



실전 알고리즘 0x05강 스택

BaaaaaaaaaaaaaaaaarkingDog

목차



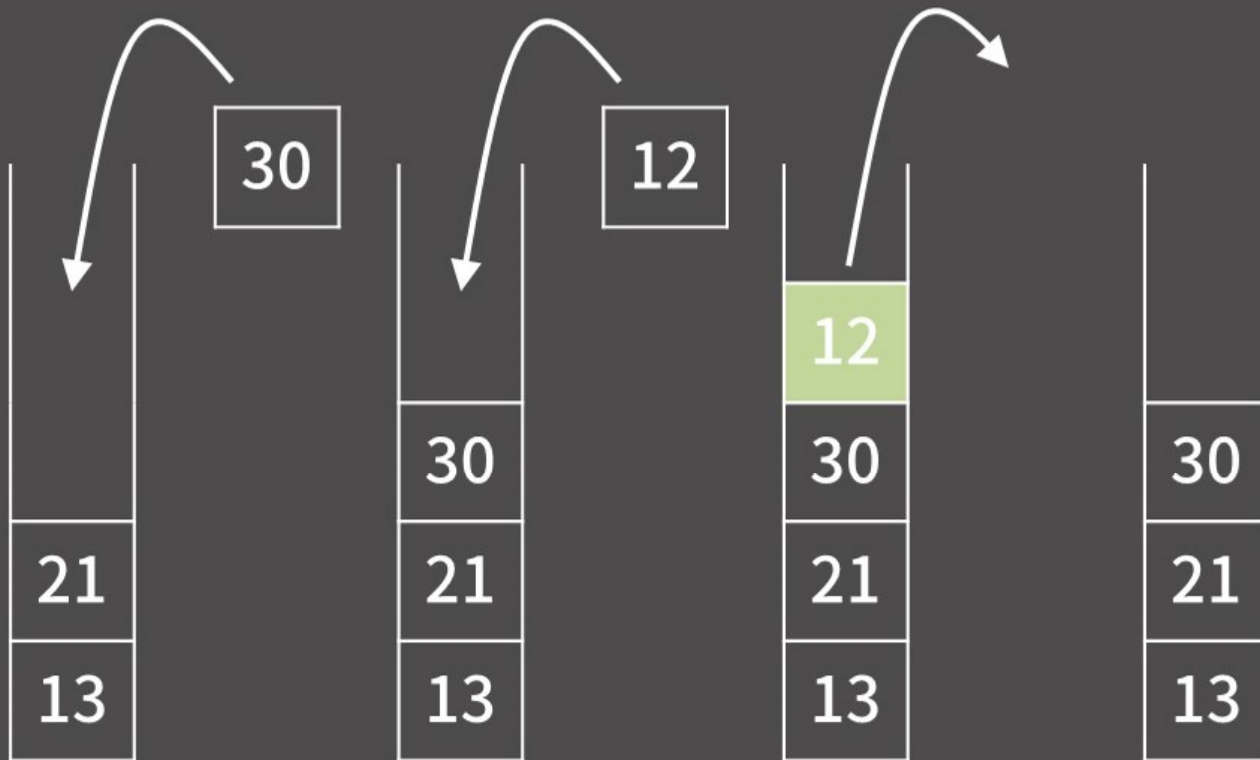
0x00 정의와 성질

0x01 기능과 구현

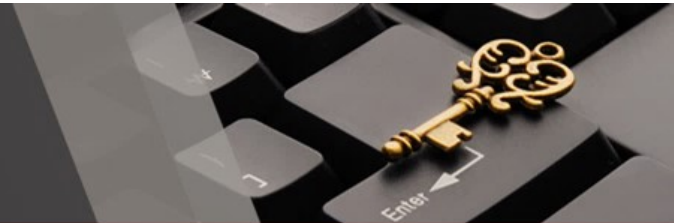
0x02 STL stack

0x03 연습문제

0x00 정의와 성질



0x00 정의와 성질



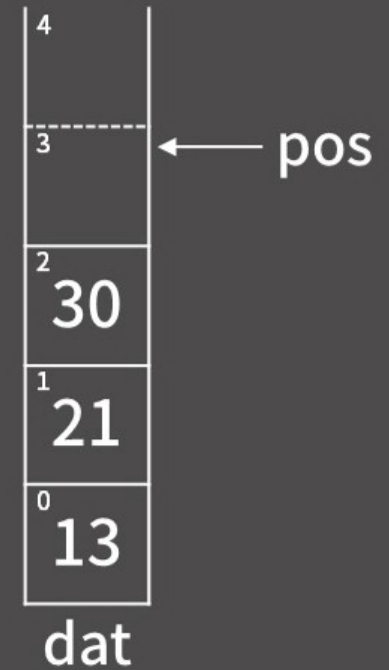
스택의 성질

1. 원소의 추가가 $O(1)$
2. 원소의 제거가 $O(1)$
3. 제일 상단의 원소 확인이 $O(1)$
4. 제일 상단이 아닌 나머지 원소들의 확인/변경이 원칙적으로 불가능

0x01 기능과 구현

구현

```
01  const int MX = 1000005;  
02  int dat[MX];  
03  int pos = 0;
```



0x01 기능과 구현

구현

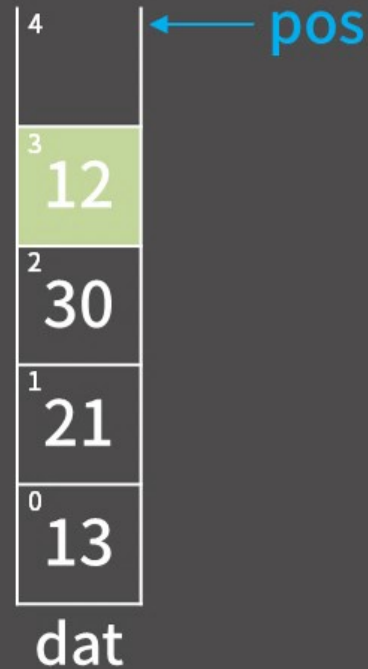
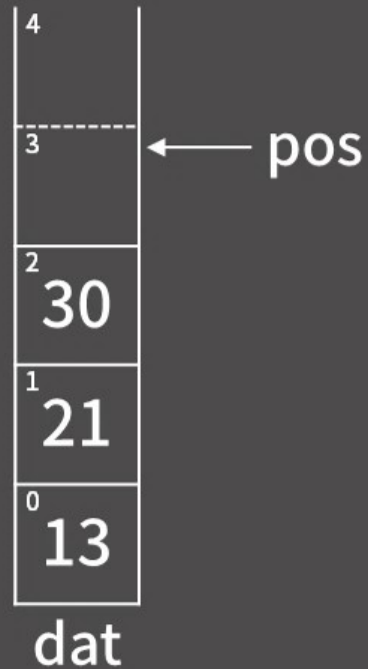
https://github.com/blisstoner/basic-algo-lecture-material/blob/master/0x05/stack_test.cpp

```
01  #include <bits/stdc++.h>
02  using namespace std;
03
04  const int MX = 1000005;
05  int dat[MX];
06  int pos = 0;
07
08  void push(int x) {
09
10  }
11
12  void pop() {
13
14  }
```

```
15  int top() {
16
17  }
18
19  void test() {
20      ...
21  }
22
23  int main(void) {
24      test();
25  }
```

0x01 기능과 구현

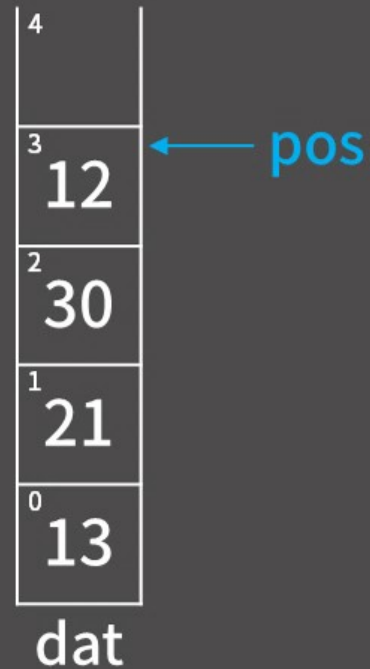
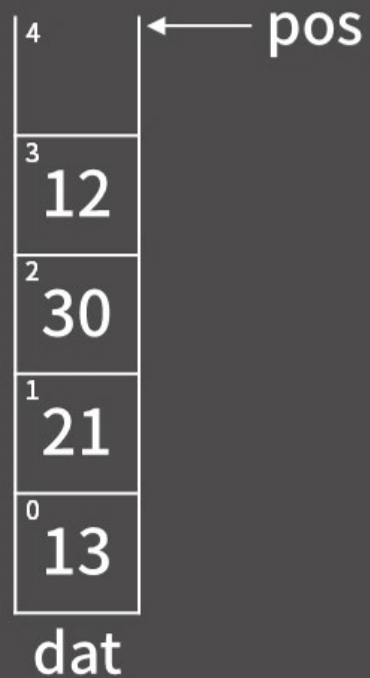
push 함수



```
01 void push(int x){  
02     dat[pos++] = x;  
03 }
```

0x01 기능과 구현

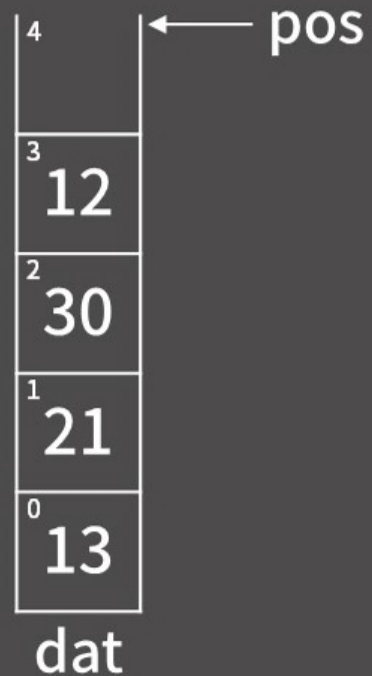
pop 함수



```
01 void pop() {  
02     pos--;  
03 }
```


0x01 기능과 구현

top 함수



```
01 int top() {  
02     return dat[pos-1];  
03 }
```

[https://github.com/blisstoner/basic-algo-lecture-material/
blob/master/0x05/stack_test_ans.cpp](https://github.com/blisstoner/basic-algo-lecture-material/blob/master/0x05/stack_test_ans.cpp)

0x02 STL stack

reference : <http://www.cplusplus.com/reference/stack/stack/>

https://github.com/blisstoner/basic-algo-lecture-material/blob/master/0x05/stack_example.cpp

```
01  #include <bits/stdc++.h>
02  using namespace std;
03
04  int main(void) {
05      stack<int> S;
06      S.push(10); // 10
07      S.push(20); // 10 20
08      S.push(30); // 10 20 30
09      cout << S.size() << '\n'; // 3
10      if(S.empty()) cout << "S is empty\n";
11      else cout << "S is not empty\n"; // S is not empty
12      S.pop(); // 10 20
13      cout << S.top() << '\n'; // 20
14      S.pop(); // 10
15      cout << S.top() << '\n'; // 10
16      S.pop(); // empty
17      if(S.empty()) cout << "S is empty\n"; // S is empty
18      cout << S.top() << '\n'; // runtime error 발생
19  }
```

0x03 연습문제

BOJ 10828번: 스택

https://github.com/blisstoner/basic-algo-lecture-material/blob/master/0x05/10828_1.cpp

```
01 #include <bits/stdc++.h>
02 using namespace std;
03
04 int main(void) {
05     ios::sync_with_stdio(0);
06     cin.tie(0);
07     int n;
08     cin >> n;
09     stack<int> S;
10     while(n--){ // n번 반복
11         string c;
12         cin >> c;
13         if(c=="push"){
14             int t;
15             cin >> t;
16             S.push(t);
17         }
```

```
18     else if(c=="pop"){
19         if(S.empty())
20             cout << -1 << '\n';
21         else{
22             cout << S.top() << '\n';
23             S.pop();
24         }
25     }
26     else if(c=="size")
27         cout << S.size() << '\n';
28     else if(c=="empty")
29         cout << (int)S.empty() << '\n';
30     else{ // top
31         if(S.empty())
32             cout << -1 << '\n';
33         else cout << S.top() << '\n';
34     }
35 }
36 }
```

0x03 연습문제

BOJ 10828번: 스택

https://github.com/blisstoner/basic-algo-lecture-material/blob/master/0x05/10828_2.cpp

```
01 #include <bits/stdc++.h>
02 using namespace std;
03
04 const int MX = 1000005;
05 int dat[MX];
06 int pos;
07
08 void push(int val){
09     dat[pos++] = val;
10 }
11
12 void pop(){
13     pos--;
14 }
15
16 int top(){
17     return dat[pos-1];
18 }
```

```
19 int main(void) {
20     ios::sync_with_stdio(0);
21     cin.tie(0);
22     int n;
23     cin >> n;
24     while(n--){ // n번 반복
25         string c;
26         cin >> c;
27         if(c=="push"){
28             int t;
29             cin >> t;
30             push(t);
31         }
32         else if(c=="pop"){
33             if(pos == 0)
34                 cout << -1 << '\n';
35             else{
36                 cout << top() << '\n';
37                 pop();
38             }
39         }
40     }
```

```
40         else if(c=="size")
41             cout << pos << '\n';
42         else if(c=="empty")
43             cout << (int)(pos == 0) << '\n';
44         else{ // top
45             if(pos == 0)
46                 cout << -1 << '\n';
47             else cout << top() << '\n';
48         }
49     }
50 }
```


강의 정리

