# Assignment Description

In module 1, you wrote a program to convert 5-digit numbers from binary to decimal.  In this assignment, you will expand on that program so that it can calculate binary numbers of unlimited size. Prompt the user for 1s and 0s until they enter a -1.  For each digit entered of the binary number, perform the part of the conversion that number represents (you will need to keep track of which digit position you are currently converting). After the user enters -1, display the converted binary number.

# GitHub URL (optional)

[https://github.com/wesleyhixon/Programming-Assignments/tree/db13555674b59a71774b2797c9ec87af6b7d306f/M04%20Programming%20Assignment%202](https://github.com/wesleyhixon/Programming-Assignments/tree/db13555674b59a71774b2797c9ec87af6b7d306f/M04 Programming Assignment 2)

# Readme Documentation

Input Information:Input is a series of binary 1s and 0s, followed by a -1 to break input

Output Information: Output is the binary number converted to decimal

# Flowchart Screen Shots (optional)

Screen shot(s) here

# UML and Use Case Diagrams (optional)

Screen shot(s) here

# Source Code of All files (.h, .cpp)

1 #include *<iostream>*

2 #include *<math.h>*

3

4 **using** **namespace** **std**;

5

6 */\**

7 *Program Name: Binary Number Converter 2.0*

8 *Author: Wesley Hixon*

9 *Date Last Updated: 06/25/2024*

10 *Purpose: Convert a binary number of any length into decimal*

11 *\*/*

12

13 int main(){

14 int userInput, digitPosition = 0, decimalNum = 0;

15 cout << "Welcome to the binary number converter 2.0." << endl;

16 cout << "You will enter a binary number 1 digit at a time starting at the right and the program will convert the number to decimal." << endl;

17

18 **while**(userInput != -1){

19 bool valid = false;

20 *// This loop prompts for input until the input is determined to be valid.*

21 **while**(!valid){

22

23 *// There are different prompt cases because of 1st, 2nd, 3rd, etc.*

24 **switch**(digitPosition){

25 **case** 0:

26 cout << "Enter the 1st binary digit (Enter -1 to complete the conversion): ";

27 **break**;

28 **case** 1:

29 cout << "Enter the 2nd binary digit (Enter -1 to complete the conversion): ";

30 **break**;

31 **case** 2:

32 cout << "Enter the 3rd binary digit (Enter -1 to complete the conversion): ";

33 **break**;

34 **default**:

35 cout << "Enter the " << digitPosition + 1 << "th binary digit (Enter -1 to complete the conversion): ";

36 **break**;

37 }

38 cin >> userInput;

39 cout << endl;

40 *// If input fails, clear input errors and ignore rest of input.*

41 **if**(cin.fail()){

42 cout << "You have entered something that is not a number. Try again." << endl;

43 cin.clear();

44 cin.ignore(100000, '\n');

45 }

46 *// If input is valid, break the loop.*

47 **else** **if**(userInput == 1 || userInput == 0 || userInput == -1){

48 valid = true;

49 }

50 *// Otherwise, try again.*

51 **else**{

52 cout << "Binary digit can only be a 1 or 0. Try again." << endl;

53 }

54 }

55

56 **if**(userInput == 1){

57 *// Calculate the decimal value of a binary 1 using 2 raised to the power of the digitPosition*

58 *// And add it to the decimalNum*

59 decimalNum += pow(2, digitPosition);

60 }

61

62 *// Then, increment digitPosition*

63 digitPosition++;

64 }

65

66 *// Once loop breaks, output final decimal number*

67 cout << "Your number in decimal is " << decimalNum << endl;

68

69 **return** 0;

70 }

71

# Three Use Case Screen Shots

The can all be in a single screen shot





