Competitive Programming

Lec 8
Hashing

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Hashing

- Key, value

[‘bob’ : ‘23 year’]

- Two ways to handle collision

1. Open addressing
2. Chaining

C++ STL for Hash

- `set < int > s;`
  `// ordered`
- `multiset < int > s;`
  `// ordered`
- `map < int, int > m;`
  `// ordered`
- `unordered_map < int, int > m;`
- Unordered_map are faster then map because keys are not sorted.
- `multimap < int, int > m;`
  `// ordered`
- `unordered_set < int > s;`
  `// unordered`

C++ STL for Hash

- `map < int, int > m;`

- To traverse keys in map, we need iterator

- `map < int, int > :: iterator it;`

- ```
  for (it = m.begin(); it != m.end(); it++) {
      cout << it->first << ' '
           it->second << endl;
  }
  ```
  ```

Buy1-Get1

One day Alice visited Byteland to purchase jewels for her upcoming wedding anniversary. In Byteland, every Jewelry shop has their own discount methods to attract the customers. One discount method called Buy1-Get1 caught Alice's attention. That is, Alice buys one jewel, then she can get one additional jewel with the same color without charge by Buy1-Get1. Alice lists the needed jewels as a string S, each letter denotes one jewel, and the same letters denote the same colors of jewels, and the different letters denote the different colors of jewels. The cost of each jewel is 1. Your task is to calculate the minimum cost for getting all the jewels Alice listed.

Input:	Output:
4 ssss ssas sa s	2 3 2 1

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Winner

The winner of the card game popular in Berland "Berlogging" is determined according to the following rules. If at the end of the game there is only one player with the maximum number of points, he is the winner. The situation becomes more difficult if the number of such players is more than one. During each round a player gains or loses a particular number of points. In the course of the game the number of points is registered in the line "name score", where name is a player's name, and score is the number of points gained in this round, which is an integer number. If score is negative, this means that the player has lost in the round. So, if two or more players have the maximum number of points (say, it equals to m) at the end of the game, than wins the one of them who scored at least m points first. Initially each player has 0 points. It's guaranteed that at the end of the game at least one player has a positive number of points.

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Winner

Input: 3 mike 3 andrew 5 mike 2	Output: andrew
Input: 3 andrew 3 andrew 2 mike 5	Output: andrew

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Merge K Sorted Lists

Merge k sorted linked lists and return it as one sorted list.

Example :

1 -> 10 -> 20
4 -> 11 -> 13
3 -> 8 -> 9

will result in

1 -> 3 -> 4 -> 8 -> 9 -> 10 -> 11 -> 13 -> 20

Solution

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Copy List

A linked list is given such that each node contains an additional random pointer which could point to any node in the list or NULL.
Return a deep copy of the list.
Example
Given list

```
   1 -> 2 -> 3
```

with random pointers going from

```
  1 -> 3
  2 -> 1
  3 -> 1
```

You should return a deep copy of the list. The returned answer should not contain the same node as the original list, but a copy of them. The pointers in the returned list should not link to any node in the original input list.

Solution

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Homework

Is your horseshoe on the other hoof?	Easy, Codeforces
Valid Sudoku	Easy, interviewbit
Geometric Progression	Medium, Codeforces
Distinct Numbers in Window	Medium, interviewbit, Very Important for interview