Number System Converter With Big Numbers Handling Mini Project

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Intro:

This is a number system converter program with big numbers handling. normally, a biggest value c++ can handle is **-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807**, can be stored in ***long long int*** variable, So if someone provides big numbers than this, c++ can't even add 1 to it, so how it will convert that much big numbers.
1 digit in decimal = 4 digits of binary, so how c++ will handle that much big number, my program is 600 lines, out of which less than 150 are number system converter functions, remaining are some other functions, which I myself made, to perform arithmetic operations on any biggest number a person can imagine, if you remove those lines, my program will only convert upto a range, if you want to convert any biggest number which c++ can't handle normally, than those functions are useful. Which I myself have made, There is nothing on internet, you can try to find.
It also stores conversions in a history.txt file and It has some exceptions handling code.

Which concepts of Object Oriented Programming are used in it?

Ans: Classes, Objects, Inheritance, Abstraction, Encapsulation, File Handling, Exception Handling,

Working:

So it has two classes, one is BigNumbersArithematic Class, which has some funtions to handle big numbers, and other one is Number_System Class which is derived from BigNumbersArithematic, so it has access to big numbers handling functions and also it has access to its own actual number converter functions which are its member functions, I will explain about functions of both classes that what they do, I won't explain how they do that, because that code has machine learning concepts, algorithms and more so it can't be easily explained on a piece of paper.

How I manage to handle big numbers?

Ans:I take numbers input and store them in Strings, they doesn't have range, then I have functions, which takes those strings and perform operations on them, they don't handle whole string at a time, they divide that string in parts and one by one they perform operations and then join them, so this is in simple words the answer how I manage to handle big numbers.

Functions in my program are divided in three different groups. One are in Number_System class, those which performs conversions, second are extra functions which doesn't belong to any class, and last are in BigNumbersArithematic class those which performs arithmetic operations on big numbers, which are provided by user on runtime.

1. BigNumbersArithematic Class Mmeber Functions

string_divisor() → This function takes two strings, and divides them and returns quotient.
string_remainder() → This function takes two strings, and divides them and returns remainder.
string_multiplication() → This function takes two strings, and multiplies them and returns product.
string_plus() → This function takes two strings, and add them and returns addition.
string_minus() → This function takes two strings, and subtract them and returns subtraction.
string_power() → This function takes two strings, first one is base and second is exponent, and returns power of base.
string_max() → This function takes two strings, and find greater amongst them.
string_trimmer() → This function takes a string, and remove leading zeros from it.

2. Number_System Class Member Functions

dtob() →This function takes a Decimal number as a string, and convert it to Binary.
dtoh() →This function takes a Decimal number as a string, and convert it to Hexadecimal.
dtoo() →This function takes a Decimal number as a string, and convert it to Octal.
btod() →This function takes a Binary number as a string, and convert it to Decimal.
otod() →This function takes a Octal number as a string, and convert it to Decimal.
htod() →This function takes a Hexadecimal number as a string, and convert it to Decimal.
btoo() →This function takes a Binary number as a string, and convert it to Octal.
btoh() →This function takes a Binary number as a string, and convert it to Hexadecimal.
otob() →This function takes a Octal number as a string, and convert it to Binary.
otoh() →This function takes a Decimal number as a string, and convert it to Hexadecimal.
htob() →This function takes a Hexadecimal number as a string, and convert it to Binary.
htoo() →This function takes a Hexadecimal number as a string, and convert it to Octal.
is_decimal() → This function check if input given is a valid Decimal number or not.
is_octal() → This function check if input given is a valid Octal number or not.
is_hexadecimal() → This function check if input given is a valid Hexadecimal number or not.
is_binary() → This function check if input given is a valid Binary number or not.

3.Extra Functions.

help_menu() → This function Prints Help Menu.
void updateConversionsPerformed(string) → This function is used for updating number of conversions performed in history.txt file.
void searchInHistory(string & n) → This Function is used to Search a conversion from history.txt file.