CSE110: Principles of Programming
Assignment 3

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MULTIPLE CHOICE

1. The increment operator is:
   a. ++
   b. --
   c. *=
   d. -=

2. What will be the values of x and y as a result of the following code?

   ```
   int x = 25, y = 8; x
   += y++;
   ```

   a.   x = 25, y = 8
   b.   x = 33, y = 8
   c.   x = 33, y = 9
   d.   x = 34, y = 9

3. What will be the value of x after the following code is executed?

   ```
   int x, y = 4, z = 6; x
   = (y++) * (++z);
   ```

   a.   24
   b.   28
   c.   30
   d.   35

4. This is a control structure that causes a statement or group of statements to repeat.
   a.   Block
   b.   Loop
   c.   Prefix mode
   d.   Body

5. If a loop does not contain within itself a way to terminate, it is called a(n)
   a.   `while` loop
   b.   `do-while` loop
   c.   `for` loop
   d.   infinite loop

6. Each repetition of a loop is known as what?
    a. An iteration
    b. A cycle
    c. An execution
    d. A Lap

7. This variable controls the number of times that the loop iterates.
    a. Counter variable
    b. Loop control variable
    c. Running total
    d. Decrement variable

8. This type of loop will always be executed at least once.
    a. pre-test loop
    b. post-test loop
    c. sentinel loop
    d. `for` loop

9. If you are using a block of statements, don't forget to enclose all of the statements in a set of:
    a. Braces
    b. Double quotes
    c. Semicolons
    d. Parentheses

10. What will be the value of x after the following code is executed?

    ```
    int x = 10; while
    (x < 100)
    {    x +=
    10;
    }
    ```

    a. 90
    b. 100
    c. 110
    d. This is an infinite loop

11. What will be the value of x after the following code is executed?

    ```
    int x = 10, y = 20; while
    (y < 100)
    {    x +=
    y;
    }
    ```

a. 90
b. 110
c. 210
d. This is an infinite loop

12. _____ is the process of inspecting data given to the program by the user and determining if it is valid.
   a. Data parsing
   b. Input validation
   c. User authentication
   d. Defensive coding

13. This type of loop allows the user to decide the number of iterations.
   a. Counter-controlled loop
   b. Dynamically executed loop
   c. User controlled loop
   d. Infinite loop

14. In the following code, what values could be read into `number` to terminate the `while` loop?

```
Scanner keyboard = new Scanner(System.in);
System.out.print("Enter a number:  "); int
number = keyboard.nextInt(); while (number
< 100 && number > 500)
{
    System.out.print("Enter another number:  ");
number = keyboard.nextInt();
}
```
   a. Numbers less than 100 or greater than 500
   b. Numbers in the range 100 - 499
   c. Numbers in the range 100 - 500
   d. The `boolean` condition can never be true

15. What will be the value of `x` after the following code is executed?

```
int x = 10;
do {
    x *= 20;
}
while (x > 5);
```

   a. 10
   b. 200
   c. This is an infinite loop.
   d. The loop will not be executed, the initial value of `x > 5`.

16. How many times will the following `do-while` loop be executed?

```
int x = 11; do {
x += 20; } while
(x > 100);
```

    a. 0
    b. 1
    c. 4
    d. 5

17. A loop that repeats a specific number of times is known as a(n)
    a. sentinel loop
    b. conditional loop
    c. counter-controlled loop
    d. infinite loop

18. How many times will the following `for` loop be executed?

```
for (int count = 10; count <= 21; count++)
System.out.println("Java is great!!!");
```

    a. 1
    b. 10
    c. 12
    d. 0

19. What will be the value of x after the following code is executed?

```
int x = 10; for (int y = 5; y
< 20; y +=5)    x += y;
```

    a. 40
    b. 25
    c. 30
    d. Invalid `for` statement

20. This is a value that signals when the end of a list of values has been reached.
    a. Terminal value
    b. Final value
    c. End value
    d. Sentinel

21. Before entering a loop to compute a running total, the program should first do this.
    a. Read all the values into main memory
    b. Set the accumulator where the total will be kept to an initial value, usually zero
    c. Know exactly how many values there are to total
    d. Set all variables to zero

22. This type of loop is ideal in situations where the exact number of iterations is known.
    a. `while` loop
    b. `do-while` loop
    c. `for` loop
    d. `if` statement

23. Given the following statement, which statement will write "Calvin" to the file DiskFile.txt?

    `PrintWriter diskOut = new PrintWriter("DiskFile.txt");`

    a. `System.out.println(diskOut, "Calvin");`
    b. `DiskFile.println("Calvin");`
    c. `PrintWriter.println("Calvin");`
    d. `diskOut.println("Calvin");`

24. When using the `PrintWriter` class, which of the following `import` statements would you write near the top of your program?
    a. `import javax.swing.*;`
    b. `import java.io.*;`
    c. `import PrintWriter;`
    d. `import java.file.*;`

25. Which of the following will open a file named MyFile.txt and allow you to append data to its existing contents?
    a. `FileWriter fwriter = new FileWriter("MyFile.txt", true); PrintWriter outFile = new PrintWriter(fwriter);`

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

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

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

26. Assume that `inputFile` references a `Scanner` object that was used to open a file. Which of the following `while` loops shows the correct way to read data from the file until the end of the file is reached?
    a. `while (inputFile != null) { … }`

b.   `while (!inputFile.EOF) { … }`

c.   `while (inputFile.hasNext()) { … }`

d.   `while (inputFile.nextLine == " ") { … }`

27.   What will be the values of x and y as a result of the following code?

```
int x = 12, y = 5; x
+= y--;
```

a.   x = 12, y = 5
b.   x = 16, y = 4
c.   x = 17, y = 5
d.   x = 17, y = 4

28.   What will be the value of x after the following code is executed?

```
int x, y = 15, z = 3; x
= (y--) / (++z);
```

a. 3
b. 4
c. 5
d. 6

29.   In all but rare cases, loops must contain within themselves
      a.   arithmetic statements
      b.   `if` statements
      c.   a way to terminate
      d.   nested loops

30.   Which of the following are pre-test loops?
      a.   `while, for, do-while`
      b.   `while, do-while`
      c.   `while, for`
      d.   `for, do-while`

31.   What will be the value of x after the following code is executed?

```
int x = 10;
while (x < 100);
{    x += 10;
}
```

a.   90
b.   100
c.   110
d.   This is an infinite loop

32. What will be the value of x after the following code is executed?

```
int x = 10, y = 20;
while (y < 100) {
x += y;    y += 20;
}
```

a. 90
b. 110
c. 130
d. 210

33. In the following code, what values could be read into `number` to terminate the `while` loop?

```
Scanner keyboard = new Scanner(System.in);
System.out.print("Enter a number:   "); int
number = keyboard.nextInt(); while (number
< 100 || number > 500)
{
    System.out.print("Enter another number:   ");
number = keyboard.nextInt();
}
```

a. Numbers less than 100
b. Numbers greater than 500
c. Numbers in the range 100 - 499
d. Numbers in the range 100 - 500

34. What will be the value of x after the following code is executed?

```
int x = 10;
do {    x
*= 20; }
while (x < 5);
```

a. 10
b. 200
c. This is an infinite loop.
d. The loop will not be executed, the initial value of x > 5.

35. How many times will the following `do-while` loop be executed?

```
int x = 11;
do {    x
+= 20; }
while (x <= 100);
```

a. 1
b. 3
c. 4

d. 5

36. A loop that executes as long as a particular condition exists is called a(n)
    a. sentinel loop
    b. conditional loop
    c. count-controlled loop
    d. infinite loop

37. A `for` loop normally performs which of these steps?
    a. initializes a control variable to a starting value
    b. tests the control variable by comparing it to a maximum/minimum value and terminate when the variable reaches that value
    c. updates the control variable during each iteration
    d. all of the above
    e. None of the above

38. What will be printed after the following code is executed?

```
for (int number = 5; number <= 15; number +=3)
    System.out.print(number + ", ");
```

    a. 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
    b. 5, 8, 11, 14, 17,
    c. 5, 8, 11, 14,
    d. This is an invalid `for` statement

39. This is a sum of numbers that accumulates with each iteration of a loop.
    a. Running total
    b. Final total
    c. Grand finale
    d. Galloping total

40. A sentinel value _____ and signals that there are no more values to be entered.
    a. is a different data type than the values being processed
    b. is a special value that cannot be mistaken as a member of the list
    c. indicates the start of a list
    d. guards the list

41. This type of loop is ideal in situations where you always want the loop to iterate at least once.
    a. `while` loop
    b. `do-while` loop
    c. `for` loop
    d. `if` statement

42. This is an item that separates other items.
    a. Controller
    b. Partition

c. Doorway
d. Delimiter

43. Which of the following will open a file named MyFile.txt and allow you to read data from it?
    a. `File file = new File("MyFile.txt");`

    b. `Scanner inputFile = new Scanner("MyFile.txt");`

    c. `File file = new File("MyFile.txt"); Scanner inputFile = new Scanner(file);`

    d. `PrintWriter inputFile = new PrintWriter("MyFile.txt");`

44. Assuming that `inputFile` references a `Scanner` object that was used to open a file, which of the following statements will read an `int` from the file?
    a. `int number = inputFile.nextInt();`
    b. `int number = inputFile.next();`
    c. `int number = inputFile.readInt();`
    d. `int number = inputFile.integer();`

45. You can use this method to determine whether a file exists.
    a. The `Scanner` class's `exists` method
    b. The `File` class's `exists` method
    c. The `File` class's `canOpen` method
    d. The `PrintWriter` class's `fileExists` method

TRUE/FALSE

1. Java provides a set of simple unary operators designed just for incrementing and decrementing variables. (TRUE)

2. The `while` loop has two important parts: (1) a `boolean` expression that is tested for a `true` or `false` value, and (2) a statement or block of statements that is repeated as long as the expression is `true`. (TRUE)

3. The `do-while` loop is a pre-test loop. (FALSE)

4. In the `for` loop, the control variable cannot be initialized to a constant value and tested against a constant value. (FALSE)

5. When the `break` statement is encountered in a loop, all the statements in the body of the loop that appear after it are ignored, and the loop prepares for the next iteration. (FALSE)

6. You can use the `PrintWriter` class to open a file for writing and write data to it. (TRUE)

7. The `do-while` loop must be terminated with a semicolon. (FALSE)

8. In a `for` statement, the control variable can only be incremented. (FALSE)

9. When the `continue` statement is encountered in a loop, all the statements in the body of the loop that appear after it are ignored, and the loop prepares for the next iteration. (TRUE)

10. A file must always be opened before using it and closed when the program is finished using it. (TRUE)

11. When you open a file with the `PrintWriter` class, the class can potentially throw an `IOException`. (TRUE)

12. When you pass the name of a file to the `PrintWriter` constructor, and the file already exists, it will be erased and a new empty file with the same name will be created. (FALSE)