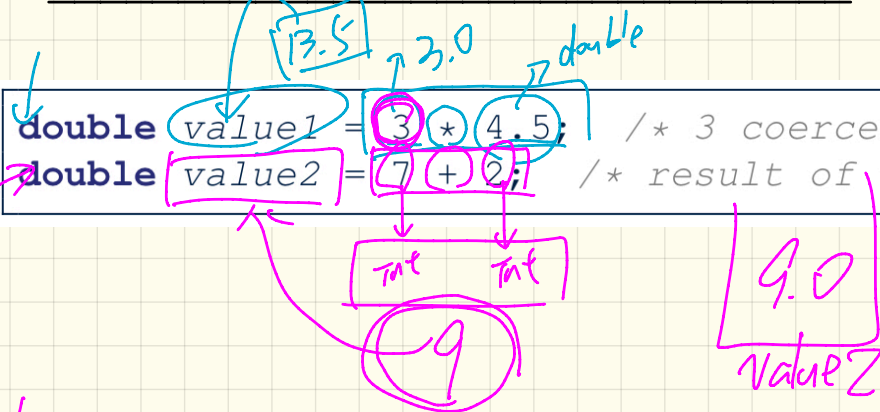


Wednesday January 16
Lecture 4

- Quiz I guide posted
- Lab I programming tasks posted
- Lab Test I guide (tomorrow)

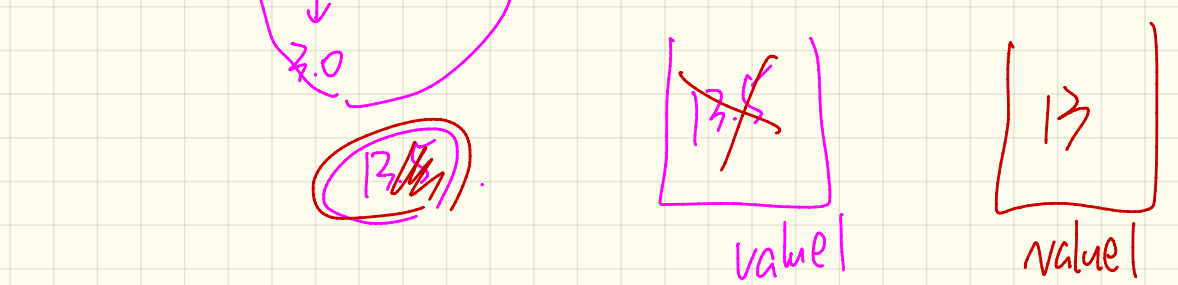
Automatic Coercion: int to double

```
double value1 = 3 * 4.5; /* 3 coerced to 3.0 */  
double value2 = 7 + 2; /* result of + coerced to 9.0 */
```



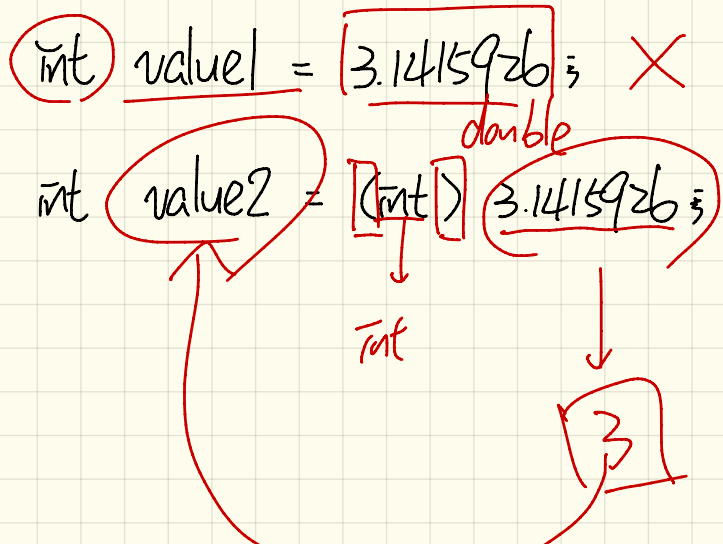
However, does the following work?

```
int value1 = 3 * 4.5; X
```

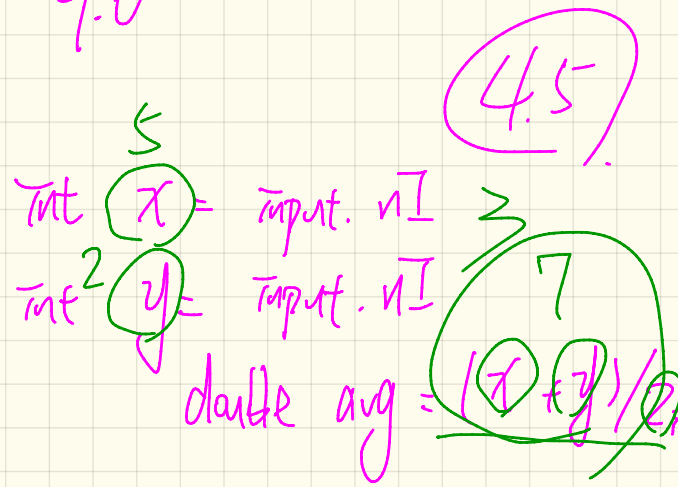
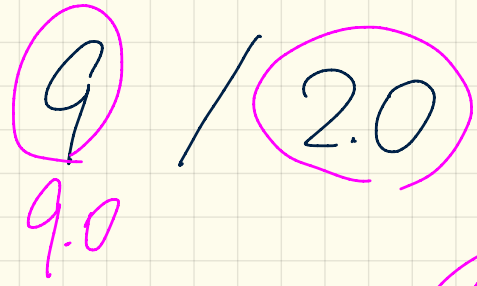
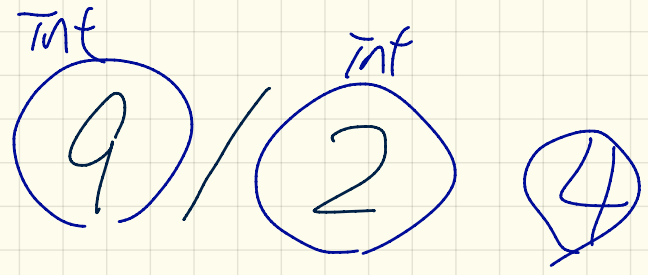


Manual Casting

Case 1: double to int

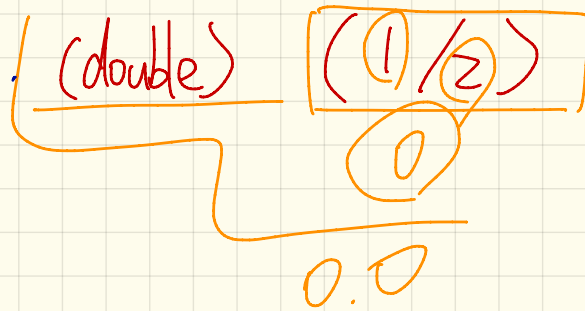


$$(x.0 + y) / z$$



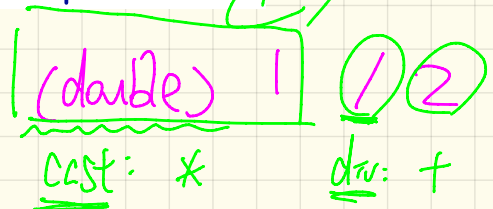
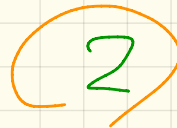
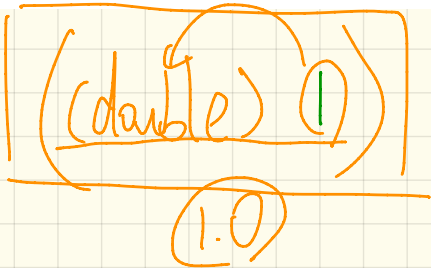
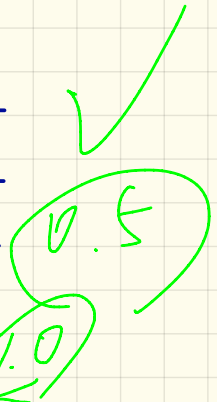
Manual Casting

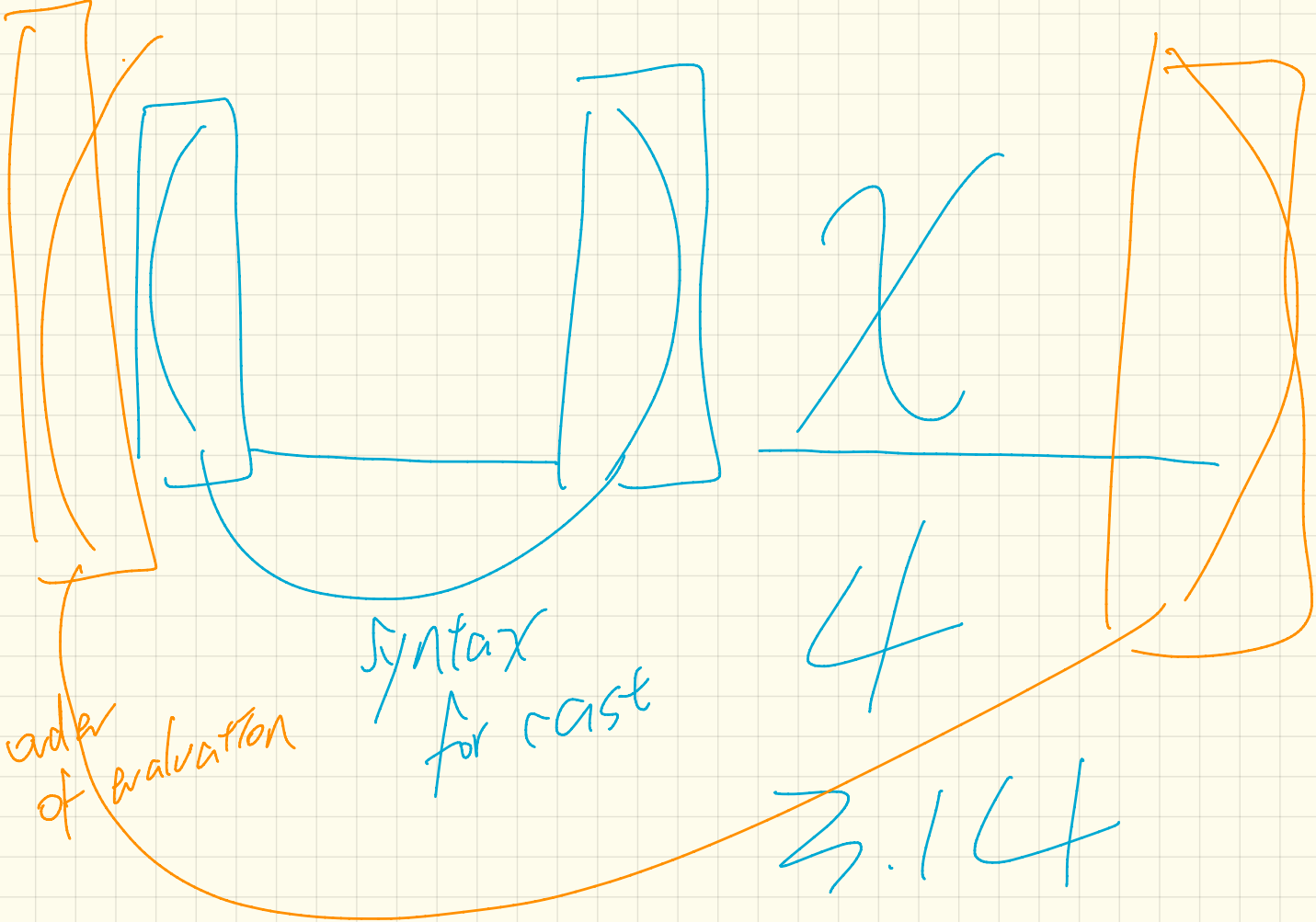
Precedence



Case 2: int to double

1	System.out.println(1) / 2);	/* 0 */
2	System.out.println(((double) 1) / 2);	/* 0.5 */
3	System.out.println(1 / ((double) 2));	/* 0.5 */
4	System.out.println(((double) 1) / ((double) 2));	/* 0.5 */
5	System.out.println((double) 1 / 2);	/* 0.5 */
6	System.out.println((double) (1 / 2));	/* 0.0 */





order of evaluation

syntax for cast

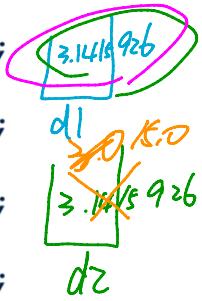
$$x / 4$$

3.14

Exercise

Consider the following Java code:

```
1 double d1 = 3.1415926;  
2 System.out.println("d1 is " + d1);  
3 double d2 = d1;  
4 System.out.println("d2 is " + d2);  
5 int i1 = (int) d1;  
6 System.out.println("i1 is " + i1);  
7 d2 = i1 * 5;  
8 System.out.println("d2 is " + d2);
```



Write the **exact** output to the console.

```
d1 is 3.1415926  
d2 is 3.1415926  
i1 is 3  
d2 is 15.707957
```

```
3  
i1
```

Exercise

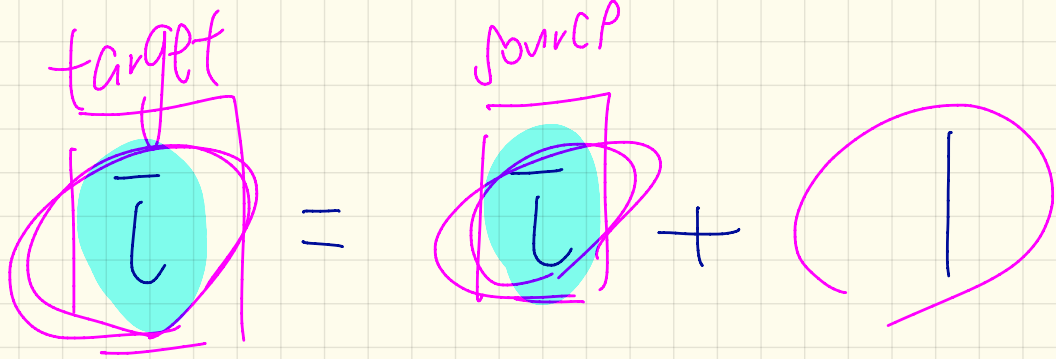
Consider the following Java code, is each line type-correct?
Why and Why Not?

```
1 double d1 = 23.0;
2 int i1 = 23.6;
3 String s1 = " ";
4 char c1 = " ";
```

Handwritten notes: $\text{int } i1 = (\text{int}) 23.6;$ (with arrow pointing to line 2), 23.0 (above line 1), 23 (circled), 23 (circled), 69 (circled), and various 'X' marks indicating errors.

```
1 int i1 = (int) 23.6;
2 double d1 = i1 * 3;
3 String s1 = "La ";
4 String s2 = s1 + "La Land";
5 i1 = (s2 * d1) + ((i1 + d1));
```

Handwritten notes: 23 (circled), 23 (circled), 69 (circled), 19.0 (circled), $concat$ (arrow pointing to line 3), $double$ (circled), $String$ (circled), $double$ (circled), $int + double$ (circled), $double$ (circled), $conversion$ (circled).



- ① $\bar{l} + = 1$
- ② $\bar{l} + +$

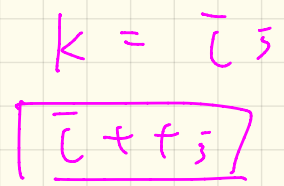
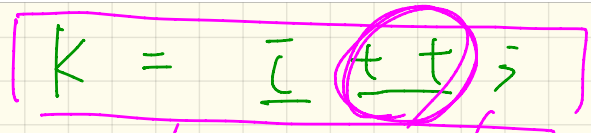
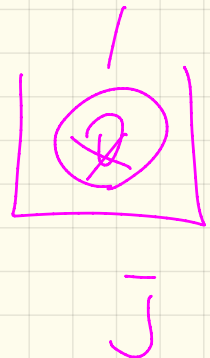
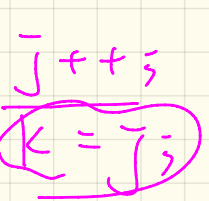
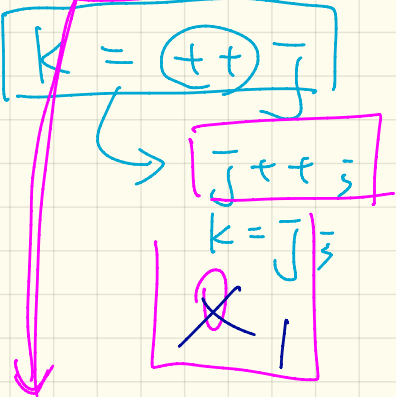
$\bar{l} = \bar{l} * \leq$

$\bar{l} (* =) \leq$

Exercise

$$k = \bar{i}$$
$$\underline{\bar{i} + i}$$

```
int i = 0; int j = 0; int k = 0;  
k = i++; /* k is assigned to i's old value */  
k = ++j; /* k is assigned to j's new value */
```



Comparison of Values

int
double
char
boolean

use ==

e.g.

```
char c1 = 'a';  
println ( c1 == 'b' );
```

False

String

use equals

e.g.

```
String s1 = input.nextLine();  
println ( s1.equals("quit") );
```

s1 == "quit"

compile but not working

Escape Sequence

```
String s1 = "A";  
String s2 = "B";
```

///

start

println ("//");

start or end?

```
print (s1);  
print (s2);
```

AB

```
println (s1);  
println (s2);
```

A
→ B

```
print (s1 + "\n");  
print (s2);
```

new line
A
→ B