Your very first C++ program!

used for all of our c++ programs

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

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

    return 0;
}
```

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;

sum = num1+num2;
```

Multiply: *
Divide: /

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)
	{
		cout << "Hey Mr. B!" << endl;
	}
	else
	{
		cout << "Youngun!" << endl;
	}

	return 0;
}
```

use double equals to check if something is equal. Do not use a single equals sign!!

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;

must include #include <string>

words:

string myword;

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."