

C++

SWE315

Lesson 2

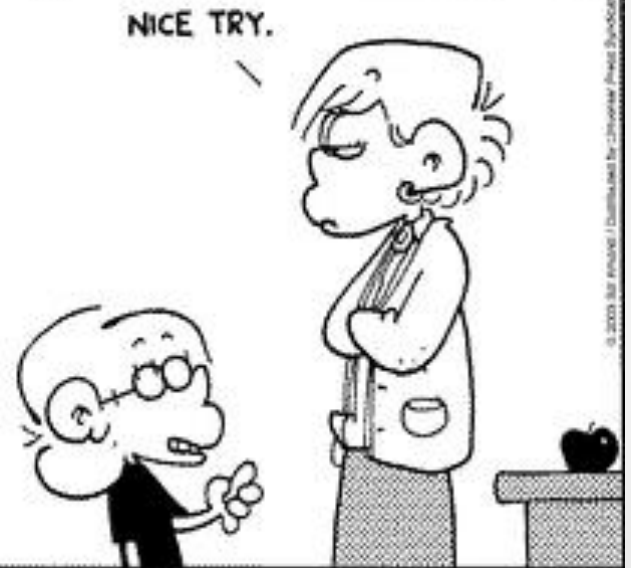
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```
#include <stdio.h>
int main(void)
{
    int count;

    for (count = 1; count <= 500; count++)
        printf("I will not throw paper airplanes in class.");
    return 0;
}
```

AMEND 10-3



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Lesson 2

- In this lesson:
 - Variables
 - Constants
 - Program control (very little!)
 - Loops (even less..)
 - Programs:
 - Char->ASCII->int
 - File I/O
 - Farmer buys horses
 - Homework 2
 - Lab work

Types

- Only handful of generic types
- Character:
 - **Char** – 1 Byte
 - 'A' – Character constant !
- Integer :
 - **int**
 - W/ possible prefix signed/unsigned
 - short int ; long int ; long long int
- Float:
 - float
 - **double** ; long double
- Boolean:
 - **bool** : true, false are RESERVED words in CPP. Also, keeps the C notation: 0-false ; otherwise-true.
- **void** ; nullptr (Null Pointer)

Variables (cont.)

- Declaration
 - `int a,b ;`
- Initialization
 - `int a=5, b=3;`
 - `bool found = false;`
 - `bool notfound = 1;`
- Compound types. (Arrays, structures, unions)
- User defined types (like Strings). Classes.

Constants

- `#define INT_MAX 32767`

Or

- `const int INT_MAX = 32767;`

- One is pre-processor directive
- The other is compiler/linker command

- `#define` is a 'C' lang relic.
- Advantages of 'const':
 - Specific type --> enables type check
 - Scoping rules
 - (in C++ can be used for array size initialization)

cin sees 'everything' as sequence of chars

- Input line is **38.5 19.2**
- **char ch; cin >> ch;**
 - Will read one character '3'. Puts code for '3' in ch ==> int 51.
- **int n; cin >> n;**
 - cin reads up to the first non-digit character. ==> n = 38
- **double x; cin >> x;**
 - cin reads until the first character that's not a part of floating point number. That is, up to the space in our case. ==> x = 38.5
- And how to read a full line in C++ ?
 - <http://www.cplusplus.com/reference/string/string/getline/>

getline()

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

int main()
{
    // reading a whole-line in c++
    string name;

    cout << "Please, enter your full name: ";
    getline(cin, name);
    cout << "Hello, " << name << "!\\n";

    return 0;
}
```


File I/O

- Include the **<fstream>** header file.
- Create an **ofstream** / **ifstream** object.
- Associate stream to **file**.

- Use the stream the same way you would use **cin** / **cout**.

- (This is not a mystery: **cin** / **cout** are simply two special pre-defined streams defined in **<iostream>**)
- (there are also **cerr** and **clog**)

Program Control

- If/Else
 - Logical operators
- While()
- For(int ii=1 ; ii<Rows ; ++ii)

- Later: Switch/case, do, and more.

END