



Pakistan Institute of Engineering and Applied Sciences

Computing Fundamentals & Programming

**Fall 2022
Laboratory Exercise-02**

November 24, 2022

Instructions:

1. Using Mobile Without Permission Will Be Marked As Absent And 50% Marks Of This Lab Will Be Deducted.
2. Copying Assignment / Using the internet During Lab tasks and Marking Proxy will Lead you to an “F” Grade in the Lab. Be very careful.
3. Use an appropriate naming convention for variable name. e.g to calculate the sum of the number variable name can be sum, sum_of_number. Random variable names are not allowed.
4. Lab Tasks must be submitted in pdf with a screen shot of output.
5. File name should be as

Degree_Full Name
6. **Submission Deadline of Lab Task is on the same day, during Lab, by 3:20 pm**
7. **Submission Deadline of Home Task of Lab 02 is Wed. Nov. 30, 2022 (3:00 PM)**

Topics Covered

1. Initialization with Declaration
2. Printf
3. Math library file
4. Power function
5. Sqrt function
6. Exponential function
7. Logarithmic function
8. Arithmetic operations

SA - Task -1

Write a c program in which ask the user to enter the values of v_i , a , and t in SI units. Your code should compute and display the value of v_f in appropriate unit.

SA - Task -2

Write a c program in which ask the user to enter the values of v_f , a , and t in SI units. Your code should compute and display the value of v_i in appropriate unit.

SA - Task -3

Write a c program in which ask the user to enter the values of v_i , v_f , and t in SI units. Your code should compute and display the value of a in appropriate unit.

WL - Task -1

Write a c program in which ask the user to enter the values of v_i , v_f , and a in SI units. Your code should compute and display the value of s in appropriate unit.

WL - Task -2

Write a c program in which ask the user to enter the values of v_i , a , and t in SI units. Your code should compute and display the value of s in appropriate unit.

WL - Task -3

Write a c program in which ask the user to enter the values of temperature in centigrade. Your code should compute and display the value of temperature in Fahrenheit.

WL - Task -4

Write a c program in which ask the user to enter the values of temperature in Fahrenheit. Your code should compute and display the value of temperature in centigrade.

WL - Task -5

Suppose three resistances are connected in series. Write a C program in which take the values of these three resistances in ohms. Your code should compute and display the resultant resistance.

WL - Task -6

Suppose three resistances are connected in parallel. Write a C program in which take the values of these three resistances in ohms. Your code should compute and display the resultant resistance.

WL - Task -7

Write a c program in which ask the user to enter the values of length and width of a rectangle in centimeters. Your code should compute and display the area along with units.

WL - Task -8

Write a c program in which ask the user to enter the value of radius of a circle in cm. Your code should compute and display the area along with units.

WL - Task -9

Write a c program in which ask the user to enter the value of an integer. Your code should compute and display square and cube of the entered value.

WL - Task -10

Write a c program in which ask the user to enter the value of a float value. Your code should compute and display square and cube of the entered value.

WL - Task -11

Write a c program in which ask the user to enter two integer values. Your code should compute and display addition, subtraction, multiplication and division of these two values.

SA - Task -4

Write a c program which declare integer variables Vf, Vi, at. Initialize these with integer values and display the mathematical expressions on the screen.

```
/*
C program to demonstrate Declaration and initialization
C program to demonstrate int data type
*/

#include <stdio.h>
int main()
{
int Vf,Vi=1,at=3;
Vf=Vi+at;
printf("Final Velocity is = %d \n",Vf);
Vf=Vi-at;
printf("Final Velocity is = %d \n",Vf);
Vf=Vi-0.5;
printf("Final Velocity is = %d \n",Vf);
Vf=Vi+Vi*at;
printf("Final Velocity is = %d \n",Vf);
}
```

SA- Task -5

Write a c program which declare and define integer variables F,m,a. Initialize these with integer values and display these formulas on the screen.

```
/*
C program to demonstrate Declaration and
initialization
C program to demonstrate int data type Formulas
*/

#include <stdio.h>
int main()
{
int F,m=1,a=3;
F=m*a;
printf("Force is = %d Newtons \n",F);
F=m+a;
printf("Force is = %d Newtons \n",F);
F=m-a;
printf("Force is = %d Newtons \n",F);
}
```

WL - Task -12

Write a similar c program which initialize Vf, Vi=1.2345, at=3.6789 and print formulas

Output

```
Final Velocity is = 4.913400
Final Velocity is = -2.444400
Final Velocity is = 0.734500
Final Velocity is = 5.776102

-----
Process exited after 0.006703 seconds with return value 0
Press any key to continue . . .
```

WL - Task -13

Write a C program for a formula Force=ma, m=1,a=3

```
Force is = 38.351501 Newtons
Force is = 14.120000 Newtons
Force is = 6.780000 Newtons

-----
Process exited after 0.01907 seconds with return value 0
Press any key to continue . . .
```

WL - Task -14

Write a C program for formula $k=F/m$ integers are K, F=1, and m=3, whose output is as follows.

```
K = F/m
K value is = 0.333333

-----
Process exited after 0.018 seconds with return value 0
Press any key to continue . . .
```

WL - Task -15

Write a C program to implement a formula $E=mc^2$ (Hint: Include `#include <math.h>` at the top for C^2). Declare m=1, c=3

```
Energy= 9 units

-----
Process exited after 0.005512 seconds with return value 0
Press any key to continue . . .
```

WL - Task -16

Write a C program to implement a formula, $2aS = V_f^2 - V_i^2$. $V_f=1, V_i=3$

Output

```
as is equal - -8 units
-----
Process exited after 0.01640 seconds with return value 0
Press any key to continue . . .
```

WL - Task -17

Write a C program to implement a formula $T = 2\pi \sqrt{L/g}$ (Hint: Include `#include <cmath>`), $L=1, g=10$

```
Timeperiod = 1.986918 units
-----
Process exited after 0.01071 seconds with return value 0
Press any key to continue . . .
```

WL - Task -18

```
R = 0.089400 units
-----
Process exited after 0.02416 seconds with return value 0
Press any key to continue . . .
```

WL - Task -19

Write a C program to implement a formula $V_x = V \cos x, V_y = V \sin x$ (Hint: Include `#include <cmath>`), $V=1, x=45$

```
Vx = 5.253220 units
Vy = 8.509035 units
-----
Process exited after 0.06274 seconds with return value 0
Press any key to continue . . .
```

Write a C program to implement a formula (a) e^x (b) e^{-x} (c) e^{2x} (d) e^{-2x} , $x=10$ (Hint: Include `#include <cmath>`),

```
y1 = 22026.464844 units
y2 = 0.000045 units
y3 = 485165184.000000 units
y4 = 0.000000 units

-----
Process exited after 0.0411 seconds with return value 0
Press any key to continue . . .
```

WL - Task -21

Write a C program to implement a formula (a) $y_1 = \log(x)$ (b) $y_2 = \log(2 \cdot x)$ (c) $y_3 = \log(3 \cdot x)$ (Hint: Include `#include <math.h>`),

```
y1 = 2.302585 units
y2 = 2.995732 units
y3 = 3.401197 units

-----
Process exited after 0.02402 seconds with return value 0
Press any key to continue . . .
```

Q1. Write a c program for following formulas

- (a) $X = X_1 \cdot \cos(2 \cdot \pi \cdot t / T)$
- (b) $Y = (\sqrt{F / m \cdot l})$
- (c) $Z = q \cdot v \cdot B \cdot \sin(x)$

Q2. Write a C program for following formulas

$$c = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$$
$$\frac{E}{B} = c$$
$$c = f \lambda$$
$$I_{ave} = \frac{c \epsilon_0 E_0^2}{2}$$
$$I_{ave} = \frac{c B_0^2}{2 \mu_0}$$
$$I_{abe} = \frac{E_0 B_0}{2 \mu_p}$$