

Exercise 1: Defining constants

1. Launch the terminal
2. Create a new directory with the name "Lab02" inside "CSC215"
3. Write the program "ex1.c" that:
 - a. uses `#define` preprocessor to define a character constant that contains the horizontal tab character
 - b. uses `const` keyword to define a string that contains CSC and an integer that contains 215
 - c. prints CSC, then the horizontal tab, then 215, all using the above mentioned constants.
4. Compile and run your program. 1 point

Exercise 2: Evaluating expressions

1. Write the program "ex2.c" that:
 - a. declares three integer variables: a, b and c.
 - b. initialize them to a = 1, b = 10, c = 0.
 - c. prints the following output lines using the printf function:

```
a=<a> b=<b> c=<c>
a++ + <b> = <a++ + b>
++a + <b> = <++a + b>
<a> && <c> = <a && c>
<a> || <c> = <a || c>
<a> & 2 = <a & 2>
<a> | 0 = <a | 0>
<a> << 2 = <a << 2>
<a> >> 1 = <a >> 1>
```

You may need to use two printf statements
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Note: `<expression>` here means value of expression

For example, to achieve the first line use the statement: `printf("%d %d %d\n", a, b, c);`

2. Compile and run your program. 1 point

Exercise 3: Reading, processing and displaying Results

1. Write the program "ex3.c" that:
 - a. declares a constant $\pi = 3.14$
 - b. reads the radius and the color of a circle
 - c. calculates the area of this circle
 - d. prints the color and the area in the format shown in the sample run.

```
Enter the circle radius > 12
Enter the circle color > Red
The Red circle area = 452.16
```

Note: The circle area formula is: $\pi \times r^2$, where r is the radius of the circle

2. Compile and run the program. 1 point
3. The header file `math.h` defines the constant `M_PI`. Modify your program to calculate the area using this constant.
4. Recompile without `-ansi` and run your program and note the difference. 1 point

Exercise 4: Formatting outputs using printf

- Write the program "ex4.c" that prints the following values in the indicated formats:

<22/7>	as a float number
<22/7>	as a float with 10 decimal digits
<22/7>	as a float of length 20 with 10 decimal digits
<22/7>	as a float of length 20 with 10 decimal digits and leading os
<22/7>	as a float with 10 decimal digits and display the sign
<22/7>	as a float with 10 decimal digits as a percentage
<22/7>	as a float in the scientific notation
31567	in the hexadecimal system
"Good morning"	the first 4 characters of the string
"Good morning"	the first 4 characters of the string reserving a length of 10
- Compile and run your program. 1 point

Lab assignment:

5 points

Write a C program assignment.c that prints the powers of the integers variables a = 1, b = 2 and c = 3 in a tabular format as below:

Expected output:

: : : : : Powers Table : : : : :			
Number	Square	Cube	4th power
1	1	1	1
2	4	8	16
3	9	27	81

Note: Attach your five programs ex1.c, ex2.c, ex3.c, ex4.c and assignment.c to an email message with Lab02 in the subject field and send it to your lab instructor: alshibli+csc215@ccis.edu.sa or ppathak@ksu.edu.sa