Not One of Them	Topic-related tasks
Costly Binary Search	
Log Drivin' Hirin'	
City Hall	
Harbingers	
Camel and Oases	Still DP
Boxes	
Shortsighted	“Stolen” from a contest, sorted by (expected) hardest to easiest
Jumping Stones	
Sending Blessings	
Go To Goal	
Healthy Lifestyle	
Frequent Alphabet	

I	Not One of Them	Topic-related tasks
C	Costly Binary Search	
B	Log Drivin' Hirin'	
D	City Hall	
K	Harbingers	
F	Camel and Oases	Still DP
M	Boxes	
E	Shortsighted	“Stolen” from a contest, sorted by (expected) hardest to easiest
L	Jumping Stones	
J	Sending Blessings	
A	Go To Goal	
H	Healthy Lifestyle	
G	Frequent Alphabet	

as promised, one more task that has not been discussed yesterday

IOI 2014 Holiday (reduced)

given N cities in a line. City i has value A[i]. You start at city 0. In one day, you can either move to neighbouring city or take the value (at most once) of the current city.

For each d=0..2N, determine the maximum total value you can get if you have d days

$1 \leq N \leq 100k$

find the value of single d can be done in $O(N \lg N)$ by iterating which rightmost city to be visited.

let opt(d) = the farthest city you visit when you have d days in the optimal solution.

we have $\mathrm{opt}(d) \leq \mathrm{opt}(d+1)$

Graph Connectivity

Jonathan Irvin Gunawan

let’s practice some tasks

IOI 2015 Practice Graph

given a graph and two nodes A, B. determine how many vertices which, if removed, disconnects A and B

$1 \leq N \leq 100.000$

$0 \leq M \leq 200.000$

run DFS tree with root = A

the possible candidate vertices are vertices in the path from A to B node u is an answer if

let's say v is a child of u where
v=ancestor(B).
dfs_low[v] ≥ dfs_num[u]

more

https://www.hackerearth.com/practice/algorithms/graphs/strongly-connected-components/practice-problems/algorithm/a-walk-to-remember-qualifier2/

given a directed graph, for each node, determine whether there is a cycle staring from the node

$1 \leq N \leq 100.000$
$1 \leq M \leq 200.000$

just check for each node whether that node is alone in the SCC one more

http://acm.timus.ru/forum/thread.aspx?id=22089&upd=633721365703625916

given a directed graph, determine which nodes can go to ALL other nodes.

$1 \leq N \leq 100.000$

$0 \leq M \leq 200.000$

so the observation is, if a and b is in one SCC, then the set of vertices that can be visited by a and b is exactly the same.

therefore, run SCC, group nodes in one SCC to be one node.

There is an edge from SCC node a to b <=> there is an edge from node u to v where u is in a and v is in b

this technique is quite common. let's name it SCC graph now we got a DAG (otherwise SCC is not optimal)

then, just choose a candidate node (vertex without an indegree), then check whether that node can visit all other nodes last

ICPC Jakarta Regional 2012
Unique Path

given a graph, find the number of pair of nodes with unique path

$2 \leq N \leq 10k$

$1 \leq M \leq 100k$

EOF

Q&A?