```
//**********************Question 1st.

//the machine precision for double precision numbers.
#include <iostream>
#include <iomanip>

using std::setprecision;

int main()
{
  double i = 0;
  double eps = 0.001;

//test if the machine recognizes 1+eps is different from 1; if it recognizes
// the different, then we provide a smaller number

 while(i != 1.0)
    {
      eps = eps/2;
      i = 1 + eps;
    }

// eps*2 because it can NOT be recognized by machine, we want a number can
// be recognized.
   std::cout << setprecision(22)<< "eps = " << eps*2 << std::endl;

  return 0;
}

//eps = 1.1368683772161603210 6e-16


//****************Question 2nd.

// compute the factorial of an integer

#include <iostream>

using namespace std;

int main()
{


        int i=0,j=0;

        //input
        cout << " enter an integer:"<<endl;
        cin >> i;

        //compute factorial
        for (j = i-1; j>0; --j){
                i=i*j;
        }

        //output
        cout << "the factorial of this integer is:" <<i<< endl;

        return 0;

}
```

```
//      enter an integer:
//      7
//      the factorial of this integer is:5040




//****************Question 3rd.


//computes the Fibonacci series starting from 2 arbitrary integers
#include <iostream>


using namespace std;

int main()
{

        double penultimate, last;
        int terms;

//input
        cout << " the first integer: ";
        cin >> penultimate;

        cout << " the second integer: ";
        cin >> last;

        cout << " Number of terms: ";
        cin >> terms;



//compute
        for (int i=0; i<terms; ++i)
        {
                double temp=0;
                temp=last;
                last+=penultimate;
                penultimate = temp;


        }

//output
        double ratio = last/penultimate;
        cout << "the last term is " << last << endl <<"the penultimate term is "
        <<penultimate<< endl
        << "the ratio is: " << ratio << endl;




        return 0;

}



 the first integer: 28
 the second integer: 33
 Number of terms: 7
```

```
the last term is 1057
the penultimate term is 653
the ratio is: 1.61868


//****************Question 4th


#include <iostream>
#include <iomanip>



using namespace std;

int main()
{

        double smallest = 0, temp = 1;


        while (temp > 0)
        {
                smallest = temp;
                temp /= 2;
        }

        cout << setprecision(22)<< "the smallest: " << smallest << endl;

        double largest = 0;
        temp = 10000000;

        while (1/temp > 0 )
        {
                largest = temp;
                temp = temp*1.0001;

        }

        cout << setprecision(22)<< "the largest: " << largest << endl;

        return 0;
}


the smallest: 4.940656458412465441766e-324
the largest: 1.7975135716436158635 78e+308



//****************Question 5th

#include <iostream>
#include <iomanip>



using namespace std;

int main()
{
```

```
        int largest = 0;
        int temp = 1000;

        while (temp > 0 )
        {
                largest = temp;
                temp = temp +1;

        }

        cout << setprecision(22)<< "the largest: " << largest << endl;

        return 0;
}
```

```
the largest: 2147483647
```