**link=**[**https://www.youtube.com/watch?v=RuH9-t2vDNc&list=PLoa\_roVVsxA1CJu4DsOljb9d7FJkMCynM&index=13**](https://www.youtube.com/watch?v=RuH9-t2vDNc&list=PLoa_roVVsxA1CJu4DsOljb9d7FJkMCynM&index=13)

**[L1]Class - 13 ( Almost everything about STL Priority queue & Practice problem ) [Bangla]**

Class Video link : [https://youtu.be/RuH9-t2vDNc](https://l.facebook.com/l.php?u=https%3A%2F%2Fyoutu.be%2FRuH9-t2vDNc%3Ffbclid%3DIwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw&h=AT2fsTjGap_xkf7siPP5apXABwrUf9BohPiAaM-F9y_m5cWn6xIrhcV8aRFaG23df-VjkJAOlwlysIj64MuUE_BP0mtGxFx2uIMHTLdCpWkP-2CAmYWjAsjjsNux&__tn__=-UK-R&c%5B0%5D=AT2lOBghPNB4AgoJqoqgTypjWVsX4ZnoQ4HcAJjdcgddDoWXQ1T0DgvAHLxa2lLMZMtNGIO3rmr5reCfH6GH7b3y9tXZD0CUAM7oxPNYeM2z6MW_832DdJqg1nhQoaYe6UmBmXq6oN-RY4Om00EFC4HgyaMmwsLF1h5Fy8qkVudkrmu8A8ennyA5ng)

Discussed topics :

1) STL Priority Queue

2) Monk and Multiplication(HackerEarth)

Link : [https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-multiplication/description/](https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-multiplication/description/?fbclid=IwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw)

My Code : [https://paste.ubuntu.com/p/N3rsVVg8zW/](https://paste.ubuntu.com/p/N3rsVVg8zW/?fbclid=IwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw)

3) Monk And Champions League ( HackerEarth )

Link : [https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-champions-league/description/](https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-champions-league/description/?fbclid=IwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw)

My Code : [https://paste.ubuntu.com/p/p94nH4ZgTF/](https://l.facebook.com/l.php?u=https%3A%2F%2Fpaste.ubuntu.com%2Fp%2Fp94nH4ZgTF%2F%3Ffbclid%3DIwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw&h=AT0XsFgtzf-CtPlnQgIQTjCbMAzXmzTsQwuiC67c24QNrIHMXidhWb_R7i-GqDznM-keEI6G0GmGbTynwVlJkTsxA0AR9vR3GsWg7UB_ntyYVF-ed2JIQ-vH3Nog&__tn__=-UK-R&c%5B0%5D=AT2lOBghPNB4AgoJqoqgTypjWVsX4ZnoQ4HcAJjdcgddDoWXQ1T0DgvAHLxa2lLMZMtNGIO3rmr5reCfH6GH7b3y9tXZD0CUAM7oxPNYeM2z6MW_832DdJqg1nhQoaYe6UmBmXq6oN-RY4Om00EFC4HgyaMmwsLF1h5Fy8qkVudkrmu8A8ennyA5ng)

4) REDARR2 - Reduce the array ( Spoj )

Link : [https://www.spoj.com/problems/REDARR2/](https://www.spoj.com/problems/REDARR2/?fbclid=IwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw)

My Code : [https://paste.ubuntu.com/p/SMHRXswyks/](https://paste.ubuntu.com/p/SMHRXswyks/?fbclid=IwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw)

5) T-shirt buying (Codeforces)

Link : [https://codeforces.com/contest/799/problem/B](https://codeforces.com/contest/799/problem/B?fbclid=IwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw)

My Code : [https://codeforces.com/contest/799/submission/90402051](https://codeforces.com/contest/799/submission/90402051?fbclid=IwAR3_AVk3GIc7_ThVoeZVeIHHlPuFIrb_HTpaFD_WHsJbrQy4rKmhmr9BfFw)

Class Tasks :

All the problems discussed in class are class tasks.

***#include<bits/stdc++.h>***

**using namespace std;**

***#define hamid() ios\_base::sync\_with\_stdio(0);cin.tie(0);cout.tie(0);***

***#define endl '\n';***

**int main()**

**{**

**hamid();**

**priority\_queue<int> p;**

**p.push(1);**

**p.push(2);**

**p.push(3);**

**p.push(4);**

**cout<<"Size:"<<p.size()<<endl;//4**

**cout<<p.top()<<endl;//4**

**p.pop();**

**cout<<p.top()<<endl;//3**

**cout<<endl;**

**p.push(1);**

**p.push(2);**

**p.push(3);**

**p.push(4);**

**cout<<"Element in :";**

**while (!p.empty() ){**

**cout<<p.top()<<" ";**

**p.pop();**

**}//4 3 3 2 2 1 1**

**cout<<endl;**

**cout<<"Size:"<<p.size()<<endl;//0**

**cout<<endl;**

**cout<<"Comparator use: because acending order:"<<endl;**

**priority\_queue<int,vector<int>,greater<int>>q;**

**q.push(5);**

**q.push(1);**

**q.push(2);**

**q.push(4);**

**q.push(2);**

**q.push(3);**

**cout<<"Size:"<<q.size()<<endl;**

**while (!q.empty()){**

**cout<<q.top()<<" ";**

**q.pop();**

**}//1 2 2 3 4 5**

**cout<<endl;**

**cout<<endl;**

**cout<<"Pair comparator use:"<<endl;**

**priority\_queue<pair<int,int>,vector<pair<int,int>>,greater<pair<int,int>>> q1;**

**q1.push({1,2});**

**q1.push({2,3});**

**q1.push({2,4});**

**q1.push({4,4});**

**q1.push({3,4});**

**while (!q1.empty()){**

**cout<<q1.top().first<<" "<<q1.top().second<<endl;**

**q1.pop();**

**}**

**/\***

**\* 1 2**

**\* 2 3**

**\* 2 4**

**\* 3 4**

**\* 4 4**

**\*/**

**cout<<"Size:"<<q1.size()<<endl;//0**

**cout<<endl;**

**cout<<"Only pair use:"<<endl;**

**priority\_queue<pair<int,int>> q2;**

**q2.push({1,2});**

**q2.push({2,3});**

**q2.push({2,4});**

**q2.push({4,4});**

**q2.push({3,4}) ;**

**while (!q2.empty()){**

**cout<<q2.top().first<<" "<<q2.top().second<<endl;**

**q2.pop();**

**}**

**/\***

**\* 4 4**

**\* 3 4**

**\* 2 4**

**\* 2 3**

**\* 1 2**

**\*/**

**return 0;**

**}**

**"C:\Users\Md.Hamid Hosen\CLionProjects\untitled2\cmake-build-debug\untitled2.exe"**

**Size:4**

**4**

**3**

**Element in :4 3 3 2 2 1 1**

**Size:0**

**Comparator use: because acending order:**

**Size:6**

**1 2 2 3 4 5**

**Pair comparator use:**

**1 2**

**2 3**

**2 4**

**3 4**

**4 4**

**Size:0**

**Only pair use:**

**4 4**

**3 4**

**2 4**

**2 3**

**1 2**

**Process finished with exit code 0**

***#include<bits/stdc++.h>***

**using namespace std;**

***#define hamid() ios\_base::sync\_with\_stdio(0);cin.tie(0);cout.tie(0);***

***#define endl '\n';***

**int main()**

**{**

**hamid();**

**priority\_queue<pair<int,int>> q2;**

**q2.push({1,-2});**

**q2.push({2,-3});**

**q2.push({2,-4});**

**q2.push({4,-4});**

**q2.push({3,-4}) ;**

**while (!q2.empty()){**

**cout<<q2.top().first<<" "<<q2.top().second<<endl;**

**q2.pop();**

**}**

**/\***

**\* 4 -4**

**\* 3 -4**

**\* 2 -3**

**\* 2 -4**

**\* 1 -2**

**\*/**

**cout<<endl;**

**cout<<"contest program :for 1st value grater and 1st value equal then second value small:"<<endl;**

**priority\_queue<pair<int,int>> q;**

**q.push({1,-2});**

**q.push({2,-3});**

**q.push({2,-4});**

**q.push({4,-4});**

**q.push({3,-4}) ;**

**while (!q.empty()){**

**cout<<q.top().first<<" "<<q.top().second\*-1<<endl;**

**q.pop();**

**}**

**/\***

**\* 4 4**

**\* 3 4**

**\* 2 3**

**\* 2 4**

**\* 1 2**

**\*/**

**cout<<endl;**

**return 0;**

**}**

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**4 -4**

**3 -4**

**2 -3**

**2 -4**

**1 -2**

**contest program :for 1st value grater and 1st value equal then second value small:**

**4 4**

**3 4**

**2 3**

**2 4**

**1 2**

**Process finished with exit code 0**

**problem link=**[**https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-multiplication/description/**](https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-multiplication/description/)

**code link=**[**https://paste.ubuntu.com/p/N3rsVVg8zW/**](https://paste.ubuntu.com/p/N3rsVVg8zW/)

***#include<bits/stdc++.h>***

**using namespace std;**

***#define hamid() ios\_base::sync\_with\_stdio(0);cin.tie(0);cout.tie(0);***

***#define endl '\n';***

**int main()**

**{**

**hamid();**

**priority\_queue<int>q;**

**int t;**

**cin>>t;**

**int a[t];**

**for(int i=0;i<t;i++){**

**cin>>a[i];**

**q.push(a[i]);**

**if(q.size()>=3){**

**int a1=q.top();**

**q.pop();**

**int a2=q.top();**

**q.pop();**

**int a3=q.top();**

**q.pop();**

**cout<<1LL \*a1\*a2\*a3<<endl;**

**q.push(a1);**

**q.push(a2);**

**q.push(a3);**

**}else{**

**cout<<"-1"<<endl;**

**}**

**}**

**return 0;**

**}**

**//over all complexity=O(nlog2(n))**

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**5**

**1**

**2**

**3**

**4**

**5**

**-1**

**-1**

**6**

**24**

**60**

**Process finished with exit code 0**

**problem link=**[**https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-champions-league/submissions/**](https://www.hackerearth.com/practice/data-structures/trees/heapspriority-queues/practice-problems/algorithm/monk-and-champions-league/submissions/)

**code link =**[**https://paste.ubuntu.com/p/p94nH4ZgTF/**](https://paste.ubuntu.com/p/p94nH4ZgTF/)

***#include<bits/stdc++.h>***

**using namespace std;**

***#define hamid() ios\_base::sync\_with\_stdio(0);cin.tie(0);cout.tie(0);***

***#define endl '\n';***

**int main()**

**{**

**hamid();**

**int m,n,x;**

**priority\_queue<int>q;**

**cin>>m>>n;**

**while (m--){**

**cin>>x;**

**q.push(x);**

**}**

**long long maxSum=0;**

**for(int i=0;i<n;i++){**

**if(!q.empty()){**

**int a=q.top();**

**q.pop();**

**maxSum+=a;**

**a--;**

**if(a>0){**

**q.push(a);**

**}**

**}**

**}**

**cout<<maxSum<<endl;**

**return 0;**

**}**

**"C:\Users\Md.Hamid Hosen\CLionProjects\untitled2\cmake-build-debug\untitled2.exe"**

**3 4**

**1 2 4**

**11**

**Process finished with exit code 0**

**problem link=**[**https://www.spoj.com/problems/REDARR2/**](https://www.spoj.com/problems/REDARR2/)

**code link=**[**https://paste.ubuntu.com/p/SMHRXswyks/**](https://paste.ubuntu.com/p/SMHRXswyks/)

***#include<bits/stdc++.h>***

**using namespace std;**

***#define hamid() ios\_base::sync\_with\_stdio(0);cin.tie(0);cout.tie(0);***

***#define endl '\n';***

***#define ll long long***

**int main()**

**{**

**hamid();**

**int T;**

**cin>>T;**

**while (T--){**

**int n;**

**cin>>n;**

**priority\_queue<int,vector<int>,greater<int>>q;**

**while (n--){**

**int x;**

**cin>>x;**

**q.push(x);**

**}**

**ll minSum=0;**

**while (q.size()>1){**

**ll a=q.top();**

**q.pop();**

**ll b=q.top();**

**q.pop();**

**q.push(a+b);**

**minSum+=(a+b);**

**}**

**cout<<minSum<<endl;**

**}**

**return 0;**

**}**

**"C:\Users\Md.Hamid Hosen\CLionProjects\untitled2\cmake-build-debug\untitled2.exe"**

**2**

**4**

**1 6 3 20**

**3**

**2 2 2**

**44**

**10**

**Process finished with exit code 0**

**problem link=**[**https://codeforces.com/contest/799/problem/B**](https://codeforces.com/contest/799/problem/B)

**code link=**[**https://codeforces.com/contest/799/submission/90402051**](https://codeforces.com/contest/799/submission/90402051)

***#include<bits/stdc++.h>***

**using namespace std;**

***#define hamid() ios\_base::sync\_with\_stdio(0);cin.tie(0);cout.tie(0);***

***#define endl '\n';***

***#define ll long long***

**const int mx=2e5+123;**

**int a[mx],b[mx],p[mx];**

**int main()**

**{**

**hamid();**

**int n;**

**cin>>n;**

**for(int i=1;i<=n;i++) cin>>p[i];**

**for(int i=1;i<=n;i++) cin>>a[i];**

**for(int i=1;i<=n;i++) cin>>b[i];**

**priority\_queue<int,vector<int>,greater<int>> q[5][5];**

**for(int i=1;i<=n;i++) q[a[i]][b[i]].push(p[i]);**

**int m;**

**cin>>m;**

**while (m--){**

**int c;**

**cin>>c;**

**int ans=INT\_MAX,f,b;**

**for(int i=1;i<=3;i++){**

**if(!q[c][i].empty() && q[c][i].top()<ans){**

**ans=q[c][i].top();**

**f=c,b=i;**

**}**

**}**

**for (int i=1;i<=3;i++) {**

**if ( !q[i][c].empty() && q[i][c].top() < ans ) {**

**ans = q[i][c].top();**

**f = i, b = c;**

**}**

**}**

**if(ans==INT\_MAX) ans=-1;**

**else{**

**q[f][b].pop();**

**}**

**cout<<ans<<" ";**

**}**

**cout<<endl;**

**return 0;**

**}**

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**5**

**300 200 400 500 911**

**1 2 1 2 3**

**2 1 3 2 1**

**6**

**2 3 1 2 1 1**

**200 400 300 500 911 -1**

**Process finished with exit code 0**