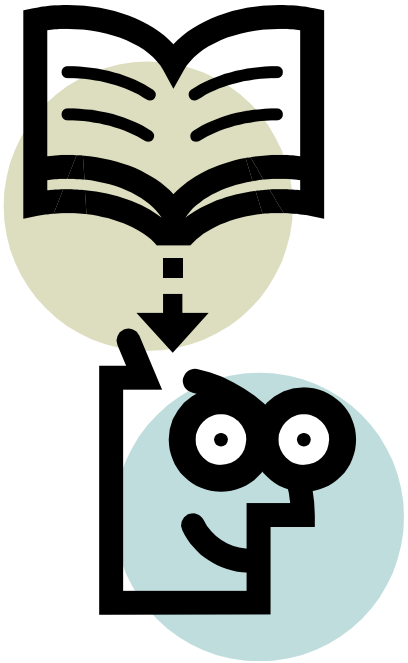
# My first program

and how I created it!

# First: Analyze (read and understand) problem description

"You have just been told that you doubled your investments, how would you calculate your new fortune?



# Second: Develop the solution (write the algorithm)

Outline, using pseudocode, the steps needed to be taken to solve the problem like you would write a recipe.

1) Get input data
2) Process data
3) Display result on the screen

Work on the blueprints first

# More detailed algorithm

1) Get input data (from the keyboard)

a. Get the number that represents the amount of money invested

2) Process data

a. Multiply the number by 2 and keep the result (new amount)

3) Display result on the screen

a. Show the amount invested

b. Show the new amount

# More detailed algorithm

1) Get input data (from the keyboard)

a. Declare a variable to hold the value (int)

b. Prompt the user to enter the number (cout)

c. Get the number from the keyboard and store it in the variable (cin)

2) Process data (multiply the number by 2)

a. Declare a variable to store the result (int)

b. Multiply the number by 2 and store the result in its variable

3) Display result on the screen

a. Show the number read from the keyboard (echo printing)

b. Show the result

# Reorganizing the steps

0) Declare “the stuff“ to be used in the program
1) Get input data
2) Process data
3) Display result on the screen

# The complete algorithm

0) Declare “the stuff” to be used in the program

a. Declare a variable to hold the value (int)

b. Declare a variable to store the result (int)

1) Get input data (the number) from the keyboard

a. Prompt the user to enter the number (cout)

b. Get the number from the keyboard and store it in the variable (cin)

2) Process data (multiply the number by 2)

a. Multiply the number by 2 and store the result in its variable (=)

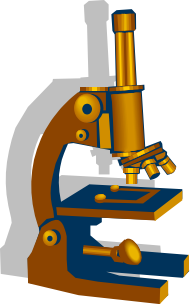
3) Display result on the screen

a. Show the number read from the keyboard (cout)

b. Show the result (cout)

# Third: Implement the algorithm (write the program, i.e., source code)

1) Declare needed preprocessor directives
   (#include)
2) Enter heading of the program ( int main() )
3) Enter the statements in the body of the program
   ({ …. return 0;}

# Upper half of the source code

```
#include <iostream>    // to be able to use cin and cout
using namespace std; // declaration of the identifiers from iostream

int main()                    // heading of the program
{                             // beginning of the body

// Declare "the stuff" to be used in the program

    int number; // number will hold the value read from the keyboard
    int result;    // result will hold the result of multiplying number by 2

// Get input data (the number) from the keyboard

    cout << "Please enter a whole number: " ; // prompt the user to
                                              // enter the number
    cin >> number;                  // get the number from the keyboard
                                    // and store it in the variable
```

# Lower half of the source code

```
// Process data (multiply the number by 2)

    result = number * 2;      // multiply the number by 2 and store result
                              // in its variable

// Display result on the screen

    cout << “The result of multiplying “ << number << “by 2 is:  ”; // show
                                  // the number read from the keyboard
    cout << result;               // show the result

    return 0;                     // finished succesfully
}                                 // end of the body
```

# Finally: test the program thoroughly

- Test your program with different **valid** input values and analyze the outputs to ensure it is producing the expected results.
- Test your program with **invalid** entries and see how it reacts.
- If necessary go back to the first step and make changes to the algorithm, make the necessary code changes, and test it again.

Good Job!!!
Let’s start coding!

```
////////////////////////////////////////////////////////////////////////
//
//
// Program Description: Start with a buggy program and fix it
//
////////////////////////////////////////////////////////////////////////

#include<iostream>
using namespace std;

int main()
{
    // Declare a variable that can hold real numbers
    double x;
    // Solve an expression and assign the result to the variable
    x = 1 / 2 * 9;
    // Show the result on the screen
    cout << Hello :-) << endl << endl;
    cout << "The value in x is: " << x << endl << endl;
    cout << endl
    return 0;
}
```