

Learning Objectives:

1. Learn new Unix commands: man (manual); tar (archive)
 - a. man tar
 - b. tar xvf lab06.tar (extract)
2. Review key concepts from last few labs:
 - a. Assign values to different types of variables
 - b. Recognize integer division and how to use C-style casting
 - c. Practice using '%' for modulo operation
 - d. Understand order of operations within a calculation
3. Practice using if and if-else statements
4. Continue to practice using one of the Unix text editors (vi, emacs, pico, nano...) to write and edit your programs.

Question 1: Is this legal in C++, if not what's wrong with it?

Declaration:

```
string name1 = "Tyler";  
string name2 = 'Tyler';  
char c1 = 'c';  
char c2 = "c";  
double d1 = "123.234";  
double d2 = 4;  
int i1 = -34.54;  
int i2 = (int) 34.54;  
bool b1 = 0, b2 = 1;  
bool b3 = false;  
bool b4 = true;
```

Answer:

Declaration:	Answer:
string name1 = "Tyler";	Ok
string name2 = 'Tyler';	Cannot have single quoted strings
char c1 = 'c';	Ok
char c2 = "c";	Cannot have string assign to character type
double d1 = "123.234";	String cannot be stored in double
double d2 = 4;	Ok
int i1 = -34.54;	Ok - But double shouldn't be stored in int since the value will be truncated (34 is saved in i.)
int i2 = (int) 34.54;	Ok
bool b1 = 0, b2 = 1;	Ok
bool b3 = false;	Ok
bool b4 = true;	Ok

Question 2: What's the output for a – g below?

```
#include <iostream>
using namespace std;
int main() {

    int x = 5; double y = 3;

    cout << "2a: " << x / 3 << endl;
    cout << "2b: " << 1 / x << endl;
    cout << "2c: " << 1 % x << endl;

    cout << "2d: " << (int)9.73 << endl;
    cout << "2e: " << (double)22 / 7 << endl;
    cout << "2f: " << (double)(22 / 7) << endl;

    cout << "2g: " << y / x << endl;

    return 0;
}
```

Question 3: Consider the following C++ program.

```
#include <iostream>
using namespace std;

int main () {
    int i = 7.5;          double d = 2;

    cout << i / d << endl;           // line a)
    cout << (double) i / d << endl;  // line b)
    cout << i / (int) d << endl;     // line c)
    cout << 7 / 2 << endl;           // line d)
    cout << 15.0 / 4.0 << ' ' << 2.2 + 5 << endl; // line e)
    cout << 5 * 2.0 << endl;         // line f)
    cout << 5 % 3 << endl;           // line g)
    cout << 1 + 4 % 5 * 3 << endl;   // line h)
    return 0;
}
```

State the output at line:

a)	b)	c)	d)
e)	f)	g)	h)

Question 4: Professor Mahavadi's if statements exercises:

1. Write a program that:

- Prompts user to enter an integer number
- Read in user input
- If the number is a multiple of 4, print "The number # is a multiple of 4".
Otherwise, print "The number # is not a multiple of 4"
where # is replaced by the user input

2. Write a program that:

- Get two double variables from the user
- If 1st number is greater than the 2nd, print: "1st number is greater than 2nd number."
- Otherwise, if 1st number is smaller than the 2nd, print: "1st number is smaller than 2nd number."
- Otherwise, print: "Two numbers are equal."

3. Write a program that:

- It asks the user to enter an integer.
- If the entered number is even it divides the number by 2.
- Otherwise the program multiplies the number by 3 and adds 1.
- It prints the result.

Here is an example of how the program should work:

Enter an integer: 5

The answer is: 16