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- **Exercise2**
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- First
- testsimulator
  - Header Files
  - Important Files
  - Linker Files
  - Source Files
  - Libraries
  - Loadables

Available Resources | Pin Module | System Module | DMA Manager | Interrupt Module | UART2 | main.c

```c
1    #include <stdio.h>
2    #include <stdlib.h>
3    #include <string.h>
4    #include <math.h>
5
6    #include "mcc_generated_files/mcc.h"
7
8    /*
9                             Main application
10   */
11   void main(void)
12   {
13       // Initialize the device
14       SYSTEM_Initialize();
15
16       // Arctan can be summoned by using atanf()
17       float V1, V2, R=1.0, r=2.0, pi=4*atanf(1);
18
19       printf("\n\r\n\r pi is %f",pi);
20
21       V1=4*pi*pow(R,3)/3;
22
23       V2= 4*pi*pow(r,3)/3;
24
25
26       printf("\n\r The volume of a sphere radius 1.0 is: %f",V1);
27       printf("\n\r The volume of a sphere radius 2.0 is: %f",V2);
28
29
30       while (1)
31       {
32           // Add your application code
33       }
```

main

Exercise2 - Dashboard | Navigator | Versions [MCC]

Versions

- MPLAB® Code Configurator (Plugin) v4.0.1
- Libraries
  - Microchip Technology, Inc.
    - Microcontrollers and Peripherals
      - 8-bit AVR MCUs (v2.4.0)
      - MCP19XXX (v1.4.0)
      - PIC10 / PIC12 / PIC16 / PIC18 MCUs (v1.81.6)
      - PIC24 / dsPIC33 / PIC32MM MCUs (v1.169.2)
    - Software
      - 8-bit Bootloader Library
      - 16-bit Bootloader
      - AVR-IoT AWS Sensor Node
      - AVR-IoT Google Sensor Node
      - Board Support Library
      - CryptoAuthLibrary
      - Data Encryption Routines
      - FatFs Library
      - Foundation Services Library (v0.2.2)
      - LIN Library
      - MCP802X
      - motorBench Development Suite
      - MQTT Library

Output | Notifications | Notifications [MCC] | Pin Manager: Grid View

Configuration Loading Error | MPLAB® Code Configurator | Exercise2 (Build, Export Hex)

```
make -f nbproject/Makefile-default.mk SUBPROJECTS= .build-conf
make[1]: Entering directory 'C:/MinGW/msys/1.0/home/manmo/Phys1600/Exercise2.X'
make  -f nbproject/Makefile-default.mk dist/default/production/Exercise2.X.production.hex
make[2]: Entering directory 'C:/MinGW/msys/1.0/home/manmo/Phys1600/Exercise2.X'
make[2]: 'dist/default/production/Exercise2.X.production.hex' is up to date.
make[2]: Leaving directory 'C:/MinGW/msys/1.0/home/manmo/Phys1600/Exercise2.X'
make[1]: Leaving directory 'C:/MinGW/msys/1.0/home/manmo/Phys1600/Exercise2.X'

BUILD SUCCESSFUL (total time: 169ms)
Wrote hex image to "F:\exercise.hex".
```

23:24 | INS

COM4 - PuTTY

```
The volume of a sphere radius 1.0 is: 3.141593The volume of a sphere radius 2.0
is: 25.132741
 The volume of a sphere radius 1.0 is: 3.141593
 The volume of a sphere radius 2.0 is: 25.132741pi is 3.141593
 The volume of a sphere radius 1.0 is: 3.141593
 The volume of a sphere radius 2.0 is: 25.132741


pi is 3.141593
 The volume of a sphere radius 1.0 is: 3.141593
 The volume of a sphere radius 2.0 is: 25.132741


pi is 3.141593
 The volume of a sphere radius 1.0 is: 4.188790
 The volume of a sphere radius 2.0 is: 33.510322
```

Common programming mistake would be multiplying the 4/3 which is not just simple BEDMAS

2.

main.c:21:13: warning: implicit declaration of function 'pow' is invalid in C99 [-Wimplicit-function-declaration]

If you leave the math.h library out then the error shown above occurs. It is because the math functions are unavailable to use and only exist in the math library. The code has already been written for us by someone kind and is available to use as a function for basic math operations.

3.

```c
        float x[]={4.1,4.49, 4.5, 4.51, 4.9, -4.1, -4.49, -4.5, -4.51, -4.9};

        int length= sizeof(x)/sizeof(x[0]);

        float j[10];
        float k[10];
        float l[10];
        float m[10];

    // printf("\n\rthe length of the array is: %d", length);

    // printf("\n\r\n\r the third number is: %g", x[3]);

        for(int i=0;i<length;i++)
        {
            j[i]= x[i];

            k[i]= floorf(x[i]);

            l[i]= ceil(x[i]);

            m[i]= (int)x[i];

            printf("\n\r\n\r %g \t\t  %g \t\t  %g \t\t  %g",j[i],k[i],l[i],m[i]);
        }
        while (1)
        {
            // Add your application code
        }
```

```
-4.51              -5              -4              -4

-4.9               -5              -4              -4

4.18879                 4               5               4

The volume of a sphere radius 1.0 is: 4.188790
The volume of a sphere radius 2.0 is: 33.510322

4.1                4               5               4

4.49               4               5               4

4.5                4               5               4

4.51               4               5               4

4.9                4               5               4

-4.1               -5              -4              -4

-4.49              -5              -4              -4

-4.5               -5              -4              -4

-4.51              -5              -4              -4

-4.9               -5              -4              -4
```