Day16 Truth Tables, 3.5 Compound Boolean Expressions, if statements Name: Key 9/15/22

1.

A	B	A && B	A || B
T	T	T	T
T	F	F	T
F	T	F	T
F	F	F	F

2.

Always fill in the A and B columns like I did on the first one. That's how you start these problems. (If you prefer using 1s and 0s over Ts and Fs, that's fine, the form is what matters.)

A	B	!A	!A && B	A || B	!(A || B)
T	T	F	F	T	F
T	F	F	F	F	T
F	T	T	T	T	F
F	F	T	F	T	F

3. Test the variable, **value**, with a single if statement. If it is between 23 and 78 inclusive, print "yes".

```
int value = /* Code not shown sets value to a valid integer */
```

```
if (value > 22 && value < 79) System.out.println("yes");
   or value >= 23 && value <= 78
```

4. Mixing it up: make a truth table for (!A || B) && !B

A	B	!A	!B	!A || B	(!A || B) && !B
1	1	0	0	1	0
1	0	0	1	0	0
0	1	1	0	1	0
0	0	1	1	1	1

I switched to using 1s and 0s here just because. Either T/F or 1/0 is fine.

5. Fill out this truth table then choose the best answer below:

A	B	!B	A || !B	A && B	(A&&B) || !B	(A || !B) && ((A&&B) || !B)
1	1	0	1	1	1	1 ← true here
1	0	1	1	0	1	1
0	1	0	0	0	0	0
0	0	1	1	0	1	1 ← and here

Which statement is true about the above truth table? (circle your choice)

a. the final column is false when A and B are the same. b. the final column is true when A and B are the same.

6. Given the following variable declarations:

```
int x = 4;
int y = -3;
int z = 4;
```

What are the results of the following relational expressions (true or false)?

`x == 4` T

`x + y > 0` T

`y * y <= z` F

`x == y` F

`x - z != 0` F

`y / y == 1` T

`x == z` T

`y == z` F

`x * (y + 2) > y - (y + z) * 2`

$4(-1) \stackrel{?}{>} -3-(1)\cdot 2$ T

$-4 \stackrel{?}{>} -3-2$

$-4 > -5$ yes

7. What is printed, if anything, when the following code runs?

```
int temp = 65;
if(temp>74)
   System.out.println("It is not cold.");
   System.out.println("Turn on the fan.");
```

Turn on the fan

8. What is wrong with this if statement?

```
if (cost = 5;)
{
  System.out.println("the cost is 5");
}
```

1. no parens
2. one = , needs ==
3. should not have a ;

9. Assume you have two integer variables a and b properly initialized. Write an if statement that checks if a is greater than b and prints "yes" if so.

```
if (a>b)
   System.out.println("yes");
```

10. What is printed when the following code runs?

```
int a = 7;
int b = 9;
if(a>b)
   System.out.println("A");
   System.out.println("B");
if(b==a)
   System.out.println("C");
   System.out.println("D");
if(a!=b)
{
   System.out.println("E");
   System.out.println("F");
}
```

BDEF

11. What is printed when the following code runs?

```
int score = 93;
if (score >= 90) grade = "A";
if (score >= 80) grade = "B";
if (score >= 70) grade = "C";
if (score >= 60) grade = "D";
System.out.println(grade);
```

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