Fundamentals of Computing: Lecture 3

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Getting started

You need to first creat a file using the editor. Use one of vi/emacs.
The Lab TA will tell you how to use the editor.

Algorithm to creating a file and execute

1. Open the file with the editor

        $ emacs foo.c

2. Edit the program save and exit.
3. Compile the program

        $ gcc foo.c

4. If there are errors go to step 2
5. Run the program

        $ ./a.out

The first C program

```c
#include<stdio.h>

int main()
{
  printf("The answer is 42")
}
```

Variables

```
#include <stdio.h>

int main()
{
  int answer = 41;
  printf("The answer is %d",answer);
  answer = answer  + 1;
  printf("The answer is %d",answer);
}
```

Rule for variable names
A variable name can start with any letter and contain any letter
digit. The symbol '_' is treated as a letter.
eg x123, _x123
non examples 23x

Basic types

1. Integers

   ```
   int   i = 100;
   ```

2. Character

   ```
   char  c = 'a';
   ```

3. Floting point numbers

   ```
   float f = 1.234;
   ```

Expression

- Usual aritmetic expressions.
  eg x + y * 3
- Relational expressions

  x <= 15
- Boolean (truth) expressions

  (x <= 10) || (y < 100) && (10 > 100)

  Here the operator || denotes a logical OR function and && denote logical AND function.

Important point

C does not have Boolean (or truth) type. Integers, characters, etc are treated like boolean. Zero is treated as False and non-zero as True.

Operator Precedence

What does 2 + 3*6 > 5 && 5 < 2 mean ?

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Precedence rules among different kinds of operators

- ▶ Arithmetic has highest
- ▶ then comes relational.
- ▶ then comes boolean.

Among arithmetic operators

- ▶ * and / have more precedence than + and −.
- ▶ Unary operator has more precedence than binary.

Factorial program

```c
# include<stdio.h>

int main(){
   int n = 100;
   int i = 1;
   int fact = 1;
   while(i <= n)
   {
      fact = fact * i;
      i = i + 1;
   }
   printf("The factorial of %d is %d", n , fact);
}
```