**Binary search first occurrence**

**ll bs(ll l,ll r,ll val,vector<ll>&v)**

**{**

**ll last=-1;**

**while(l<=r)**

**{**

**ll mid=(l+r)/2;**

**if (val<=v[mid])**

**{**

**last=mid;**

**r=mid-1;**

**}**

**else {l=mid+1;}**

**}**

**return last;**

**}**

**Binary search last occurrence**

**ll bs(ll l,ll r,ll val,vector<ll>&v)**

**{**

**ll last=-1;**

**while(l<=r)**

**{**

**ll mid=(l+r)/2;**

**if (val<=v[mid])**

**{**

**last=mid;**

**r=mid-1;**

**}**

**else {l=mid+1;}**

**}**

**return last;**

**}**

**Binary search on function**

**Binary search on doubles**

**float l = 0.0f, r = 1e14f;**

**for (int i = 0; i < iteration\_count && l + eps < r; ++i)**

**{**

**float mid = 0.5f \* (l + r);**

**if (check(mid))**

**r = mid;**

**else**

**l = mid;**

**}**