Course : Programming Fundamental – ENSF 337

Lab # : Lab 1

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Lab Section : B02

Date submitted : Sept 9, 2022

Exercise 1

```
/*
* File Name: lab_one.c
* Assignment: Lab 1 Exercise B
* Lab section: B02
* Completed by: Nimna Wijedasa
* Submission Date: Sept 18, 2022
*/

#include <stdio.h>
int main()
{
   double num1 = -34.5;
   double num2 = 98.7;

   double sum;        // sum of num1 and num2
   double sumSquared;  // the square of num2 plus num2

   // 1) Add the two numbers and store the result in the variable 'sum'

         sum = num1 + num2;

   // 2) Compute the square of the sum and store the result in the variable  'sum Squared'
   //    Use the variable 'sum' (computed above) for this computation

         sumSquared = sum*sum;
         printf( "The sum squared is: %f \n", sumSquared );

   // 3) Now double the sum squared value and store the result in 'sumSquared'

         printf( "The sum squared is now: %f \n", sumSquared);

          sumSquared = sumSquared*2;
```

```
    return 0;
}
```

Lab2 〉 Lab2 〉 C lab2a.c 〉 main()

```c
/*
* File Name: lab_one.c
* Assignment: Lab 1 Exercise B
* Lab section: B02
* Completed by: Nimna Wijedasa
* Submission Date: Sept 18, 2022
*/

#include <stdio.h>
int main()
{
    double num1 = -34.5;
    double num2 = 98.7;

    double sum;         // sum of num1 and num2
    double sumSquared;  // the square of num2 plus num2

    // 1) Add the two numbers and store the result in the variable 'sum'

     sum = num1 + num2;

    // 2) Compute the square of the sum and store the result in the variable  'sum Squared'
    //    Use the variable 'sum' (computed above) for this computation

sumSquared = sum*sum;
printf( "The sum squared is: %f \n", sumSquared );

    // 3) Now double the sum squared value and store the result in 'sumSquared'


sumSquared = sumSquared*2;
printf( "The sum squared is now: %f \n", sumSquared);

     return 0;
}
```

```
The sum squared is: 4121.640000
The sum squared is now: 8243.280000
Program ended with exit code: 0
```

Exercise 2

```
double z =      0;
double x =      2.5;
double y =      -1.5;
int m    =      18;
int n    =      4;
```

Now, what are the values of z in the following expressions? Show your work.

a) `z=x+n*y-(x+n)*y;`

z = 2.5 + (4*(-1.5)) – ((2.5+4)*(-1.5))= 2.5 – 6 + 9.75 =6.25

b) `z=m/n+m%n;`

z = 4 + 2 = 6.0

c) `z=n/m+n%m;`

z = 0 + 4 = 4.0

d) `z=5*x-n/5;`

z =12.5 – 0 =12.5

e) `z=1-(1-(1-(1-(1-n))));`

z = 1 - (1 - (1 - (4))) = 1 (- 4) = - 3

f) `z = sqrt(sqrt((double)n);`

z = sqrt(2) = 1.414

Exercise 3

```
/*
* File Name: lab_one.c
* Assignment: Lab 1 Exercise B
* Lab section: B02
* Completed by: Nimna Wijedasa
* Submission Date: Sept 18, 2022
*/

#include <stdio.h>
#include <math.h>



int main() {

   double angle, sine, taylor;

   printf("input angle \n");

   scanf("%lf",&angle);

   sine = sin(angle);

   taylor = (angle) - ((pow(angle,3)) / 6 ) + (pow(angle,5) /      (120) ) - ((pow(angle,
7))/ 5040 );

   printf("The angle is %.5lf \nThe Taylor approximation is %.5lf\n", sine,taylor);




return 0;

}
```

```
Line: 27
input angle
0
The angle is 0.00000
The Taylor approximation is 0.00000
Program ended with exit code: 0
```

```
input angle
0.5
The angle is 0.47943
The Taylor approximation is 0.47943
Program ended with exit code: 0
```

```
input angle
1.0
The angle is 0.84147
The Taylor approximation is 0.84147
Program ended with exit code: 0
```

```
input angle
2.5
The angle is 0.59847
The Taylor approximation is 0.58853
Program ended with exit code: 0
```

Exercise 3

```
/*
* File Name: lab_one.c
* Assignment: Lab 1 Exercise B
* Lab section: B02
* Completed by: Nimna Wijedasa
* Submission Date: Sept 18, 2022
*/
#include <stdio.h>
#include <math.h>

int main() {

   int a,b,c;
   float x_p, x_n, x, root_val;
   printf("input the values for the coefficients for ax^2 + bx + c \na = ");
   scanf("%d",&a);
   printf("b = ");
   scanf("%d",&b);
   printf("c = ");
   scanf("%d",&c);
   root_val = (pow(b, 2))-(4*a*c);

   if (root_val < 0) {
      root_val = root_val*(-1);
      root_val = sqrt((double)root_val);
      x = (float)(-1*b)/(float) (2*a);
      x_p = (root_val) / (2*a);
      x_n = (-1*root_val) / (2*a);
      printf("roots are %.1f +%.2fi and %.1f %.2fi \n",x,x_p,x,x_n);
   }
   else{

      root_val = sqrt((double)root_val);
      x_p = ((-1*b)+root_val) / (2*a);
      x_n = ((-1*b)-root_val) / (2*a);
```

```
      printf("roots are %.2f and %.2f\n",x_p,x_n);
   }
return 0;
}
```

```
input the values for the coefficients for ax^2 + bx + c
a = 1
b = -8
c = 15
roots are 5.00 and 3.00
Program ended with exit code: 0
```

```
input the values for the coefficients for ax^2 + bx + c
a = 4
b = -20
c = 21
roots are 3.50 and 1.50
Program ended with exit code: 0
```

```
input the values for the coefficients for ax^2 + bx + c
a = 1
b = 2
c = 2
roots are -1.0 +1.00i and -1.0 -1.00i
Program ended with exit code: 0
```

coefficients	Root 1	Root 2
a =1, b = -8, c = 15	5	3
a =4, b = -20, c = 21	3.5	1.5
a =1, b = 2, c = 2	-1+i	-1-i