General Notes

- Read from / Write to files:

  freopen("FILE_NAME.FILE_EXTENSION","r",stdin);
  // cin will read from file instead of the console

  freopen("FILE_NAME.FILE_EXTENSION","w",stdout);
  //cout will write to file instead of console window

- Print answer mod (%) 10^9 + 7

  What is mod?
  1%2=
  2%5=
  3%2=
  10%5=
  8%7=

- Large input and output:

  1) use scanf & printf
  2) scanf and printf won't work:
  `std::ios::sync_with_stdio(false); cin.tie(0);`

Stack (Template Class)

Where to find functions?
http://www.cplusplus.com/reference/stack/stack/

Important Functions:
push O(1)
pop O(1)
top O(1)
empty O(1)
size O(1)

```
stack<int> st;
st.push(5);
st.push(4);
st.push(3);
while(!st.empty())
{
	cout<<st.top()<<endl;
	st.pop();
}
```

Output: 3 4 5

Queue (Template Class)

Where to find functions?
http://www.cplusplus.com/reference/queue/queue/

Important Functions:
push O(1)
pop O(1)
front O(1)
empty O(1)
size O(1)
back O(1)

```
queue<int> q;
q.push(5);
q.push(4);
q.push(3);
while(!q.empty())
{
	cout<<q.front()<<endl;
	q.pop();
}
```
Output: 5 4 3

Priority Queue / Heap (Template Class)

Where to find functions?
http://www.cplusplus.com/reference/queue/priority_queue/

A queue that always stores the maximum value as the top of the queue.

Important Functions:
insert O(log n)
pop O(log n)
top O(1)
empty O(1)
size O(1)

```
prioirity_queue<int> q;
q.insert(1);
q.insert(40);
q.insert(3);
while(!q.empty())
{
	cout<<q.front()<<endl;
	q.pop();
}
```

Output: 40 3 1

Guess the data structure:
https://uva.onlinejudge.org/index.php?option=onlinejudge&page=show_problem&problem=3146