

**COMP 430**  
**Summer 2025**

**Typechecking / Semantic Analysis**

For each of the following expressions, write what the type of the expression is if it's well-typed, or mark it as ill-typed. In either case, be able to explain *why*.

Expression	Type (or ill-typed)
8	
"foo"	
"foo" + "bar"	
"foo" + 8	
'c' + 2	
2 == 3	
'a' == 'a'	
'a' == 27	
(1 + 2) < ("foo" + "bar")	

For each of the **complete** code snippets below, state if it's well-typed or ill-typed. Be able to explain why.

Snippet	Well-typed / Ill-typed
<pre>int x = 7; int y = x + x;</pre>	
<pre>int x = a;</pre>	
<pre>int x = 0; while (x &lt; 10) {     x = x + 1;     break; }</pre>	
<pre>int x = 7; break;</pre>	
<pre>int add(int a, int b) {     return a + b; } void main() {     add(7, 8); }</pre>	
<pre>char foo() {     char c = 'a'; }</pre>	
<pre>struct Foo {     int x;     char x; };</pre>	
<pre>struct Bar {     int x;     char y; }; int blah(struct Bar b) {     return b.x; }</pre>	
<pre>struct Baz { int alpha; };  int foobar(struct Baz b) {     return b.beta; }</pre>	