

Converting Decimal number to Binary and Binary to Decimal

Requirement Analysis (4W & H)

What-Converting a number written in binary to a number system with another base like decimal and also converting a decimal number to a binary.

Where-Then **binary numbers** are commonly **used** in digital and computer circuits and are represented by either a logic “0” or a logic “1”. **Binary** numbering systems are best suited to the digital signal coding of **binary**, as it **uses** only two digits, one and zero, to form different figures.

Why-We use converter because Computers use Binary and they can only read and store an on or off charge. To keep calculations simple and convert into binary online, computer use the Binary system.

When- The digits: 0 and 1, are used by binary code to represent computer text or instructions and a bit string is assigned to each symbol or instruction.

How- To convert **decimal** from **binary** it will start with the number and divide it by 2 and then it will give of the quotient and the remainder. Continue dividing the quotient by 2 until you get a quotient of zero. Then just write out the remainders in the reverse order.

And in **binary** to **decimal** it will start from leftmost digit from the input. From **binary** number Starting from the left, double the previous total and add the current digit. Double the current total and add the next leftmost digit then it will convert into **decimal**.

History:

The modern binary number system, the basis for binary code, was invented by **Gottfried Leibniz** in 1689 and appears in his article *Explication de l'Arithmétique Binaire*. The full title is translated into English as the "Explanation of the binary arithmetic", which uses only the characters 1 and 0, with some remarks on its usefulness.

Uses:

It could be used in a primitive calculating machine, most modern computers use binary encoding for instructions and data. Telephone calls are carried digitally on long-distance and mobile phone networks using **pulse code modulation** on voice over **IP network**.

Feasibility Study

1. Technical Feasibility

Number Conversion System is a tool used for converting a decimal number to its respective binary number and vice versa. The main technology and tools that are associated with Number Conversion System are

2.1 C Programming

2.2 Visual Code Studio

The above requirements are freely available and skills required for this are manageable. Time limit limitations of the product development and the ease of implementing using these technologies are synchronized.

From the above statements it is clear that the project Number Conversion System is technically feasible.

2. Operational Feasibility

This project provides a very user friendly way to interact with the customer. Any user who does not have any understanding of programming technologies can also use this. We have allowed users to give text based inputs so that they can easily use this tool and this makes it more user friendly. Even normal people who are not familiar with technology can also use this application and perform the operations defined by us.

It is clear from the above explanation that the project is operationally feasible. Technical Feasibility

3. Resource Feasibility

Resources that are required for Number Conversion System includes

3.1 Programming Devices (Laptops)

3.2 Code Editors

3.3 Programming individuals

The above mentioned resources are easily available and hence it is clear that the project is resource feasible.

4. Financial Feasibility

Being a Number Conversion System tool it will not require any type of hosting. Since it is not operable via internet hence it doesn't require bandwidth and internet usage.

Bug fixing and maintaining tasks will have an associated cost. At the initial stage the potential market place will be some secondary and high schools. Later on market place will be expanded to colleges and local public.

Significantly it will reduce the efforts made by people to solve such kind of conversion problems as the conversion will be input based and fully automated.

From these points it is clear that project Number Conversion System is financially feasible.

SWOT Analysis

Strengths:

- Easy to implement conversions.
- Binary coded decimals take as many bits as it requires.

Weakness:

- Float point conversions cannot be done.
- Calculations with these binary numbers are more complex.
- The major disadvantage of binary number is difficult to read and write for humans because of large number of binary for equivalent decimal number.

Opportunities:

- Binary coded decimal system is used all over the worlds computing systems.
- Binary coded decimal system provides a safety range for reliability.

Threats:

- Binary system may become obsolete in future.
- Binary and decimal systems are not used because of their complexities in their calculation.

REQUIREMNETS

High Level Requirements:

- 1) System Requirement: User takes input from the console to calculate conversions from decimal to binary and binary to decimal to give output to the user.

- 2) User Requirement: User wants a binary number to convert that number to decimal number. And also user wants a decimal number to convert that number to binary number.
- 3) Business Requirements: This is used for students to perform calculations in less time.

Low Level Requirements:

- 1) Software Requirements:
 - Operating System: windows10
 - Coding language: c language
- 2) Hardware Requirements:
 - Processor: core i3
 - RAM:4GB

Test Cases

Positive Test Cases

For Binary conversion:

If user inputs 10 then the output will be 1010.

For Decimal Conversion:

If user inputs 0001 then the output will be 1.

Negative Test Cases

1. No special characters are allowed as input for the conversion
2. No Negative values are allowed in input.
3. If user enters a value apart from the menu given it is going to exit with a code 0.
4. If a value other than binary and decimal is entered, it will throw an error.