 1;
}
```

- var1=0, var2=2
- var1=1, var2=1
- var1=3, var2=-1
- var1=2, var2=0

The loop won't finish executing because of a division with 0 (runtime error)

Correct Answer: var1=2, var2=0

## Feedback

### Based on answering incorrectly

The loop starts with var1=0 and var2=2. The while checks that var2 isn't 0 and that var1/var2 is greater than or equal to zero ( $0/2=0$ ) so this is equal to zero and the body of the while loop will execute. The variable var1 has 1 added to it for a new value of 1. The variable var2 has 1 subtracted from it for a value of 1. At this point var1=1 and var2=1. The while condition is checked again. Since var2 isn't 0 and var1/var2 ( $1/1=1$ ) is  $>=0$  so the body of the loop will execute a second time. The variable var1 has 1 added to it for a new value of 2. The variable var2 has 1 subtracted from it for a value of 0. At this point var1=2 and var2=0. The while condition is checked again. Since var2 is zero the while loop stops and the value of var1 is 2 and var2 is 0.

## QUIZ 5: ARRAYS

1 8/8 points

Fill in the array values that would be stored after the code below executes.

```
int[] data = new int[8];
data[0] = 3;
data[7] = -18;
data[4] = 5;

data[1] = data[0];
int x = data[4];
data[4] = 6;
data[x] = data[0] * data[1];
```

There are 8 boxes, each for one position of the array in order.

<input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> 0	<input checked="" type="checkbox"/> 0	<input checked="" type="checkbox"/> 6	<input checked="" type="checkbox"/> 9	<input checked="" type="checkbox"/> 0	
<input checked="" type="checkbox"/> -18							

3 6/6 points

Suppose we have the following program. What are the contents of array a5 after the execution of mystery method?

```
public class ILoveArrays {
    public static void main(String[] args) {
        int[] a5 = {2,4,6,3,7,9};
        mystery(a5);
    }

    public static void mystery(int[] a) {
        for (int i = 0; i < a.length - 1; i++) {
            if (a[i] < a[i + 1])
                a[i] = a[i + 1];
        }
    }
}
```

There are 6 boxes, each for one position of the array in order.

<input checked="" type="checkbox"/> 4	<input checked="" type="checkbox"/> 6	<input checked="" type="checkbox"/> 6	<input checked="" type="checkbox"/> 7	<input checked="" type="checkbox"/> 9	<input checked="" type="checkbox"/> 9

5 1/1 point

What is the output of the following piece of code?

```
int[] array = { 1, 4, 3, 6, 8, 2, 5 };
int what = array[0];

// scan the array
for (int i=0; i < array.length; i++ )
{
    if ( array[i] > what )
        what = array[i];
}
System.out.println(what);
```

- 1
- 1436825
- 8

- The compiler will show an error
- 5

6 1/1 point

Which index gives us the last element in an array called nums?

- both of the above
- nums.length-1
- none of the above
- nums.length

2 2/6 points

Fill in the array with values that would be stored after the code executes.

```
int[] list = {2, 18, 6, -4, 5, 1};
for (int i = 0; i < list.length; i++) {
    list[i] = list[i] + (list[i] / list[0]);
}
```

There are 6 boxes, each for one position of the array in order.

<input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> 27	<input checked="" type="checkbox"/> 9	<input checked="" type="checkbox"/> -6	<input checked="" type="checkbox"/> 7	
Correct Answer: 24	Correct Answer: 8	Correct Answer: -5	Correct Answer: 6		
<input checked="" type="checkbox"/> 1					

4 1/1 point

What is the output of the following piece of code?

```
int[] myArray = {2, 4, 6, 8, 10, 1, 3, 5, 7, 9};
for (int index=0; index < 4; index++)
    System.out.print(myArray[index] + " ");
```

- 2468101
- 246
- 246810
- 2468

6 1/1 point

Which index gives us the last element in an array called nums?

- both of the above
- nums.length-1
- none of the above
- nums.length

7 1/1 point

Which of the following will cause a syntax error?

- int[] nums = null;
- int[] nums = {1,2,3,4,5};
- String[] names = new String[10];
- String[] names = {2,3,5}
- int[] nums = new int[3];

# QUIZ 6: RECURSION

1 1/1 point

Recursion uses...

repetition statements (for/while/do)

selection statements (if/else if/ switch)

2 0.667 / 1 point

Which of the following statements are true?

A recursive method can always be replaced by a non-recursive method.

Recursive methods usually take more memory space than non-recursive methods.

Missed option - incorrect

Recursive methods run faster than non-recursive methods.

In some cases, using recursion enables you to give a natural, straightforward, simple solution to a program that would otherwise be difficult to solve.

5 1/1 point

How many activations will there be on the activation chain (number of times the method square is called) if main() calls square(5)?

```
public static int square(int n) {  
    if (n==1)  
        return 1;  
    else  
        return square(n-1) + 2*n - 1;  
}
```

5

6 1/1 point

Taking into account the previous implementation of the method square, what is the output of the following piece of code?

```
class Main {  
    public static void main(String[] args) {  
        System.out.println(square(5));  
    }  
}
```

25

3 1/1 point

Which of the following will happen if a recursive method does not have a base case?

After 1000000 calls it will be automatically stopped

None of them

An infinite loop

The program will stop after some time trying to find a solution

## Feedback

### General Feedback

If a recursive method does not have a base case then an infinite loop occurs which results in Stack Overflow.

4 0 / 1 point

Both iteration and recursion can loop infinitely if the termination test is never satisfied.

True

False

Correct Answer: True

7 1/1 point

What is the output of the following piece of code if main() calls mystery(4, 6)?

```
public static int mystery (int z, int n) {  
    if (n == z)  
        return z;  
    else if (n > z)  
        return mystery(z, n-z);  
    else  
        return mystery(z-n, n);  
}
```

Extra (not graded): Check this method with different input values and try to identify the operation it performs.

2

8 1/1 point

And what is the output when main() calls mystery\_v2(5, 3)?

```
public static int mystery_v2 (int z, int n) {  
    if (n == 1)  
        return z;  
    else  
        return z * mystery_v2(z, n-1);  
}
```

Extra (not graded): Check this method with different input values and try to identify the operation it performs.

125