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1  /** IUT 2017 - Paying Bills
2  You are given N coins of value C1, C2, ... , CN and was told to pay some pending bills on M
3  different stores. Bill of i-th store is Bi. You have to find out the minimum number of coins
4  needed to pay all the bills.
5
6  There will be T (≤1000) test cases. Each case starts with a positive integer N (≤15) denoting the
7  number of coins. Then comes the value of each coin Ci (1≤Ci≤1000). Next, there will be an
8  integer M (≤N) denoting the number of stores followed by the bill of each store Bi (1≤Bi≤1000).
9
10 Print case number and the minimum number of coins needed. Print -1 if it is not possible to
11 pay all the bills with given coins.
12 Sample Input           Sample Output
13 2                       Case 1: 3
14 6                       Case 2: -1
15 1 2 3 4 5 6
16 2
17 9 3
18 6
19 1 2 3 4 5 6
20 3
21 4 4 4
22 */ Sample Code(TIME-1.3S):
23 int n,m,coin[20],bill[20],dp[16][(1<<15)+5]; vector<int>taka[1009];
24 int cnt(int mask){
25     int one=0;
26     for(int i=0; i<n; i++){
27         if(mask&(1<<i)) one++;
28     }
29     return one;
30 }
31 int take(int mask){
32     int sum=0;
33     for(int i=0; i<n; i++){
34         if(mask & (1<<i)) sum += coin[i];
35     }
36     return sum;
37 }
38 int fun(int shop,int mask){
39     if(shop==m) return cnt(mask);
40     int &ret=dp[shop][mask];
41     if(ret!=-1) return ret;
42     ret=n+12;
43     int sz=taka[bill[shop]].size();
44     for(int i=0; i<sz; i++) {
45         int need = taka[bill[shop]][i];
46         if((mask & need)==0) {
47             ret=min(ret,fun(shop+1, mask|need));
48         }
49     }
50     return ret;
51 }
52 int main(){
53     int t; scanf("%d", &t);
54     for(int ks=1; ks<=t; ks++){
55         scanf("%d", &n); for(int i=0; i<n; i++) scanf("%d", &coin[i]);
56         scanf("%d", &m); for(int i=0; i<m; i++) scanf("%d", &bill[i]);
57
58         for(int i=1; i<(1<<n); i++){
59             int ta = take(i);
60             if(ta<=1000) taka[ta].push_back(i);
61         }
62         memset(dp,-1,sizeof(dp));
63         int ans=fun(0,0);
64         if(ans>n) ans=-1;
65         printf("Case %d: %d\n",ks,ans);
66         for(int i=0; i<1003; i++) taka[i].clear();
67     }
68 }

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