COMP 430
Spring 2020

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
`int x = 7;` `int y = x + x;`	
`int x = a;`	

`int x = 0;`
`while (x < 10) {`
`  x = x + 1;`
`  break;`
`}`	

`int x = 7;` `break;`	

`int add(int a, int b) {`
`  return a + b;`
`}`
`void main() {`
`  add(7, 8);`
`}`	

`char foo() {`
`  char c = 'a';`
`}`	

`struct Foo {`
`  int x;`
`  char x;`
`};`	

`struct Bar {`
`  int x;`
`  char y;`
`};`
`int blah(struct Bar b) {`
`  return b.x;`
`}`	

`struct Baz { int alpha; };`
 	
`int foobar(struct Baz b) {`
`  return b.beta;`
`}`	