

## Homework-2 Solutions

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Honor Code: I promise that I finished the homework solutions on my own without copying other people's work.

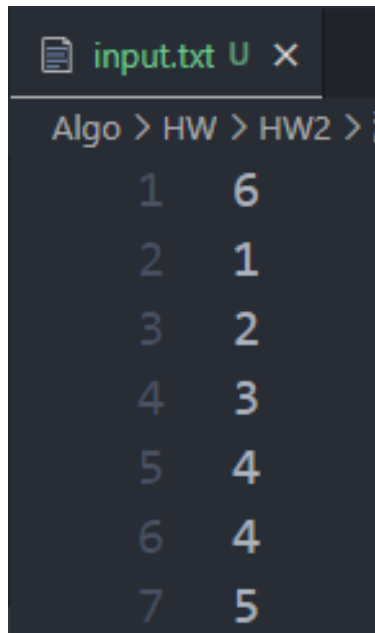
pdf 中所示源码均附于 src/文件夹中

## 2-1 求众数

代码

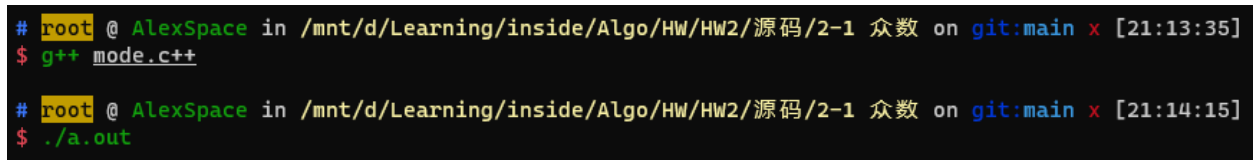
```
1  #include<cstdio>
2  #include <iostream>
3  #include <cstring>
4  #include <algorithm>
5
6  using namespace std;
7  int a[100000], max_conts = 0;
8
9  void Mode(int a[], int l, int r, int& mode, int& times){
10     if (r - l + 1 <= max_conts) return;
11     int mid = l + r >> 1;
12     int midnum = a[mid], i = mid, j = mid;
13     // 计算众数长度
14     while(a[i] == midnum && i >= l) i--;
15     while(a[j] == midnum && j <= r) j++;
16     if(max_conts < j - i - 1){
17         max_conts = j - i - 1;
18         mode = a[mid];
19     }
20     Mode(a, l, mid, mode, times);
21     Mode(a, mid + 1, r, mode, times);
22     times = max_conts;
23     return;
24 }
25
26 int main()
27 {
28     freopen("input.txt", "r", stdin);
29     freopen("output.txt", "w", stdout);
30     int n; cin >> n;
31     for (int i = 0; i < n; i++) cin >> a[i];
32     sort(a, a+n);
33     int m, t;
34     Mode(a, 0, n-1, m, t);
35     cout << m << endl << t;
36 }
37
```

输入



```
input.txt U X
Algo > HW > HW2 > 2-1
1 6
2 1
3 2
4 3
5 4
6 4
7 5
```

运行结果



```
# root @ AlexSpace in /mnt/d/Learning/inside/Algo/HW/HW2/源码/2-1 众数 on git:main x [21:13:35]
$ g++ mode.cpp
# root @ AlexSpace in /mnt/d/Learning/inside/Algo/HW/HW2/源码/2-1 众数 on git:main x [21:14:15]
$ ./a.out
```

输出



```
output.txt U X
Algo > HW > HW2 > 源码 > 2-1
1 4
2 2
```

## 2-3 半数集

代码

```
Algo > HW > HW2 > 源码 > 2-3 半数集 > C++ halfset.c++
1  #include<cstdio>
2  #include <iostream>
3  #include <cstring>
4  #include <algorithm>
5
6  using namespace std;
7
8  int HalfSet(int n){
9      if(n == 1) return 1;
10     int sum = 0;
11     for(int i = 1; i <= n/2; i++) sum += HalfSet(i);
12     return sum + 1;
13 }
14
15 int main()
16 {
17     freopen("input.txt","r",stdin);
18     freopen("output.txt","w",stdout);
19     int n; cin >> n;
20     cout << HalfSet(n);
21     return 0;
22 }
```

输入

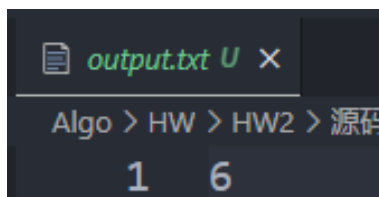
```
input.txt U X
Algo > HW > HW2 >
1  6
```

## 运行结果

```
# root @ AlexSpace in /mnt/d/Learning/inside/Algo/HW/HW2/源码/2-3 半数集 on git:main x [21:52:26]
$ g++ halfset.cpp

# root @ AlexSpace in /mnt/d/Learning/inside/Algo/HW/HW2/源码/2-3 半数集 on git:main x [21:52:40]
$ ./a.out
```

## 输出



## Other things

$\text{\LaTeX}$  code refer to these things and was compiled on texlive2020.

- [UCB-CS70's given homework template.](#)
- [A free website useful to edit  \$\text{\LaTeX}\$  formula code.](#)

Thanks for your correcting and grading :).