Sri Lanka Institute of Advanced Technological Education.
Higher National Diploma In Information Technology.

Individual Project Proposal

"binary,octal,decimal,hexadecimal base number converter system"

By

Name   : K.K.V.Rathnayake
 Register Number   : ANU/IT/2021/F/17

Supervisor

Mr. Pavirindu Sahansith

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Introduction

This project proposal is submitted" to meet the software development requirements of the Individual Project module conducted by the "Advanced Technological Institute" of Anuradhapura.

In this project, when the user enters an input and selects the base to be converted and clicks the convert button, it will be converted into the corresponding base.Also, from this project, the values and solutions entered by the user can be obtained. Also, random questions and solutions can be obtained.

I present a base converter system in this project.What is the base number? A number base is the number of digits or combination of digits that a system of counting uses to represent numbers. A base can be any whole number greater than 0. The most commonly used number system is the decimal system, commonly known as base.[1] I used these binary,octal, decimal, hexadecimal bases for my system.

A Binary number system has only two digits that are 0 and 1. Every number (value) represents 0 and 1 in this number system. The base of the binary number system is 2, because it has only two digits.Octal number system has only eight (8) digits from 0 to 7. Every number (value) represents 0,1,2,3,4,5,6 and 7 in this number system. Decimal number system has only ten (10) digits from 0 to 9. Every number (value) represents 0,1,2,3,4,5,6, 7,8 and 9 in this number system. A Hexadecimal number system has sixteen (16) alphanumeric values from 0 to 9 and A to F. Every number (value) represents with 0,1,2,3,4,5,6, 7,8,9,A,B,C,D,E and F in this number system.

This system can convert a base value to another base value.the purpose of creating such a system is to easily and quickly convert a base value to another base value.

Background

The system I chose is mostly used as a web application.there are many web application.A lot of those applications are mostly the same.so i found there different web applications.their details are given below.

First one is rapid tables website.this website has both base calculator and base converter.first let's look at the base converter.you can convert to 36 bases on this website.also below is how to create the answer we received when an output comes from the bottom of this website.you can swap the bases on this website.[2]

Now let's look at the base calculator provided by this website.we can calculate to 36 bases.now let's look at the second website.it called inch calculator.you can convert to 36 bases on this website.this website also shows how the problem was solved along with the output.this website also has a base calculator as described above.here the output looks like different.[3]

Let's look at the last website.it is called coders tool box.we can only convert to Binary (base 2), Octal (base 8),Decimal (base 10),Hex (base 16).the specialty of this site is that when we add a number to one base,it automatically turns to other bases at once.[4]

Second let's look at a **stand alone application**.i found one stand alone application.
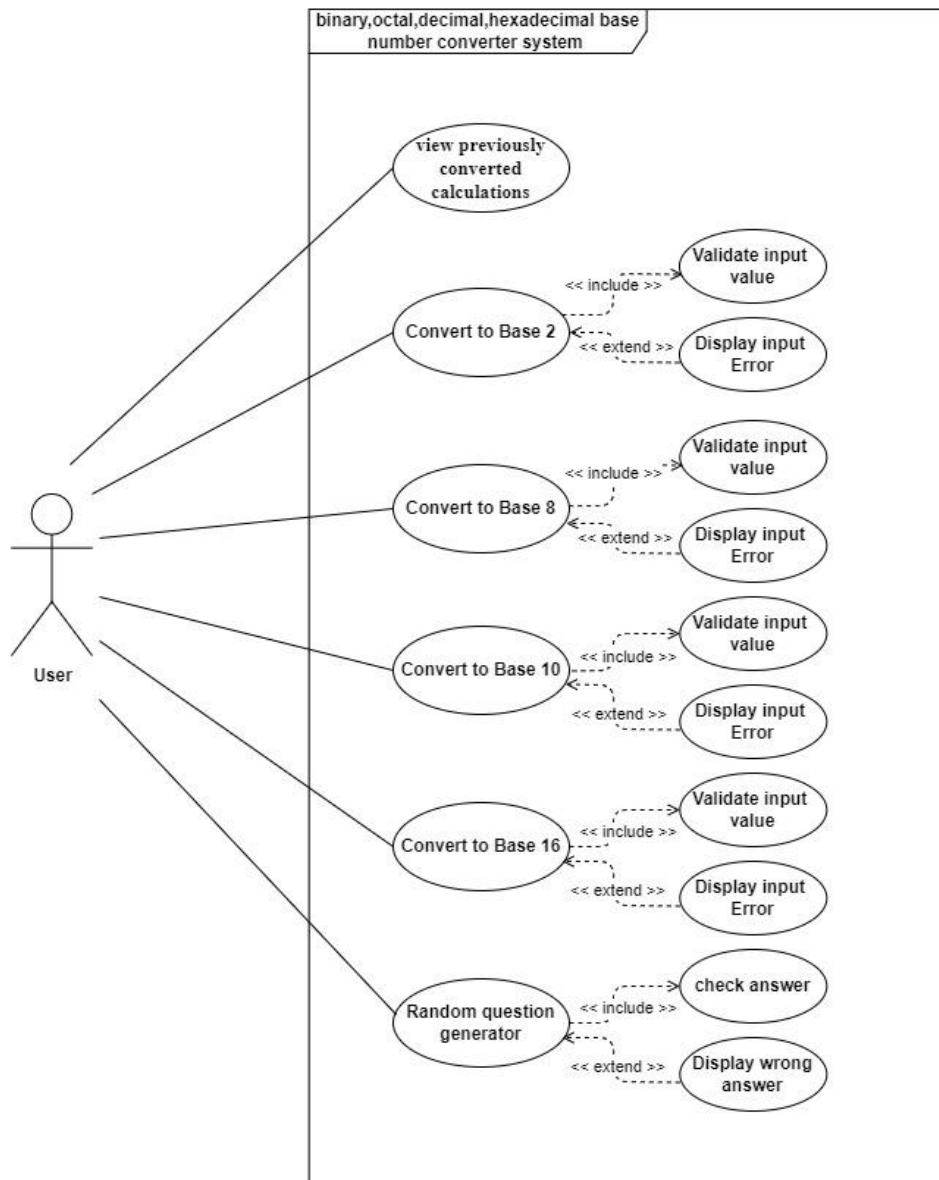
1. Quick Number Base Converter

Let's look at the software. it is called Quick Number Base Converter.we can convert to Binary (base 2), Octal (base 8),Decimal (base 10),Hex (base 16).this software is that when we add a number to one base,it automatically turns to other bases at once.the specialty of this software it can be converted as an ascii number.[5]

Third, let's look at a **mobile application.**I found one mobile application.

1. Base Converter

You can convert to 36 bases on this mobile application.This mobile application is that when we add a number to one base,it automatically turns to other bases at once.[6]

Use case diagram -

binary,octal,decimal,hexadecimal base number converter system

- view previously converted calculations
- Convert to Base 2
  - << include >> Validate input value
  - << extend >> Display input Error
- Convert to Base 8
  - << include >> Validate input value
  - << extend >> Display input Error
- Convert to Base 10
  - << include >> Validate input value
  - << extend >> Display input Error
- Convert to Base 16
  - << include >> Validate input value
  - << extend >> Display input Error
- Random question generator
  - << include >> check answer
  - << extend >> Display wrong answer

User

Preliminary Investigation

Most of the available methods are web applications.system application is less.in this website showing in ads is a hindrance to the conversion process. It is a nuisance to the user. and The cost of data charge is high.if the data runs out while the number conversion process is in progress,the process cannot continue without the data.

There is no history tab in the web application.As a web application,it is essential to always be connected to the internet.These can be described as the deficiency of the web application.

Aims and Objectives

The aim of my project is to develop a system for converting base numbers quickly, easily and increase the accuracy of the answer.

Objectives of the project
- A number in base 2 must be converted to base 8,base 10 and base 16
- A number in base 8 must be converted to base 2,base 10 and base 16
- A number in base 10 must be converted to base 2,base 8 and base 16
- A number in base 16 must be converted to base 2,base 8 and base 10
- The user should be able to view previously converted calculations.
- This random question generator and showing answers include this system.

Proposed Solution

The main problem with the system mentioned above is that it is a web application.web application must have internet.as a solution to this,i am creating this application as a standalone application.(no internet access).

I have decided to make this project using c# language.i hope to add some features to this system that were not in the previous systems.i will be included to view previously converted calculations and random question generator features added to my project.

After entering the answer to the question given to the user in the random question generator and clicking the generate answer button, if the answer is correct it will be shown as correct and if the answer is incorrect it will be shown as incorrect.

The previously converted calculations include the input value entered by the user and the input base entered,the base the user outputs,and the answer received after the user outputs.i want to create a user interface of my system as per below diagram.
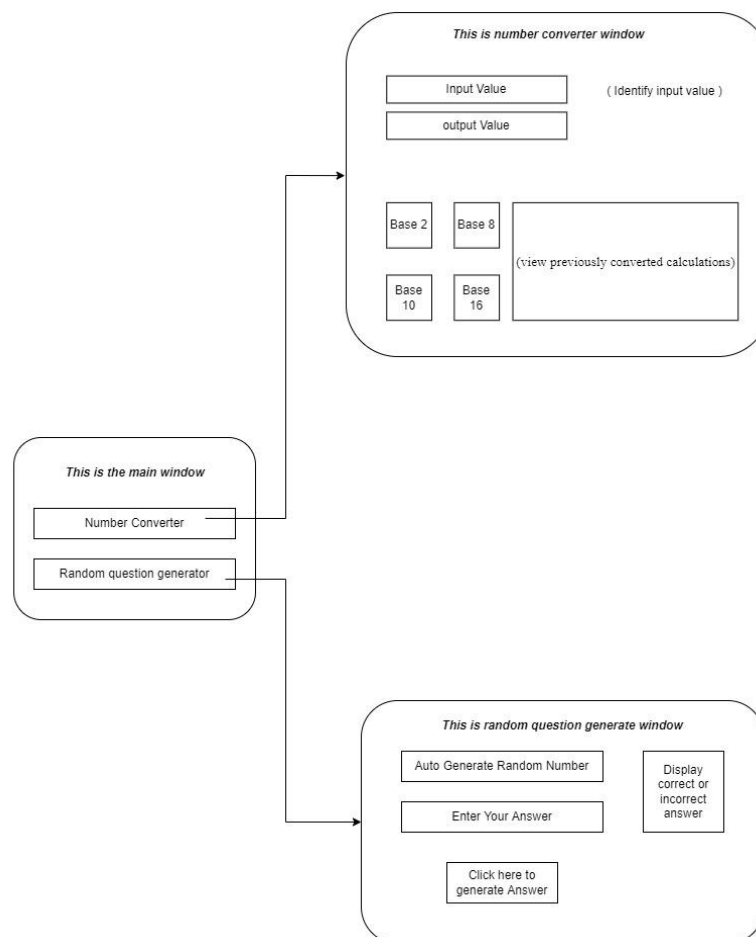
Feasibility study

Below are the resources I used to complete the project.

- Technical Feasibility

    1. Hardware resources
        - Using computer
        - Using wifi router
    2. Software resources
        - Using Visual Studio
        - Pdf reader
        - Web browser

- Economic Feasibility

    Pay per human hourly rate = Rs. 222.23

    Hours worked per day = 4 hour

    Hours worked per month = 4 hour * 30 days
                                          = 120 hour

    Number of months worked = 120 hour * 6 months
                                               = 720 hour
    Total = 730 hour * 222.23
            = Rs. 167,227.9

Gantt chart

Activities	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Introduction	■													
Read Project Proposal		■												
Project planning			■	■										
Data Collection					■	■								
Enter Data in To Computer							■	■						
Project Report									■	■	■	■		
Complete Project													■	■

References

[1]   "7.2: Number Bases," *Mathematics LibreTexts*, Mar. 16, 2018.
https://math.libretexts.org/Courses/Mount_Royal_University/MATH_2150%3A_Higher_Arithmetic/7%3A_Number
_systems/7.2%3A_Number_Bases#:~:text=Definition%3A (accessed Oct. 05, 2022).

[2]   "Base calculator | math calculators," *www.rapidtables.com*.
https://www.rapidtables.com/calc/math/base-calculator.htm (accessed Oct. 08, 2022).

[3]   "Base Converter - Convert a Number to Any Base," *Inch Calculator*.
https://www.inchcalculator.com/base-converter/ (accessed Oct. 08, 2022).

[4]   "Number converter - hex, octal, binary | Coder's Toolbox," *coderstoolbox.net*.
https://coderstoolbox.net/number/ (accessed Oct. 08, 2022).

[5]   "Quick Number Base Converter. Get the software safely and easily.," *Software Informer*.
https://quick-number-base-converter.software.informer.com (accessed Oct. 08, 2022).

[6]   "Base Converter - Apps on Google Play," *play.google.com*.
https://play.google.com/store/apps/details?id=com.universapp.baseconverter (accessed Oct. 08, 2022).