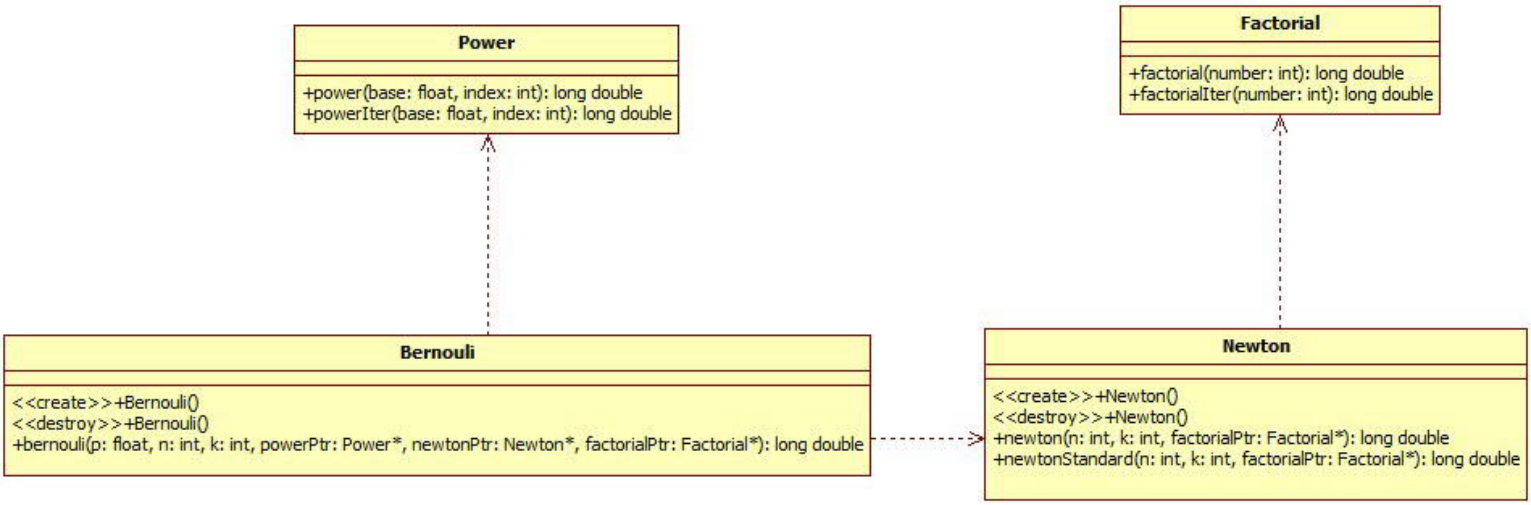
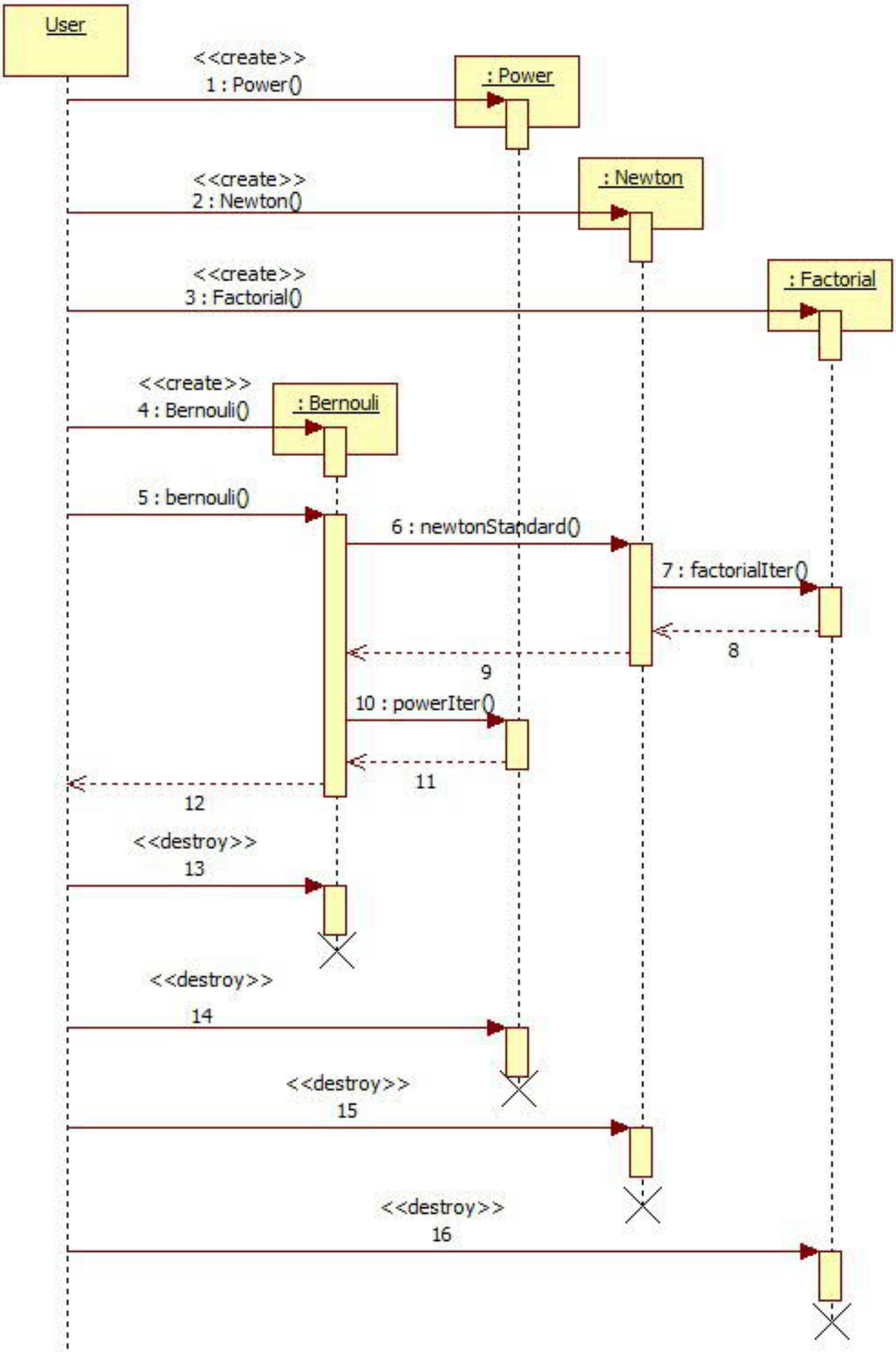
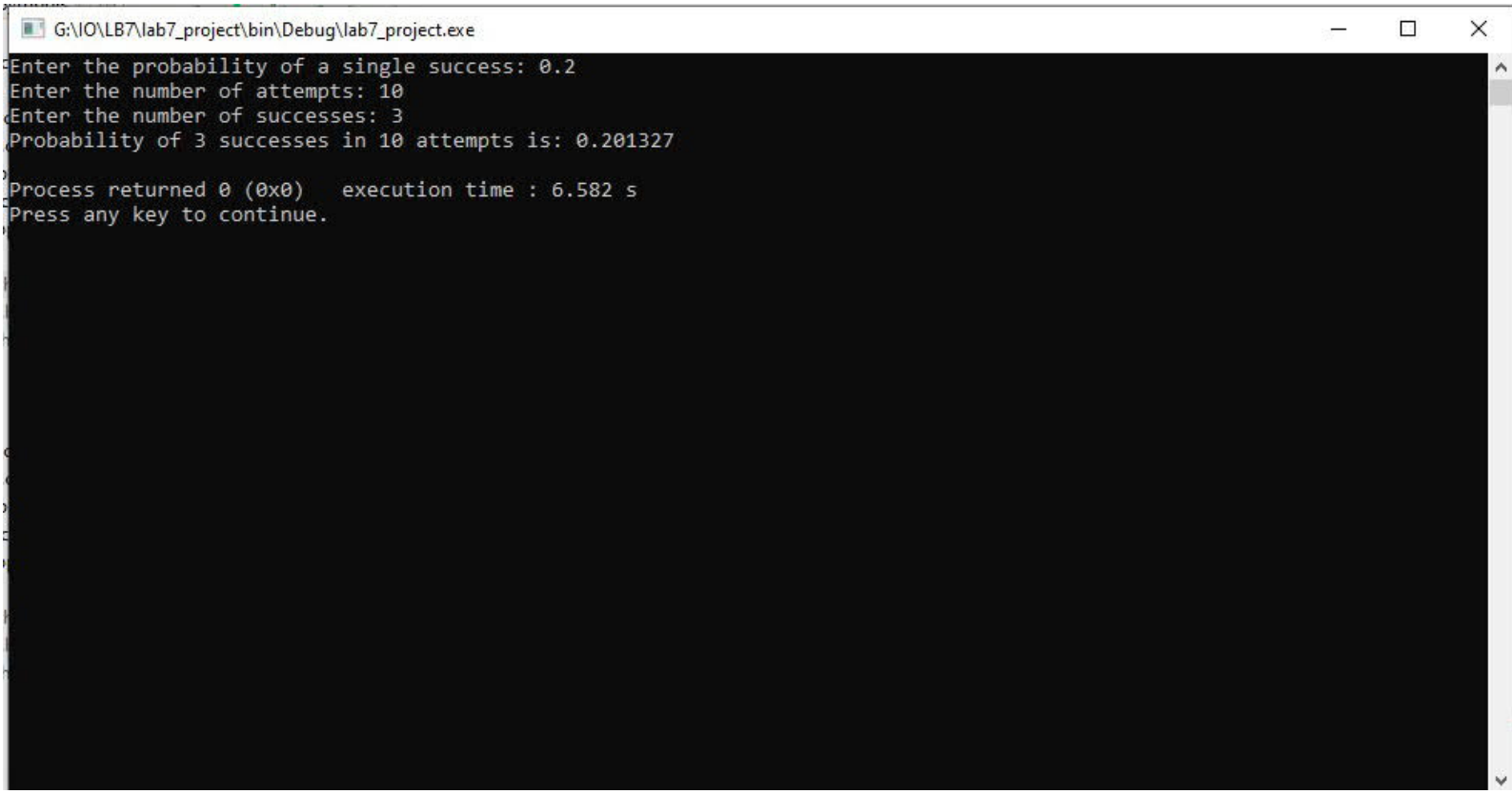

Power
+power(base: float, index: int): long double
+powerIter(base: float, index: int): long double
Factorial
+factorial(number: int): long double
+factorialIter(number: int): long double
Bernouli
<<create>>+Bernouli()
<<destroy>>+Bernouli()
+bernouli(p: float, n: int, k: int, powerPtr: Power*, newtonPtr: Newton*, factorialPtr: Factorial*): long double
Newton
<<create>>+Newton()
<<destroy>>+Newton()
+newton(n: int, k: int, factorialPtr: Factorial*): long double
+newtonStandard(n: int, k: int, factorialPtr: Factorial*): long double


User
<<create>>
1 : Power()
: Power
<<create>>
2 : Newton()
: Newton
<<create>>
3 : Factorial()
: Factorial
<<create>>
4 : Bernouli()
: Bernouli
5 : bernouli()
6 : newtonStandard()
7 : factorialIter()
8
9
10 : powerIter()
11
12
<<destroy>>
13
<<destroy>>
14
<<destroy>>
15
<<destroy>>
16

```
#if !defined(_POWER_H)
#define _POWER_H


class Power {
public:
	long double power(float base, int index);
	long double powerIter(float base, int index);
};

#endif  //_POWER_H
//---------------------------------------------------------------------------
#if !defined(_FACTORIAL_H)
#define _FACTORIAL_H


class Factorial {
public:
	long double factorial(int number);
	long double factorialIter(int number);
};

#endif  //_FACTORIAL_H
//---------------------------------------------------------------------------
#include "Factorial.h"

#if !defined(_NEWTON_H)
#define _NEWTON_H


class Newton {
public:
	Newton();
	~Newton();
	long double newton(int n, int k, Factorial* factorialPtr);
	long double newtonStandard(int n, int k, Factorial* factorialPtr);
};

#endif  //_NEWTON_H
//---------------------------------------------------------------------------
#include "Power.h"
#include "Newton.h"

#if !defined(_BERNOULI_H)
#define _BERNOULI_H


class Bernouli {
public:
	Bernouli();
	~Bernouli();
	long double bernouli(float p, int n, int k, Power* powerPtr, Newton* newtonPtr, Factorial*
factorialPtr);
};

#endif  //_BERNOULI_H
//---------------------------------------------------------------------------
```

```
#include "Power.h"

long double Power::power(float base, int index) {
    if(index == 0) {
        return 1;
    }
    return base * power(base, index-1);
}

long double Power::powerIter(float base, int index) {
    long double result = 1;
    for(int i = 0 ; i < index; i++) {
        result *= base;
    }
    return result;
}
//---------------------------------------------------------------------------
#include "Factorial.h"

long double Factorial::factorial(int number) {
    if(number == 0) {
        return 1;
    }
    return number * factorial(number-1);
}

long double Factorial::factorialIter(int number) {
    long double result = 1;
    for(int i = 1; i <= number; i++) {
        result *= i;
    }
    return result;
}
//---------------------------------------------------------------------------

#include "Newton.h"

Newton::Newton() {

}

Newton::~Newton() {

}

long double Newton::newton(int n, int k, Factorial* factorialPtr) {
    int N = n - k;
    int NbyK = 1;

    if(k >= N) {
        for(int i=k+1; i<=n; i++){
            NbyK *= i;
        }
        return NbyK/factorialPtr->factorial(N);
    } else {
        for(int i = N+1; i <= n; i++) {
            NbyK *= i;
        }
        return NbyK/factorialPtr->factorial(k);
    }
}
```

```
long double Newton::newtonStandard(int n, int k, Factorial* factorialPtr) {
    return factorialPtr->factorial(n) / (factorialPtr->factorial(k) * factorialPtr->factorial(n-k));
}
//-----------------------------------------------------------------------------------------------------------------
#include "Bernouli.h"

Bernouli::Bernouli() {

}

Bernouli::~Bernouli() {

}

long double Bernouli::bernouli(float p, int n, int k, Power* powerPtr, Newton* newtonPtr, Factorial*
factorialPtr) {
    float q = 1 - p;
    return newtonPtr->newton(n, k) * powerPtr->power(p, k) * powerPtr->power(q, n-k);
}
//-----------------------------------------------------------------------------------------------------------------
#include <iostream>
#include "Bernouli.h"

using namespace std;

bool isTheDataCorrect(float p, int n, int k) {
    return p <= 1 && p >= 0 && n >= 0 && k >= 0 && k <= n;
}

int main()
{
    float singleProbability;
    int numberOfAttempts, numberOfSuccesses;

    cout << "Enter the probability of a single success: ";
    cin >> singleProbability;
    cout << "Enter the number of attempts: ";
    cin >> numberOfAttempts;
    cout << "Enter the number of successes: ";
    cin >> numberOfSuccesses;

    if(isTheDataCorrect(singleProbability, numberOfAttempts, numberOfSuccesses)){
        Power* power = new Power();
        Newton* newton = new Newton();
        Factorial* Factorial = new Factorial();
        Bernouli* calculator = new Bernouli();
        cout << "Probability of " << numberOfSuccesses << " successes in " << numberOfAttempts
        << " attempts is: " << calculator->bernouli(singleProbability,numberOfAttempts, numberOfSuccesses,
power, newton, factorial) << "\n";
        delete calculator;
    } else {
        cout << "Error: Incorrect data\n";
    }

    return 0;
}
//=========================================================
```


G:\IO\LB7\lab7_project\bin\Debug\lab7_project.exe
Enter the probability of a single success: 0.2
Enter the number of attempts: 10
Enter the number of successes: 3
Probability of 3 successes in 10 attempts is: 0.201327
Process returned 0 (0x0)   execution time : 6.582 s
Press any key to continue.