



# BATCH RECURSION AND C++

PROGRAMMING MASTERCLASS

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C++ Class-10

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<https://www.hsccrackers.com/>



SCAN ME

# STL

# Vector

```
1 #include<iostream>
2 #include<vector>
3 using namespace std;
4 int main(){
5     vector<int> v;
6     cout<<"Size: "<<v.size()<<endl;
7     for(int i = 0;i < 10;i++) v.push_back(i);
8     cout<<"Size now: "<<v.size()<<endl;
9     cout<<"Current Contents"<<endl;
10    for(int i = 0;i < v.size();i++) cout<<v[i]<<" ";
11    cout<<endl;
12    for(int i = 0;i < 10;i++) v.push_back(i+10);
13    cout<<"Size now: "<<v.size()<<endl;
14    cout<<"Current Contents"<<endl;
15    for(int i = 0;i < v.size();i++) cout<<v[i]<<" ";
16    cout<<endl;
17    for(int i = 0;i < 10;i++) v.pop_back();
18    cout<<"Size now: "<<v.size()<<endl;
19    cout<<"Current Contents"<<endl;
20    for(int i = 0;i < v.size();i++) cout<<v[i]<<" ";
21    cout<<endl;
22 }
```

Size: 0  
Size now: 10  
Current Contents  
0 1 2 3 4 5 6 7 8 9  
Size now: 20  
Current Contents  
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19  
Size now: 10  
Current Contents  
0 1 2 3 4 5 6 7 8 9  
Program ended with exit code: 0

# Vector

```
1 #include<iostream>
2 #include<vector>
3 using namespace std;
4 int main(){
5     vector<int> v(5,1);
6     cout<<"Size now: "<<v.size()<<endl;
7     cout<<"Current Contents"<<endl;
8     for(int i = 0;i < v.size();i++){
9         cout<<v[i]<<" ";
10    }cout<<endl;
11    vector<int>::iterator p = v.begin();
12    p+=2;
13    v.insert(p, 10,9);
14    cout<<"Current Contents after insert"<<endl;
15    for(int i = 0;i < v.size();i++){
16        cout<<v[i]<<" ";
17    }cout<<endl;
18    p = v.begin();
19    p+=2;
20    v.erase(p, p+10);
21    cout<<"Current Contents after erase"<<endl;
22    for(int i = 0;i < v.size();i++){
23        cout<<v[i]<<" ";
24    }cout<<endl;
25 }
```

```
Size now: 5
Current Contents
1 1 1 1 1
Current Contents after insert
1 1 9 9 9 9 9 9 9 9 1 1 1
Current Contents after erase
1 1 1 1 1
Program ended with exit code: 0
```

# Iterator

```
1 #include<iostream>
2 #include<vector>
3 using namespace std;
4 int main(){
5     vector<int> v;
6     cout<<"Size: "<<v.size()<<endl;
7     for(int i = 0;i < 10;i++) v.push_back(i);
8     cout<<"Size now: "<<v.size()<<endl;
9     cout<<"Current Contents"<<endl;
10    vector<int>::iterator i;
11    for(i = v.begin();i < v.end();i++){
12        cout<<*i<<" ";
13    }cout<<endl;
14 }
```

```
▶
Size: 0
Size now: 10
Current Contents
0 1 2 3 4 5 6 7 8 9
Program ended with exit code: 0
```

# Pair

```
1 #include<iostream>
2 #include<vector>
3 using namespace std;
4 int main(){
5     pair<int,int> p(100,200);
6     pair<int,string> q = make_pair(10, "Hello");
7     pair<double,bool> r = {10.5,true};
8     cout<<p.first<<endl;
9     cout<<p.second<<endl;
10    cout<<q.first<<endl;
11    cout<<q.second<<endl;
12    cout<<r.first<<endl;
13    cout<<r.second<<endl;
14 }
15
```

▶

```
100
200
10
Hello
10.5
1
Program ended with exit code: 0
```

# Map

```
1 #include<iostream>
2 #include<map>
3 using namespace std;
4 int main(){
5     map<char,int> m;
6     for(int i = 0;i < 10;i++) m.insert(make_pair('a'+i, i));
7     char ch;
8     cout<<"Enter a key :"<
```

▶ Enter a key :

j

9

3

Program ended with exit code: 0

# Set

```
1 #include<iostream>
2 #include<set>
3 using namespace std;
4 int main(){
5     set<int> s;
6     s.insert(3);
7     s.insert(10);
8     s.insert(5);
9     set<int>::iterator i;
10    for(i = s.begin();i != s.end();i++){
11        cout<<*i<<endl;
12    }
13 }
14 |
```

3  
5  
10

Program ended with exit code: 0

# String

```
1 #include<iostream>
2 #include<string>
3 using namespace std;
4 int main(){
5     string str1("hello world");
6     string str2("string 2");
7     string str3;
8     str3 = str1;
9     cout<<str1<<endl<<str3<<endl;
10    str3 = str1 + str2;
11    cout<<str3<<endl;
12    if(str3 > str1) cout<<"str3 > str1"<<endl;
13    if(str3 == str1+str2) cout<<"str3 == str1 + str2"<<endl;
14 }
15 |
```

▶

```
hello world
hello world
hello worldstring 2
str3 > str1
str3 == str1 + str2
Program ended with exit code: 0
```

# String

```
1 #include<iostream>
2 #include<string>
3 using namespace std;
4 int main(){
5     string str1("hello world");
6     string str2("string 2");
7     cout<<"Initial strings"=><endl;
8     cout<<"str1: "<<str1<<endl;
9     cout<<"str2: "<<str2<<endl;
10    cout<<"Inserting str2 into str1"=><endl;
11    str1.insert(5, str2);
12    cout<<str1<<endl;
13    cout<<"Remove 7 charcters from str1: "<<endl;
14    str1.erase(5,7);
15    cout<<str1<<endl;
16    cout<<"Replace 2 characters in str1 with str2"=><endl;
17    str1.replace(5, 2, str2);
18    cout<<str1<<endl;
19 }
```

```
Initial strings
str1: hello world
str2: string 2
Inserting str2 into str1
hellostring 2 world
Remove 7 charcters from str1:
hello2 world
Replace 2 characters in str1 with str2
hellostring 2world
Program ended with exit code: 0
```

# Stack

```
1 #include<iostream>
2 #include<stack>
3 using namespace std;
4 int main(){
5     stack< int > st;
6     st.push( 100 ); // inserting 100
7     st.push( 101 ); // inserting 101
8     st.push( 102 ); // inserting 102
9     while( !st.empty() ) {
10         cout << st.top() << endl; // printing the top
11         st.pop(); // removing that one
12     }
13 }
```

▶

102  
101  
100  
Program ended with exit code: 0

# Queue

```
1 #include<iostream>
2 #include<queue>
3 using namespace std;
4 int main(){
5     queue< int > q;
6     q.push( 100 ); // inserting 100
7     q.push( 101 ); // inserting 101
8     q.push( 102 ); // inserting 102
9     while( !q.empty() ) {
10         cout << q.front() << endl; // printing the front
11         q.pop(); // removing that one
12     }
13 }
```

```
100
101
102
Program ended with exit code: 0
```

# Sort

```
1 #include<iostream>
2 #include<vector>
3 #include<algorithm>
4 using namespace std;
5 int main(){
6     int arr[5] = {105,106,100,120,76};
7     sort(arr, arr+5); //ascending
8     for(int i = 0;i < 5;i++){
9         cout<<arr[i]<<" ";
10    }cout<<endl;
11    sort(arr, arr+5,greater<int>()); //descending
12    for(int i = 0;i < 5;i++){
13        cout<<arr[i]<<" ";
14    }cout<<endl;
15 }
```

```
76 100 105 106 120
120 106 105 100 76
Program ended with exit code: 0
```

# Sort

```
2 #include<vector>
3 #include<algorithm>
4 using namespace std;
5 int main(){
6     vector<int> v = {100,300,400,200,500};
7     sort(v.begin(),v.end()); //ascending
8     for(int i = 0;i < 5;i++){
9         cout<<v[i]<<" ";
10    }cout<<endl;
11    sort(v.begin(), v.end(),greater<int>()); //descending
12    for(int i = 0;i < 5;i++){
13        cout<<v[i]<<" ";
14    }cout<<endl;
15 }
16 |
```

100 200 300 400 500  
500 400 300 200 100  
Program ended with exit code: 0

# Reverse

```
2 #include<vector>
3 #include<algorithm>
4 using namespace std;
5 int main(){
6     vector<int> v = {100,300,400,200,500};
7     reverse(v.begin(),v.end());
8     for(int i = 0;i < 5;i++){
9         cout<<v[i]<<" ";
10    }cout<<endl;
11 }
12 |
```

```
500 200 400 300 100
Program ended with exit code: 0
```

# Next Permutation

```
2 #include<vector>
3 #include<algorithm>
4 using namespace std;
5 int main(){
6     vector<int> v = {1,2,3,4};
7     do{
8         for(int i = 0;i < 4;i++){
9             cout<<v[i]<<" ";
10        }
11        cout<<endl;
12    }while(next_permutation(v.begin(), v.end()));
13 }
```

```
1 2 3 4
1 2 4 3
1 3 2 4
1 3 4 2
1 4 2 3
1 4 3 2
2 1 3 4
2 1 4 3
2 3 1 4
2 3 4 1
2 4 1 3
2 4 3 1
3 1 2 4
3 1 4 2
3 2 1 4
3 2 4 1
3 4 1 2
3 4 2 1
4 1 2 3
4 1 3 2
4 2 1 3
4 2 3 1
4 3 1 2
4 3 2 1
```

# Previous Permutation

```
2 #include<vector>
3 #include<algorithm>
4 using namespace std;
5 int main(){
6     vector<int> v = {4,3,2,1};
7     do{
8         for(int i = 0;i < 4;i++){
9             cout<<"\r"i<<" ";
10            j
11         cout<<endl;
12     }while(prev_permutation(v.begin(), v.end()));
13 }
```

```
4 3 2 1
4 3 1 2
4 2 3 1
4 2 1 3
4 1 3 2
4 1 2 3
3 4 2 1
3 4 1 2
3 2 4 1
3 2 1 4
3 1 4 2
3 1 2 4
2 4 3 1
2 4 1 3
2 3 4 1
2 3 1 4
2 1 4 3
2 1 3 4
1 4 3 2
1 4 2 3
1 3 4 2
1 3 2 4
1 2 4 3
1 2 3 4
```

# Loop

```
1 #include<iostream>
2 #include<vector>
3 #include<algorithm>
4 using namespace std;
5 int main(){
6     vector<int> v = {4,3,2,1};
7     for(auto x: v){
8         cout<<x<<" ";
9     }cout<<endl;
10 }
11 |
```



4 3 2 1

Program ended with exit code: 0

# Loop

```
1 #include<iostream>
2 #include<map>
3 #include<algorithm>
4 using namespace std;
5 int main(){
6     map<char, int> m;
7     m['j'] = 10;
8     m['z'] = 26;
9     m['a'] = 1;
10    m['c'] = 3;
11    for(auto x : m){
12        cout<<x.first<<" "<<x.second<<endl;
13    }
14 }
```

```
a 1
c 3
j 10
z 26
```

Program ended with exit code: 0