CSE 115L: Programming Language I Lab (Section: 06)

Spring 2020

Lab 02 Tasks

Example: Generate random number

```
#include <stdio.h>
#include <stdlib.h>

int main(void)
{
	printf("%d\n", rand());
	printf("%d\n", rand());

	srand(1);
	printf("%d\n", rand());

	return 0;
}
```

Example: Find the ASCII value of a character

```
#include<stdio.h>

int main()
{
	char c;
	printf("Enter a character : ");
	scanf("%c" , &c);
	printf("\n\nASCII value of %c =
%d",c,c);

	return 0;
}
```

Tasks:

1. Write a program that prints three random numbers that lie between 1 to 100.
   Solution:

Solution:

```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

int main(void)
{
	srand(time(NULL)); //srand() is not mandatory
	printf("Tree random numbers between 1 and 100 are:\n");
	printf("%d\n", rand()%100 + 1);
	printf("%d\n", rand()%100 + 1);
	printf("%d\n", rand()%100 + 1);

	return 0;
}
```

2. Write a program that creates a time calculator that converts seconds to minutes and hours. [take “second” input from user]

Sample input	Sample output
Enter total seconds: 61	0 : 1 : 1

Solution:

```
#include <stdio.h>

int main(void)
{
	int time, hour, min, sec;
	printf("Enter total seconds:\n");
	scanf("%d", &time);

	//must maintain the order: find hour, minute and then second

	hour = time / 3600;  //1 hour = 3600 seconds
	time = time % 3600;  //update time to get the remaining total seconds
	min = time / 60;     //1 minute = 60 seconds
	sec = time % 60;     //remaining time is the second

	printf("%d : %d : %d\n", hour, min, sec);
	return 0;
}
```

3. Write a program that calculates the real roots of a quadratic equation.

Sample input	Sample output	
Enter a, b and c where a*x*x + b*x + c = 0 1 5 6	Root1 = -2.00 Root2 = -3.00	Quadratic Formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Solution:

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

int main(void)
{
	int a, b, c;
	double root1, root2;
	printf("Enter a, b and c where a*x*x + b*x + c = 0\n");
	scanf("%d%d%d", &a, &b, &c);

	root1 = (-b + sqrt(b*b - 4*a*c)) / (2*a);
	root2 = (-b - sqrt(b*b - 4*a*c)) / (2*a);

	printf("Root1 = %.2lf\nRoot2 = %.2lf\n", root1, root2);

	return 0;
}
```

4. Write a program that will calculate the distance between two points A and B. You need to take the coordinates of the points as user input.

Sample input	Sample output
Enter the coordinates of point A: 3 2 Enter the coordinates of point B: 9 7	Distance between A and B is 7.81

Solution:

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

int main(void)
{
	int x1, x2, y1, y2;
	/* x and y will be assigned the square values,
	and pow() returns real numbers, that is why declared float*/
	float x, y;

	printf("Enter the coordinates of point A:\n");
	scanf("%d %d", &x1, &y1);
	printf("Enter the coordinates of point B:\n");
	scanf("%d %d", &x2, &y2);

	x = pow((x1 - x2), 2);  //x = (x1 - x2)^2
	y = pow((y1 - y2), 2);  //y = (y1 - y2)^2

	//sqrt() returns real number, that is why %f
	printf("Distance between A and B is %.2f\n", sqrt(x + y));

	return 0;
}
```