Lab5_1

L5_1.cpp > main()

```cpp
#include<iostream>
#include<string>
using namespace std;
int main(){
    char Ch;
    string Message;
    cout << "Enter character : ";
    cin >> Ch;
    cout << endl;
    if(isalnum(Ch)){

        if(isalpha(Ch)){
                if(islower(Ch)) Message = "lower character.";
                else Message = "upper character.";
                }

                else if(isdigit(Ch)) Message = "digit.";
                }
                else Message = "special character.";
                cout << "\'"<< Ch << "\'"<< " is "<< Message << endl;
                    if(isalpha(Ch)) {
                        if(islower(Ch)) {
                            cout <<  "\'"<< Ch << "\'"<< " convert to upper \'";
                            cout << (char)toupper(Ch) << "\'";
                        }
                        else{
                            cout <<  "\'"<< Ch << "\'"<< " to lower \'";
                            cout << (char)tolower(Ch) << "\'";}cout << endl;
                        }
    return(0);
}
```

Output

```
Enter character : b

'b' is lower character.
'b' convert to upper 'B'
```

Lab5_2

```cpp
#include<iostream>
#include<string>
using namespace std;
int main(){
    int IntValue;
    long LongValue;
    float FloatValue;
    string StrValue;

    cout << "Enter string number : ";cin >> StrValue;
    // convert string to numeric
    IntValue = atoi(StrValue.c_str());
    LongValue = atol(StrValue.c_str());
    FloatValue = atof(StrValue.c_str());

        cout << endl;cout << "Convert String to Numeric.\n";

        cout << "*************************\n";
        cout << "Convert to integer = "<< IntValue << endl;cout << "Convert to long = "<< LongValue << endl;
        cout << "Convert to float = "<< FloatValue << endl << endl;

        // init seed value to ranom

        srand(IntValue);
        cout << "Now random integer number 10 number:"<< endl;
        cout<< "***********************************"<< endl;
        for( int N = 1, Num ; N <= 10 ; N++) {
            Num = rand() % 10;
            cout << Num << "  ";
            }cout << endl;
    return(0);
}
```

Output

```
Enter string number : 10

Convert String to Numeric.
*************************
Convert to integer = 10
Convert to long = 10
Convert to float = 10

Now random integer number 10 number:
***********************************
1  9  2  4  7  6  2  2  6  9
```

Lab5_3

L5_3.cpp > main()

```cpp
#include<iostream>
#include<math.h>
using namespace std;
int main(){
    double Value;
    cout << "Enter floating number : ";
    cin >> Value;
    cout << endl;
    cout << "\nCeiling of "<< Value << " is "<< ceil(Value);
    cout << "\nFloor of "<< Value << " is "<< floor(Value);
    cout << "\nSquare root of "<< Value << " is "<<sqrt(Value);
    cout << "\nExponential of "<< Value << " is "<< exp(Value);
    cout << "\nFloating absolute of "<< Value << " is ";
    cout << fabs(Value);
    cout << "\nNatural logarithm of "<< Value << " is ";
    cout << log(Value);
    cout << "\nLogarithm(10 base) of "<< Value << " is ";
    cout << log10(Value);
    cout << "\nPower three of "<< Value << " is ";
    cout << pow(Value,3);
    cout << "\nSin of "<< Value << " is " << sin(Value);
    cout << "\nCosine of "<< Value << " is " << cos(Value);
    cout << "\nTangent of "<< Value << " is " << tan(Value);
    cout << endl;
    return(0);
}
```

Output

```
Enter floating number : 55.5


Ceiling of 55.5 is 56
Floor of 55.5 is 55
Square root of 55.5 is 7.44983
Exponential of 55.5 is 1.26866e+24
Floating absolute of 55.5 is 55.5
Natural logarithm of 55.5 is 4.01638
Logarithm(10 base) of 55.5 is 1.74429
Power three of 55.5 is 170954
Sin of 55.5 is -0.86676
Cosine of 55.5 is 0.498726
Tangent of 55.5 is -1.73795
```

Lab5_4

```cpp
L5_4.cpp > main()
#include <iostream>
#include <cstring>
using namespace std;
int main()
{
    char Str1[30],Str2[30];
        cout << "Enter string 1 : ";
        cin >> Str1;
        cout << "Enter string 2 : ";
        cin >> Str2;
        cout << endl;
        cout << "strcat(Str1,Str2) = " << strcat( Str1, Str2);
        cout << endl;
        cout << "strchr(Str1,'s') = " << strchr( Str1, 's') << endl;
        cout << "strcmp(Str1,Str2) = " << strcmp( Str1, Str2);
        cout << endl;
        cout << "strcpy(Str1,Str2) = " << strcpy( Str1, Str2);
        cout << endl;
        cout << "strlen(Str1) = " << strlen( Str1) << endl;
        cout << "strlen(Str2) = " << strlen( Str2) << endl;
        cout << "String 1 : " << Str1 << endl;
        cout << "String 1 reverse : " ;
            for(int N = strlen( Str1) - 1 ; N >= 0 ; N--)
                cout << Str1[N];
                cout << endl << endl;
        return(0);
}

```

Output

```
Enter string 1 :s
Enter string 2 : b

strcat(Str1,Str2) = sb
strchr(Str1,'s') = sb
strcmp(Str1,Str2) = 1
strcpy(Str1,Str2) = b
strlen(Str1) = 1
strlen(Str2) = 1
String 1 : b
String 1 reverse : b
```

Lab5_5

L5_5.cpp > ...

```cpp
#include <iostream>
#include <iomanip>
#include <math.h>
using namespace std;
int main()
{
    float Raduis, Angle;
    const int WIDTH = 9;
        cout << "+" << setfill('=') << setw(44) << "+" << endl;
        cout << ": Angle : Sine : Cosine : Tangent :" << endl;
        cout << "+" << setfill('=') << setw(44) << "+" << endl;
        cout << setfill(' ');
        for (Angle = 0.0 ; Angle <= 360.0 ; Angle += 20) {
            Raduis = (Angle > 0.0) ? (180.0f*3.14f)/Angle : 0.0;
            cout << ":" << setw(WIDTH) << fixed << setprecision(2);
            cout << Angle;
            cout << " :" << setw(WIDTH) << setprecision(4) << sin(Raduis);
            cout << " :" << setw(WIDTH) << cos(Raduis);
            cout << " :" << setw(WIDTH) << tan(Raduis);
            cout << " :" << endl;
            }
            cout << "+" << setfill('=') << setw(44) << "+" << endl;
    return(0);
}
```

Output

```
+============================================+
: Angle : Sine : Cosine : Tangent :
+============================================+
:     0.00 :   0.0000 :   1.0000 :   0.0000 :
:    20.00 :   0.0143 :  -0.9999 :  -0.0143 :
:    40.00 :   1.0000 :   0.0072 : 139.5294 :
:    60.00 :   0.0048 :  -1.0000 :  -0.0048 :
:    80.00 :   0.7046 :   0.7096 :   0.9929 :
:   100.00 :  -0.5901 :   0.8073 :  -0.7309 :
:   120.00 :  -1.0000 :  -0.0024 : 418.5945 :
:   140.00 :  -0.7806 :  -0.6251 :   1.2487 :
:   160.00 :  -0.3810 :  -0.9246 :   0.4121 :
:   180.00 :   0.0016 :  -1.0000 :  -0.0016 :
:   200.00 :   0.3104 :  -0.9506 :  -0.3265 :
:   220.00 :   0.5417 :  -0.8405 :  -0.6445 :
:   240.00 :   0.7080 :  -0.7063 :  -1.0024 :
:   260.00 :   0.8236 :  -0.5672 :  -1.4522 :
:   280.00 :   0.9014 :  -0.4330 :  -2.0820 :
:   300.00 :   0.9514 :  -0.3081 :  -3.0877 :
:   320.00 :   0.9810 :  -0.1942 :  -5.0510 :
:   340.00 :   0.9958 :  -0.0914 : -10.8917 :
:   360.00 :   1.0000 :   0.0008 :1255.8483 :
+============================================+
```

Lab5_6

```cpp
#include <iostream>
#include <iomanip>
using namespace std;
int main()
{
    cout << " Decimal : Octal : Hexa " << endl;
    cout << setfill('-') << setw(30) << "-" << endl;
    cout << setfill(' ') << showbase;
        for(int Dec = 0 ; Dec <= 400; Dec += 50 ) {
            cout << " " << right << setw(7) << setbase(10)<< Dec << " : ";
            cout << right << setw(7) << setbase(8) << Dec << " : ";
            cout << left << setw(7) << setbase(16) << Dec << endl;
    }
    return(0);
}
```

Output

```
 Decimal : Octal : Hexa
------------------------------
       0 :       0 : 0
      50 :     062 : 0x32
     100 :    0144 : 0x64
     150 :    0226 : 0x96
     200 :    0310 : 0xc8
     250 :    0372 : 0xfa
     300 :    0454 : 0x12c
     350 :    0536 : 0x15e
     400 :    0620 : 0x190
```

Lab5_7

L5_7.cpp > main()

```cpp
#include <iostream>
#include <string>
using namespace std;
int main()
{
    string Str1 = "Microsoft";
    string Str2 = Str1 + "Word";
    string Str3;
    // Display value and length
    cout << "Value Str1 = " << Str1;
    cout << ", Length Str1 = " << Str1.length() << endl;
    cout << "Value Str2 = " << Str2;
    cout << ", Length Str2 = " << Str2.length() << endl;
    cout << "Value Str3 = " << Str3;
    cout << ", Length Str3 = " << Str3.length() << "\n\n";
    cout << "Enter text to Str3 : ";
    cin >> Str3;
    cout << "Now Length Str3 = " << Str3.length() << "\n\n";
    switch( Str1.compare(Str2) )
{
        case 0 : cout << "Str1 equal Str2" << endl; break;
        case 1 : cout << "Str1 more than Str2" << endl; break;
        case -1 : cout << "Str1 less than Str2" << endl; break;
        }
    // find 's' from Str3
        cout << "\nNow find 's' in Str3" << endl;
        int pos = Str3.find("s");
        if (pos > -1)
        cout << "found 's' in Str3 at position " << pos << endl;
        else
        cout << "not found 's' in Str3." << endl;
        // delete character in Str2
        Str2.erase(5,4);
        cout << "Aftet erase character to Str2 : " << Str2 << endl;
        // replace character in Str1
        Str1.replace(5,4,"chip");
        cout << "Aftet replace character to Str1 : " << Str1 << endl;
        // use substr in Str1 and Str2
        cout << "\nString substr from Str1 and Str2 : ";
        cout << Str1.substr(0,5) << Str2.substr(5,4) << endl;
    return(0);
}
```

Output

```
Value Str1 = Microsoft, Length Str1 = 9
Value Str2 = MicrosoftWord, Length Str2 = 13
Value Str3 = , Length Str3 = 0

Enter text to Str3 : B
Now Length Str3 = 1


Now find 's' in Str3
not found 's' in Str3.
Aftet erase character to Str2 : MicroWord
Aftet replace character to Str1 : Microchip
```