1. Write a "bullet proof" input function which prompts the user to input an integer in the range \( \text{min} < \text{in} < \text{max} \). The input is accepted and any character which is not a digit 0 to 9 is discarded. The input is then checked for range and if it is in range the integer is returned. If the input is not in range and error message is issued and the minimum value is returned. A main program to exercise the function is given below.

```cpp
#include<iostream>
#include<cstdlib>
using namespace std;
main()
{int i, min = 0, max = 10;
 while(max != 0)
  {cout << "Enter a minimum... ";
   cin >> min;
   cout << "\nEnter a maximum... ";
   cin >> max;
   if(max != 0)
    {i = GetInput(min, max);
     cout << "The value input was " << i << endl;
    }
  }
 system("Pause");
}
```

2. Write a program to input a sentence, \( s1 \), and two words \( w1 \) and \( w2 \). Your program should replace all occurrences of the word\( w1 \) in the sentence with the word \( w2 \). The number of spaces in the sentence should not be altered.

3. Write a function called \textit{SwapElements} which accepts an array and two ints as arguments. The function swaps the two elements whose index is given by the two ints. For example if we define an array as:

   ```c
   int a[] = {0, 1, 2, 3, 4, 5};
   ```

   The following call would swap elements 2 and 4:

   ```c
   SwapElements(a, 2, 4);
   ```

   The values in the array after the call would be: 0, 1, 4, 3, 2, 5.

4. Write a program to input an integer from the user and print out the same integer in binary format. For example, if I input the number 20 the program should output 10100. If I input the number 4096 the output will be 10000000000.
5. A rectangle class is defined below along with a main program to exercise the class members. Write the class function definitions so that the main program runs correctly.

```cpp
#include<iostream>
#include<cstdlib>
using namespace std;

class Rectangle
{
public:
    Rectangle(double x, double y);
    bool Set(double x, double y);
    void Get(double &x, double &y);
    double Area(void);
    double Perimeter(void);
private:
    bool CheckValid(double x, double y);
    double length;
    double width;
};

int main()
{
    double x, y;
    Rectangle r1(0, 0);
    cout << "Enter a length and width...";
    cin >> x >> y;
    if(r1.Set(x, y))
    {
        cout << "A rectangle of dimensions " << x << " by " << y << " has an area of " << r1.Area() << " and a perimeter of " << r1.Perimeter() << endl;
    }
    else
    {
        cout << "Rectangle dimensions were not valid." << endl;
        return 0;
    }
}
```