Mahidol University

ITCS 201 – Fundamentals of Programming
Week 10: Functions

Name: _____ **ID:** _____

Due: today or in a lab session next week

Instructions:

- Marking lab assignments will be done in the lab
- **Compile** and **Run** your program
- **Show** and **Explain** the output to the lecturer or the lab assistance.

---------- **Lab Assignments** ----------

In this assignment, you need to write C programs for the following problems.

Lab 1: Write a function named `check()` that has three arguments. The first argument should accept an integer number, the second argument a floating-point number, and the third argument a double-precision number. The body of the function have to display the values of the data passed to the function when it is called. Make sure that your function is called from `main()`. Test the function by passing various data to it.

Example output:

```
Enter an integer: 4
Enter a floating point number: 4.5
Enter a double precision number: 5.3456

The integer is 4
The floating point number is 4.500000
The double precision number is 5.345600
```

Lab 2: Write a function named `find_abs()` that accepts a double-precision number, computes its absolute value, and displays the absolute value. The absolute value of a number is the number itself if the number is positive, and the negative of the number if the number is negative. Make sure that your function is called from main(). Test the function by passing various data to it.

Example output:
`Enter a number: -30` `The absolute value of -30 is 30`

Lab 3: Write a C program to create a HI-LO game. In this game, the computer produces a random integer between 1 and 100 and provides the user with seven tries to guess the generated number. If the user guesses the correct number, the message "Hooray, you have won!" should be displayed. After each incorrect guess, the computer should display the message, "Wrong Number, Try Again" and indicate whether the guess was too high or too low and display the number of guesses left. After seven incorrect guesses, the computer should display the message, "Sorry, you lose" and the correct number.

Example output:
Enter your guess: 10 Wrong number :(Your guess was too low. You have 6 guesses left. Try again. Enter your guess: 40 Wrong number :(Your guess was too high. You have 5 guesses left. Try again. Enter your guess: 23 Hooray, you have won!

Hint: `rand()` is a built-in function in `stdlib.h` with the following function prototype:

```
int rand(void);
```

You may use the following code to get a random integer between 1 and 100.

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

int main() {
    // Initialization, should only be called once.
    srand(time(NULL));
```

```c
    // Random an integer between 1 and 100
    int rand_number = 1 + rand() % 100;
    printf("Random number: %d\n", rand_number);
    return 0;
}
```

Bonus Lab: Write a function named `euc_dist` that accepts the coordinates of two points $x1, y1$ and $x2, y2$, then calculates and returns the distance between the two points. The distance, d, between two points is given by the formula:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

You can use `double sqrt(double x)` defined in `math.h` to compute the square root. Test the function by passing various data to it. The result should be returned and printed out from the `main()` function.

Example output:
Please enter a value for x1: 20.5 Please enter a value for y1: 55 Please enter a value for x2: 60 Please enter a value for y2: 40.7 The distance between the points is: 42.008808