

1. Define CMyString class with demands as follows:

- 1.1 The class, CMyString, can save any string which means an arbitrary length;
- 1.2 Overload operator+() to append string to another one;
- 1.3 Overload operator<<() to print the string;
- 1.4 Overload operator[]() to get or set a character.
- 1.5 Define Find() member function to locate the first position of searching a character or a string;
- 1.6 Define Mid() member function to get substring from one string;
- 1.7 Define ToInt() member function to convert digital string to integer.
- 1.8 Define ToDouble() member function to convert digital string to double.
- 1.9 Define other member functions if you need.
- 1.10 The client can use CMyString you defined like as in the main:

```
int main()
{
    CMyString s1("BIT"),    s2;
    s2 = "love";
    s2[0] = 'L'
    cout << "I " + s2 + << " " << s1 << endl;        // The output is:  I Love BIT
    int pos = s1.Find('T');                            // pos is 2,  or -1 if  'T'  is not found.
    int pos = s1.Find("IT");                            // pos is 1,  or -1 if  "IT"  is not found.

    CMyString str_num;
    str_num = 123;                                    // str_num is "123"
    int a = str_num.ToInt();                            // a = 123

    str_num = 123.456;                                // str_num is "123.456"
    double b = str_num.ToDouble();                    // b is 123.456
    int start = 0, len = 2;
    CMyString my = s2.Mid(start, len);                // start represents starting position, len represents the length of substring. So Mid can get a substring "ov".
    return 0;
}
```

NOTE: The type such as string and template in C++, and string library in C and C++ are both FORBIDDEN in your program.

The only one you can define is char*.

2. Define CInternetURL class to save a URL string like as "https://www.bit.edu.cn/xww/zhxw/index.htm", and finish the demands as follows:

- 2.1 You can only use CMyString to implement your program. That is, char* is also FORBIDDEN.
- 2.2 Define member function getDomain() to get domain from URL.
For example, we can get "www.bit.edu.cn" from "https://www.bit.edu.cn/xww/zhxw/index.htm";
- 2.3 Define member function getDomainCountry() to get country name in the domain from URL, such as "us", "uk", etc.
For example, we can get "cn" from "https://www.bit.edu.cn/xww/zhxw/index.htm";
- 2.4 Define member function getDomainType() to get domain type from URL, such as "gov", "com", "org", and so on.
For example, we can get "edu" from "https://www.bit.edu.cn/xww/zhxw/index.htm";
- 2.5 The client can use MyString you defined like as in the main:

```
void main()
{
    CInternetURL URL("https://www.bit.edu.cn/xww/zhxw/index.htm"), s2;
    cout << URL.GetDomain();           // The result is:  www.bit.edu.cn
    cout << URL.GetDomainCountry();     // The result is:  cn
    cout << URL.GetDomainType();        // The result is:  edu
}
```

3. The Vehicle is composed of Frame(车架), CarDoor and Tyre.

- 3.1 The statement, cin >> Frame, means that we can input ID and weight of Frame.
 - 3.2 The statement, cin >> Cardoor, means that we can input number and color of CarDoor.
 - 3.3 The statement, cin >> Tyre, means that we can input number of Tyre.
 - 3.4 The statement, cout << Vehicle, means that we can output ID, number of door and tyre.
- Wrap up the code and finish those demands as above.

Note:

- (1) DON'T define global variables.
- (2) Define any members you need.
- (3) Consider the relationship among classes.