

COS 135 Individual Assignment 3

Due: Monday 02/13/23 End of the day

This assignment has 2 sections. For part #1 (use the answering template attached), for part #2 submit the .c source file.

Part #1 (50pts) use the answering template attached. Refer to the C operator precedence guide in last page.

1. (20 pts.) Calculate the result of each expression using the provided variables (consider them as individual statements). Place a decimal point in your answer to indicate a double value (ex. 2.0).

```
double x = 2.1;
```

```
double y = 1.2;
```

```
int m = 12;
```

```
int n = 2;
```

I. $x + y * 2.0 - 1.2$

II. $m * n + m \% n$

III. $1 / n \% m$

IV. $n / m + 2.0$

V. $3 * 7 - 1 + m * n$

VI. $15.0 + x / y / y$

VII. $n++ * 4 / 3$

VIII. $x + m * n - 1$

IX. $33 \% 7 - (1 + x) * n$

X. $(3.0/4.0) + (1/2)$

2. (10 pts.) Write each math equation in C statements.

`double x, y, z, w;`

I. $w = \frac{x^3}{y^2(z+x)}$

II. $w = x + 2y + \frac{z-x}{3.0}$

III. $w = x^2 + y^2 + z^2$

IV. $w = x^4 \% 5 * \frac{-z-y-x}{4z} * y^2$

V. $w = x^2 * y^2 * z^4$

3. (20 pts.) Compute the Boolean value (1 or 0) of each condition.

`int x = 5, y = 10, z = 0;`

I. $x + y \geq y - 4$

II. $x == 5 \mid \mid y > z \ \&\& \ x > 10$

III. $!(x == z)$

IV. $y != 6 \ \&\& \ y < x * 2$

V. $x < y \ \&\& \ y < 20$

VI. $x * x < y \mid \mid 2 * y == 14$

VII. $(x == 5 \mid \mid y > 0) \ \&\& \ x > 10$

VIII. z

IX. $x + y * (z + 2) > 25$

X. $!!(x == 5)$

Part #2 (50pts): write a C program for the following task and submit your source code (you must submit the .c file)

Write a C program to save (hard code in the beginning of the main() function) following information in variables (select appropriate datatypes for each). You have purchased 2 pieces of each item from the store. Output a sample receipt showing store name, individual prices, 10% of GST, and the total (you may design a suitable receipt format to output). Always maintain the precision with two decimal points. Choose appropriate identifiers for variable names.

Information to be stored in variables:

Store name: **The Z Store**

Price for item 1: **\$21.45**

Price for item 2: **\$10.00**

Price for item 3: **\$14.90**

Price for item 4: **\$33.50**

Program output:

Welcome to The Z Store

Item 1	\$21.45	x2	\$42.90
Item 2	\$10.00	x2	\$20.00
Item 3	\$14.90	x2	\$29.80
Item 4	\$33.50	x2	\$67.00

Item total: \$159.7

GST: \$15.97

Total: \$175.67

C Operator precedence

Precedence	Operator	Description	Associativity
1	::	Scope resolution	Left-to-right
2	++ --	Suffix/postfix increment and decrement	
	()	Function call	
	[]	Array subscripting	
	.	Element selection by reference	
3	->	Element selection through pointer	Right-to-left
	++ --	Prefix increment and decrement	
	+ -	Unary plus and minus	
	! ~	Logical NOT and bitwise NOT	
	(type)	Type cast	
	*	Indirection (dereference)	
	&	Address-of	
	sizeof	Size-of	
	new, new[] delete, delete[]	Dynamic memory allocation Dynamic memory deallocation	
4	.* ->*	Pointer to member	Left-to-right
5	* / %	Multiplication, division, and remainder	
6	+ -	Addition and subtraction	
7	<< >>	Bitwise left shift and right shift	
8	< <=	For relational operators < and ≤ respectively	
	> >=	For relational operators > and ≥ respectively	
9	== !=	For relational = and ≠ respectively	
10	&	Bitwise AND	
11	^	Bitwise XOR (exclusive or)	
12		Bitwise OR (inclusive or)	
13	&&	Logical AND	
14		Logical OR	Right-to-left
15	?:	Ternary conditional ^[1]	
	=	Direct assignment (provided by default for C++ classes)	
	+= -=	Assignment by sum and difference	
	*= /= %=	Assignment by product, quotient, and remainder	
	<<= >>=	Assignment by bitwise left shift and right shift	
16	&= ^= =	Assignment by bitwise AND, XOR, and OR	
	throw	Throw operator (for exceptions)	
17	,	Comma	Left-to-right