

This worksheet is for your use during and after lecture. It will not be collected or graded, but I think you will find it a useful tool as you learn C++ and study for the exams. Explain all false answers for the “True or False” questions; in general, show enough work and provide enough explanation so that this sheet is a useful pre-exam review. I will be happy to review your answers with you during office-hours, via Email, or instant messaging.

1. Match the C++ operators with the correct relational or Boolean description at the right

%	J	<<	J
=	J	>>	J
>=	F	!	G
&&	H		I
++	J	<=	E
<>	J	%=	J
<	C	@	J
>	D	!=	B
==	A	><	J

A is equal to
 B is not equal to
 C is less than
 D is greater than
 E is less than or equal to
 F is greater than or equal to
 G logical inverse or NOT
 H logical intersection or AND
 I logical union or OR
 J Not a C++ relational or Boolean operator.

2. State the value (true or false) of each Boolean expression. One of them is buggy, and probably doesn't reflect the logic the programmer intended – which is it?

- (a) ((1 == 1) || (2 != 3)) True
 (b) ((1 < 1.01) && (2 > 3 - 2)) True
 (c) (1 <= 3 <= 1) True
 (d) (2<=2 && 3==1) False

Solution: c is buggy, the programmer wants to write (1<=3) && (3<=1). This is a contrived example, Usually this type of error is written in code like this: 1 <= x <= 3, where the programmer wants to test $x \in [1, 3]$. But for what values of x is this true or false? Does it really test what the programmer intended? Also, note that b and ?? are evaluated the same, since the parenthesis in b do not change the order of operations.

3. Which of the following represents an instruction *sequence* in C++?

- A. A single C++ statement *except* for a lone ; on a line.
 B. 1 or more C++ statements *including* a lone ; on a line.
 C. More than one C++ statement.

Solution: B

4. C++, like many programming languages, has *selection statements* or *selection structures*. Explain precisely what they “select” in a program.

Solution: They select a sequence of instructions for the CPU to follow, also known as the *code path*.

5. What will be printed on the console by the code below? Use the chart at the right to record changes in variable values.

```
1 int x(9), y(7), z(2), k(0);
2 double m(1.1), j(0);
3
4 if (x > y) {
5     if (y > z && y > k) {
6         m--;
7     } else {
8         k++;
9     }
10 } else {
11     j++;
12 }
13
14 cout << "m=" << m << endl;
15 cout << "k=" << k << endl;
16 cout << "j=" << j << endl;
```

Line #	x	y	z	k	m	j

Solution:

```
m=0.1
k=0
j=0
```