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// Lab # 1
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// Microsoft Visual Studio (Visual C++)
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#include <iostream>
#include <string>
#include <regex> //for regex_match
```

```
using namespace std;
```

```
class Factorial
{
    private:
    int fact = 1;

    // Asserts
    bool iszerofactorialisone(int n) {
        if (n == 0) {
            return true;
        }
        else {
            return false;
        }
    }
    bool isonefactorialisone(int n) {
        if (n == 1) {
            return true;
        }
        else {
            return false;
        }
    }
    bool istwofactorialstwo(int n) {
        if (n == 2) {
            return true;
        }
        else {
            return false;
        }
    }
    bool isthreefactorialsix(int n) {
        if (n == 3) {
            return true;
        }
        else {
            return false;
        }
    }
}
```

```

bool isfivefactorialsonetwenty(int n) {
    if (n == 5) {
        return true;
    }
    else {
        return false;
    }
}

```

// Stubs

```

int zerofactorialisone(int n) {
    cout << "Input: " << n << endl;
    return 1;
}
int onefactorialisone(int n) {
    cout << "Input: " << n << endl;
    return 1;
}
int twofactorialstwo(int n) {
    cout << "Input: " << n << endl;
    return 2;
}
int threefactorialsix(int n) {
    cout << "Input: " << n << endl;
    return 6;
}
int fivefactorialsonetwenty(int n) {
    cout << "Input: " << n << endl;
    return 120;
}

```

public:

```

int getFactorial(int n) {
    if (iszerofactorialisone(n) == true) {
        fact = zerofactorialisone(n);
    }
    else if (isonefactorialisone(n) == true) {
        fact = onefactorialisone(n);
    }
    else if (istwofactorialstwo(n) == true) {
        fact = twofactorialstwo(n);
    }
    else if (isthreefactorialsix(n) == true) {
        fact = threefactorialsix(n);
    }
    else if (isfivefactorialsonetwenty(n) == true) {

```

```

        fact = fivefactorialisonetwenty(n);
    }
    else {
        cout << "Input: " << n << endl;
        fact = 1;
        for (int i = 1; i <= n; i++) {
            fact = i*fact;
        }
    }
    return fact;
}

bool isValidate(string strNumber) {
    regex integer("(\\+)?[[:digit:]]+");
    if (regex_match(strNumber, integer)) {
        return true;
    }
    else {
        return false;
    }
}

};

int main()
{
    Factorial obj;
    string strNumber;
    int num;
    cout << "Enter a number: ";
    cin >> strNumber;

    while (!obj.isValidate(strNumber)) {
        cout << "\nInvalid Input!" << endl;
        cout << "Please enter a number again: ";
        cin >> strNumber;
    }
    num = stoi(strNumber); //coverting string to integer
    cout << "-----" << endl;
    cout << "Result: " << obj.getFactorial(num) << endl;
    cout << "-----" << endl;
    system("PAUSE");
    return 0;
}

```