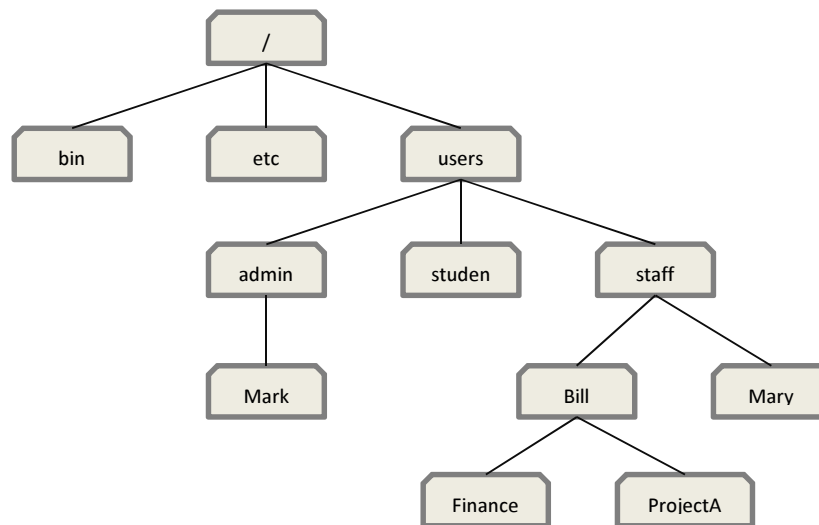# HW #2: C Fundamentals

Due dates:

Part I: Monday Jan 25th, at the beginning of the class. Make sure to write your name and msunetid on your paper.

Part II: Sunday Jan 24th, 11:59 pm through Handin (https://secure.cse.msu.edu/handin)

Part I: Comprehension Questions

1. Consider a file system with the following directory structure. Specify the Unix commands to do the following: (3 pts)

a. Assume that you are in the root directory, change into the directory Finances.
    cd /users/staff/Bill/Finances

b. List all files in Finances
    ls –a

c. View the content of file "todo" in ProjectA (Assume you are now in directory Finances)
    more ../ProjectA/todo

2. What does the compiler do? (2 pts)
    1. Check for syntax errors
    2. Transform the source code into object code if the source code does not contain any compilation errors

3. What is the advantage of using constants? (1 pt)
    1. Reduce code duplication
    2. Avoid mistakes of accidentally changing the value of the constant

4. What is the output of the following program? (2 pts)

```
#include<stdio.h>
int main(void) {
    int x = 3, y = 3;
    x = y;
    y = y - 1;
    x = 2*x + y;
    printf("X = %d, Y = %d\n", x, y);
    return 0;
}
```

The output is:
X = 8, Y = 2

5. Find two errors in the following program (2pts)

```
int main(void) {
    int your-age;
    int myage;
    printf("How old are you?\n");
    scanf("%d", &your-age);
    printf("You are %d years old, ");
    prinf("I am %d years old\n", your-age, myage);
    return 0;
}
```

1. #include<stdio.h> is missing
2. your-age is not a legal identifier
3. The second printf statement does not print the intended age variable (does not generate a compilation error)
4. The third printf statement contains an additional expression that is not printed (does not generate a compilation error)

Part II: Lab Assignment

Getting started

Change into the cse220 directory
Create a new directory called lab02
Change into the new directory
Implement the program below in your lab02 directory

Project Description

You are to write a program that computes the total distance travelled by a moving object based on its initial velocity, its acceleration, and the travel time. Call your program travel.c.
The distance travelled can be computed according to the following formula:

$$distance = acc*time^2/2 + velocity*time$$

where

```
distance:   is the distance travelled meters
acc:        is the acceleration in m/s²
velocity:   is the initial velocity in m/s
time:       is the travel time in seconds
```

Your program should ask the user for the velocity in m/s, the acceleration in m/s² and the time in seconds. Your program should display the output formatted according to the following example:

```
The initial velocity is: 10 m/s
The acceleration is: 2.5 m/s2
The total distance travelled after 20 seconds is: 700 meters
```

To read the user input into a variable, use the scanf function, for example the following code reads the float value entered by the user into variable acc.
```
scanf("%f", &acc);
```

Compile your program and call your output TravelLog.
Test your program by running it 3 times with the following input:

Initial Velocity (m/s)	Acceleration (m/s²)	Time (s)	Expected distance computed
18.5	8.5	20	2070
12.6	2.3	4500	23344200
9	1	3600	6512400

```c
#include<stdio.h>

int main(void) {
   float distance, velocity, acc, time;

   printf("Enter the initial velocity in m/s: ");
   scanf("%f", &velocity);

   printf("Enter the acceleration in m/s2: ");
   scanf("%f", &acc);

   printf("Enter the time in seconds: ");
   scanf("%f", &time);

   distance = acc*time*time/2 + velocity*time;

   printf("The initial velocity is: %f m/s.\n", velocity);
   printf("The acceleration is: %f m/s2.\n", acc);
   printf("The total distance travelled after %f seconds is: %f meters",
       time, distance);

   return 0;

}
```

Handin

Submit through the handin system the following files: travel.c and TravelLog

The "handin" system has options to allow you to review your files online and to download them. You Should always verify that you submitted the correct files and they were received by the handin system. You can submit files as many times as you like for a particular assignment. Handin will only keep the last version of each file. Remember to submit your files prior to the deadline as you won't be able to use handin if the deadline has passed.