

## Your very first C++ program!

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

int main()
{
    cout << "Hello everyone!" << endl;

    return 0;
}
```

used for all of our c++ programs

main is a function. all programs should have int main().  
Stuff to do should go inside here.

cout << tells us to output to the screen something. It could be  
a number, a variable, or words in quotes.

**endl;** gives us a new line. All lines in C++  
must end with a semicolon!

tells us to exit the program safely  
("press any key to continue")

## Working with variables

```
int num1;  
float num2;  
double num3;
```

int: no digits after decimal point  
float: regular decimals  
double: BIG decimals

- creates 3 number variables named num1, num2, and num3.

Variables cannot be any "reserved words" like "double" or "int". They cannot have any special characters in them. Capital letters make a difference! Here, we will use lowercase letters. Make sure you use good variable names.

ex: using *int dollars* instead of *int stuff*

## Input and Output

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

```
int main()
{
```

```
    cout << "How old are you?" << endl;
```

```
    int age;
```

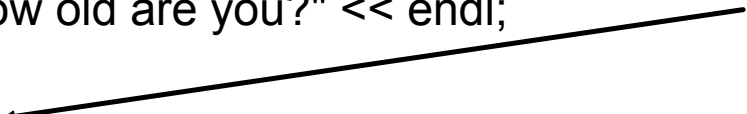
```
    cin >> age;
```

```
    cout << "Wow, you are " << age << " years old!" << endl;
```

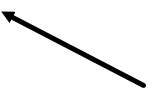
```
    return 0;
```

```
}
```

use **cin >>** to get a variable from the user.



you can now output that variable in your text!




## Math Operations

```
int num1 = 9;  
int num2 = 3;  
int sum;
```

Multiply: \*  
Divide: /

```
sum = num1+num2;
```

**9 % 3**  "Modulus"; gives us the remainder of 9 divided by 3.

## Use doubles or floats for division!!

(Pow, sqrt, sin available if you put `#include<cmath>` at the top.)

## If-Else Statements

```
...
int main()
{
    cout << "How old are you?" << endl;
    int age;
    cin >> age;
    if(age > 30)
    {
        cout << "you're too old" << endl;
    }
    else if(age == 24) ←———— use double equals to check
    {                               if something is equal.
        cout << "Hey Mr. B!" << endl; Do not use a single equals
    }                               sign!!
    else
    {
        cout << "Youngun!" << endl;
    }

    return 0;
}
```

## While Loops and For Loops

```
int n = 1;
while(n < 10)
{
    cout << "Hi " << endl;
    n++;
}
```

← do this stuff as long as this condition is met.

Hi will be printed 9 times!

↙ increase n by one.  $n = n + 1$

```
for(int i = 0; i < 10; i++)
{
}
}
```

Same thing, just in shorthand (one line)  
First section: initial value  
Second section: condition  
Third section: what to do when you're done.

## Individual letters vs. words

### **letters:**

char c;

### **words:**

string myword;

must include `#include <string>`



## Working with Files

```
ifstream fin;
ofstream fout;

char data;

fin.open("stuff.txt");
if(fin.fail())
{
    cout << "Failed to open input file" << endl;
}
else
{
    fin >> data;
    while (!fin.eof( ))    //if not at end of file, continue reading numbers
    {
        cout<< data;    //print individual characters to screen
        fin >> data;    //get next number from file
    }
    fin.close( );
}
```

—————→ need to #include <fstream> at the top

—————→ Right click resource files, add, utility, text file.



```
int num1;
string name;
int num2;

while (!fin.eof( ))
{
    fin >> num1 >> name >> num2;
}
fin.close( );
```

**Sample text file:**

3  
John  
42

## Advanced: Vectors

```
#include <vector>
```

```
vector<int> v;
```

```
for(int i=0;i<10;i++)  
{
```

```
    v.push_back(i);  
    cout << v[i];  
}
```

vectors can grow and shrink  
using push\_back and pop\_back.

You can refer to any part of a  
vector with v[4]. Vectors start  
counting at index 0.

## **Coke Machine**

Write a program that presents the user w/ a choice of your 5 favorite beverages (Coke, Water, Sprite, ... , Whatever).

Then allow the user to choose a beverage by entering a number 1-5.

Output which beverage they chose. (snarky saying optional)

If your program uses if statements instead of a switch statement, modify it to use a switch statement.

If instead your program uses a switch statement, modify it to use if/else-if statements.

Modify the program so that if the user enters a choice other than 1-5 then it will output "Error. choice was not valid, here is your money back."