

Decimal To String - Robert P.

Test Outputs:

```
ares.harpercollege.edu - PuTTY
e_prevost@ares:~/homeworkAssignments$ ./decimalToBinary
Please enter a valid integer (base 10) to be converted into another base: 10
Please enter a valid base between 2-20: 2
Your converted number is: 1010
e_prevost@ares:~/homeworkAssignments$ ./decimalToBinary
Please enter a valid integer (base 10) to be converted into another base: 15
Please enter a valid base between 2-20: 16
Your converted number is: F
e_prevost@ares:~/homeworkAssignments$ ./decimalToBinary
Please enter a valid integer (base 10) to be converted into another base: 12412
Please enter a valid base between 2-20: 20
Your converted number is: 1B0C
e_prevost@ares:~/homeworkAssignments$
```

Source Code:

```
decimalToBinary.C - /home/students/e_prevost/homeworkAssignments/
File Edit Search Preferences Shell Macro Windows Help
/*
 * Program that converts an integer from decimal to bases 2-20
 * Last updated 12/2/2023
 * Made By: Robert Prevost
 */
#include <iostream>
#include <iostream>
#include <limits>
#include <string>

using namespace std;

string DecimalToBase(int number, int base);

/* template code pulled directly from TemplateInput2.h by Carl Holyneaux */
template<typename inputType>
inputType ReadValue(std::string prompt)
{
    inputType returnValue=0;
    std::cout << prompt;
    std::cin >> returnValue;
    while (std::cin.fail()) {
        std::cout << "Error! Cannot read input.\n";
        std::cin.clear();
        std::cin.ignore(INT_MAX, '\n');
        std::cout << prompt;
        std::cin >> returnValue;
    }
    return returnValue;
}

template<typename inputType>
inputType ReadValue(std::string prompt, inputType minValue)
{
    inputType returnValue=0;
    returnValue=ReadValue<inputType>(prompt);
    while (returnValue < minValue) {
        std::cout << "Error! Value must be >= " << minValue << std::endl;
        returnValue=ReadValue<inputType>(prompt);
    }
    return returnValue;
}

template<typename inputType>
```

```

inputType ReadValue(std::string prompt, inputType minValue, inputType maxValue)
{
    inputType returnValue=0;
    returnValue=ReadValue<inputType>(prompt,minValue);
    while (returnValue > maxValue) {
        std::cout << "Error! Value must be <= " << maxValue << std::endl;
        returnValue=ReadValue<inputType>(prompt,minValue);
    }
    return returnValue;
}

int main()
{
    int num = ReadValue<int>("Please enter a valid integer (base 10) to be converted into another base: ",0);
    int base = ReadValue<int>("Please enter a valid base between 2-20: ");
    string conversion = DecimalToBase(num,base);

    cout<< "Your converted number is: " << conversion << endl;
}

string DecimalToBase(int number, int base)
{
    //static_cast<string>(remainder);
    string returnString = "";

    while(number > 0){
        int r = number%base;
        string remainder = to_string(r);
        switch(r){
            case 10:
                remainder = 'A';
                break;
            case 11:
                remainder = 'B';
                break;
            case 12:
                remainder = 'C';
                break;
            case 13:
                remainder = 'D';
                break;
            case 14:
                remainder = 'E';
                break;
            case 15:
                remainder = 'F';
                break;
            case 16:

```

```

                remainder = 'G';
                break;
            case 17:
                remainder = 'H';
                break;
            case 18:
                remainder = 'I';
                break;
            case 19:
                remainder = 'J';
                break;
        }

        returnString += remainder;

        number = number / base;
    }
    string returnString2 = "";
    //flip the return string
    int len = returnString.length();
    for(int i=len-1; i>=0;i--){
        returnString2 += returnString[i];
    }

    return returnString2;
}

```