

Handout 3

if and if else

3.1 Tips when using the command line

- Use the command `cp` to make a copy of a pre-existing file. This way you don't have to type in all the top stuff by hand each time. For example:

```
cp old.c new.c
atom new.c
```

- Remember to use the `-lm` option if your code uses functions from the math library. For example

```
gcc mycode.c -lm
```

- Use the up arrows to access previously entered commands. This prevents you from having to type the same thing over and over.
- Use `TAB` to auto-complete commands.

3.2 Quiz

- What does the `fmod` command do?
- What does the `fmax` command do?
- What does the `floor` command do?

3.3 if statements

Type the following code in to a file with the name `if1.c`. What does the code do?

```
/*
first steps with if statements
*/
#include <stdio.h>
#include <math.h>
#include <stdlib.h>

int main()
{
double input1, input2, result;

// get two inputs
printf("Give me two numbers:\n");
scanf("%lf %lf", &input1, &input2);

if (input1 > input2)
    printf("%lf is the larger number \n", input1);

if (input1 < input2)
    printf("%lf is the larger number \n", input2);

if (input1 == input2)
    printf("The numbers are the same \n");

}
```

Use braces if you want to do more than one command per condition.

```
// code snippet

if (input1 == input2)
{
    printf("The numbers are the same \n");
    printf("Why did you give me the same number twice? \n");
}
```

3.4 if else statements

Another way to achieve same result.

```

/*
first steps with if/else statements
*/
#include <stdio.h>
#include <math.h>
#include <stdlib.h>

int main()
{
double input1, input2, result;

// get two inputs
printf("Give me two numbers:\n");
scanf("%lf %lf", &input1, &input2);

if (input1 > input2)
    printf("%lf is the larger number \n", input1);
else if (input1 < input2)
    printf("%lf is the larger number \n", input2);
else
    printf("The numbers are the same \n");
}

```

3.5 Homework: even-or-odd.c

Write a program `even-or-odd.c` that takes in a number and determines whether the number is even, odd, or neither.

3.6 Comparison operators

Here are some useful comparison operators

>	>=	<	<=	==	!=
---	----	---	----	----	----

We can construct larger statements using the AND and OR operators

&&	
----	--

Remember that

- false OR true = true

- false AND [anything] = false

What would be the result of the following?

1. `1 > 2 && 2 <= 3`
2. `1 > 2 || 2 <= 3`
3. `1 <= 2 && 2 != 3`
4. `1 <= 2 || 2 == 3`

3.7 Homework: `order3.c`

Write a program `order3.c` that takes in three numbers and tells you whether the numbers are given in increasing order, decreasing order, or neither. Here is a table with some sample inputs and desired outputs.

input	output
1 2 3	increasing
3 2 1	decreasing
3 1 2	neither
1 1 4	increasing
2 2 2	same

Test out your program with the following commands

```
gcc order3.c -o order3
./order3 <<< "1 2 3"
./order3 <<< "3 2 1"
./order3 <<< "3 1 2"
```

etc.

3.8 Homework: `compare-dates.c`

Modify the following code to obtain a program `compare-dates.c` that determines which of two dates comes earlier. (You can assume that legitimate dates are given.)

```
/*
determines which of two dates is earlier
*/
#include <stdio.h>
#include <math.h>
#include <stdlib.h>

int main()
{
    double month1, month2, day1, day2, year1, year2;

    // get inputs
    printf("Give me the first date in format MM DD YYYY: \n");
    scanf("%lf %lf %lf", &month1, &day1, &year1);
    printf("Give me the second date in format MM DD YYYY: \n");
    scanf("%lf %lf %lf", &month2, &day2, &year2);

    // first compare years
    if (year1 != year2)
    {
        printf("I will compare using years \n");
    }
    // then compare months
    else if (month1 != month2)
    {
        printf("I will determine using months \n");
    }
    // then compare days
    else
    {
        printf("I will compare using days \n");
    }
}
```

Turn in your code here: <https://www.dropbox.com/request/1hLqEGi4z3YPhGMTDL3a>

3.9 Homework: `age1.c`

Write a program `age1.c` that take in a person's birthday in MM DD YYYY format and also takes in todays date in MM DD YYYY format. The program then tells us how old the person is.

3.10 Lab: `quadratic.c`

Write a program `quadratic.c` that takes in the numbers abc and returns the solutions to the quadratic equation

$$ax^2 + bx + c = 0.$$

Your program must be able to handle the special cases.

Input will be in the format `a b c`.

Your program will be graded both on how well it functions and on how organized your code is. Please be sure to include comments in your code!

Turn in your lab at this link:

<https://www.dropbox.com/request/iYsFOcl0TjWxtuft81ax>

3.11 Optional Challenge

Write a program that takes in two dates (in `MM/DD/YYYY`) format and computes how many days apart the dates are.