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## Tutorial - Week 2

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**Objectives:** To practice with

- user defined functions
- library functions

**1. Considering the general structure of a C program. Indicate an appropriate place for:**

- function prototypes**
- function definitions**
- function calls**

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

```
#define PI 3.141
```

```
int main(void)
{
```

```
    return 0;
}
```

**2. Find and correct errors in the following function definitions**

a. 

```
void add2Numbers( int num1, int num2)
{
    int num1; int sum;

    sum = num1 + num2;
    return sum;
}
```

b. 

```
int sum2Num( int num1, int num2 );
{
    int sum;

    sum = num1 * num2;
    return    ;
}
```

**3. Find errors in the following function prototypes:**

- a. `int sum (int x, y, z);`
- b. `int sum (int, int, int);`
- c. `int sum (void, int y, int z);`

**4. Considering the following function prototype:**

```
int findMax(int num1, int num2, int num3);
```

Write a function call to find the maximum value among three numbers `inputA`, `inputB` and `1000`.

```
Int inputA, inputB, maxVal;
.....
```

```
maxVal =
```

**5. Sound level is commonly measured in decibels ( dB)**

$$\text{Sound level} = 20 * \log_{10}(sp/rp)$$

where:

$sp$  is a measured sound pressure

$rp$  is a reference pressure (the sensitivity of human ear  $20 * 10^{-6}$  Pa)

Provide a function prototype and its definition that calculates the sound level based on the sound pressure measured. Provide an example of the function call.

6. Write statements that compute and display the absolute difference of two type double variables,  $x$  and  $y$  ( $|x - y|$ ).
7. Write a complete C program that prompts the user for the coordinates of two 3-D points ( $x_1, y_1, z_1$ ) and ( $x_2, y_2, z_2$ ) and displays the distance between them computed using the following formula:

$$\text{distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

8. If an actual argument of  $-35.7$  is passed to a type `int` formal parameter, what will happen? If an actual argument of  $17$  is passed to a type `double` formal parameter, what will happen?
9. Write the prototype for a function called `script` that has three input parameters. The first parameter will be the number of spaces to display at the beginning of a line. The second parameter will be the character to display after the spaces, and the third parameter will be the number of times to display the second parameter on the same line.
10. Write a function that computes the time one must leave in order to reach a certain destination by a designated time. You need to deal only with arrivals occurring later in the same day as the departure. Function inputs include the arrival time as an integer on a 24-hour clock (8:30 P.M. = 2030), the distance to the destination in kilometers, and the speed you plan to average in km/h. The function result should be the required departure time (rounded to the nearest minute) as an integer on a 24-hour clock. Also, write a driver program to test your function.