-Morass-'s blog

Problem Topics

By -Morass-, history, 5 months ago,

Good Day to you!

I've been asked to make some topic-wise list of problems I've solved. Even though I couldn't involve all problems, I've tried to involve at least "few" problems at each topic I thought up (I'm sorry if I forgot about something "easy"). I've alredy made such list once anyway I've tried to include more problems now — so here it is:

- aho
- automat
- belman-ford
- bfs
- bfs-grid
- big
- binary_search
- bits
- bitset
- bridges
- brute-force
- centroid
- coloring
- combinatorics
- constructive
- dfs
- digits
- dijkstra
- divide_conquer
- divisors
- dp
- dsu
- euler_function
- euler_tour
- factorization
- fenwick
- fft
- flow
- flow-matching-like
- floyd-warshall
- friedvaldAlgorithm
- game_theory
- gauss
- geometry
- graph
- greedy
- hash
- hull
- chess
- implementation
- inclusion-exclusion
- interactive
- isomorphism
- josephus

KMP
lca
lcs_subsequence
lct
lis
matching
matrix
matrix_exponentiation
mcmf
median
meet_in_middle
MO
next
np-hard
number_rectangle
number_theory
observation
oeis
offline
palindromes
patter-matching
permutations
persistent_segment_tree
preprocess
prime-count
prime-testing
probability
recursion
RMQ
rope
scc
segment_tree
sequences
sieve
simulation
sorting
spanning_tree
spfa
sqrt
stl
strings
suffix_array
ternary_search
topo
treap
tree
tree-dp
trie_bit
trie_string
TSP
two-pointers
wavelet_tree
Zfunction
2SAT

Finally if you would like to add some problem to the list — even though I would be glad, please do so only in case of:

1. It is very interesting
2. There is nothing, or low number of problems in the topic
3. You add it in "bigger amount" at once

Thank you.

Offcourse if you have any remarks, questionns or requests, don't hesitate to ask.

PS: I'm sorry but there might be some duplicities. In that case, either report it or ignore it (unless they are in different topics, then it have reason :))

Good Luck & Have Nice Day

all problems, algorithms blog list, #algorithms

+425 -Morass- 5 months ago 61

Comments (61)

Write comment?

exelover

5 months ago, # | +5

Thank You :)

→ Reply

SYury

5 months ago, # | +18

http://www.spoj.com/problems/PAIRDIV/ (6) //cyka möbius -_-

It seems that you don't like Möbius inversion much.

→ Reply

-Morass-

5 months ago, # ^ | +1

Hello, Yes,

I'm not mathematician and it seems slightly like magic to me :'(I find it hard somehow :/

→ Reply

VastoLorde95

5 months ago, # | +5

Are the numbers in the parenthesis your judgement of how difficult each problem is?

→ Reply

-Morass-

5 months ago, # ^ | +9

Good day to you,

yes, exactly as you say. But as it is stated — it is my opinion so it might be "a little bit" off :)

→ Reply

kazuma_desu

5 months ago, # | +10

I find it funny that there is a topic "oeis". xD

→ Reply

-Morass-

5 months ago, # ^ | +4

Good day to you,

well right :D .. it is mostly math.

It is might be used slightly in "different" manner then normal math problems. I.e. you can brute-force small test-cases only and then "google the rest" .. So math but basically different approach ^_^

→ Reply

4 months ago, # | +10

Can you please tell what are the problems from LA are?? i mean what is LA?? i

acraider

have never heard of it.

→ Reply

-Morass-

4 months ago, # ^ | ☆ +3

Good day to you,

sure: LA stands for Live Archive — it is a judge which stores most of the problems from Regional Contests + World Finals

→ Reply

acraider

4 months ago, # ^ | ☆ ← Rev. 2 +5

Ok... never came across the acronym before :).Thnx for the prompt reply.

→ Reply

Target2018

4 months ago, # | ☆ +5

what is "big"?

→ Reply

-Morass-

4 months ago, # ^ | ☆ ← Rev. 2 +8

Good day to you,

This topic stands for **Big Integer** — so problems with numbers which doesn't fit in 2^{64} :)

Have Nice Day ^-^

→ Reply

shashwatchandra

4 months ago, # ^ | ☆ +5

I think you mean to say Integer.

→ Reply

-Morass-

4 months ago, # ^ | ☆ 0

Yes, thank you — fixed this :)

→ Reply

sahil070197

4 months ago, # | ☆ +5

I've got a nice problem for **tree-dp**

Torque and edges

→ Reply

segwit

4 months ago, # | ☆ ← Rev. 2 +5

are all the questions tough or are some questions easy, how does a pupil like me approach those questions??? I simply want to ask that how do i use this resource for optimum benefit!!!

→ Reply

-Morass-

4 months ago, # ^ | ☆ 0

Good day to you,

imho there shall be easy questions too. Some of them are marked by a number (by which I've tried to estimate the difficulty). So you might try (firstly) problems marked with lower numbers (lets say lesser/equal 3 or 4)

Wish you a nice day,

~/Morass

→ Reply

→ Reply

segwit

4 months ago, # ^ | ☆ +5

thank you for such a quick reply. is the estimate out of 10.

→ Reply

-Morass-

4 months ago, # ^ | ☆ 0

Yes it is out of 10 (even thought — I think I've never used such big number :P) [but again.. it is just estimation, so might not be absolutely correct :)]

→ Reply

segwit

4 months ago, # ^ | ☆ +5

can you give an estimate that what will be my rating like if I solve questions till level a)5 b)6 c)7 d)8(will take a long time to reach here.)

→ Reply

4 months ago, # ^ | ☆ +1

Unfortunatelly it is not much possible imho :'(

Firstly, even person with lover rating can solve hard problem. It will just take him more time to come-up with solution and/or to code the solution.

Secondly some problems fit to some people more — so it varies.

Another thing is that many problems here are algorithmic. So sometime the hardest part might be algorithm itself. It indeed might be hard to code — and even more difficult to come with. On the other hand, it is not that hard to find such algorithm somewhere on google, learn it, code it.. and then it colsts "nothing" when you use it for the second time (even thought It costed many hours for the first time).

-Morass-

So in my opinion, I can't say it... Anyway if you would be able to do that fast (so it would easily fit into codeforces contest) the rating might possibly probabli be somewhere between purpble to red (the range you told)

Also note, that codeforces stile problems might be different from "ACM"-stlye problems... and also from some direct-method SPOJ problems.

So well, sorry this didn't help you much, but that is my opinion :)

→ Reply

segwit

4 months ago, # ^ | ☆ +5

No No, infact I WANTED an answer to my silly question but you gave me the answer I NEEDED to progress further, thank you so much!!

→ Reply

17_38_98_KB

4 months ago, # | ☆ +5

Sir, what do you think about the book — competitive programming 3 -by steven halim and felix halim? If I solve all the problems mentioned in that book will I improve? If yes, then how much?

→ Reply

-Morass-

4 months ago, # ^ | ☆ 0

Good day to you,

Well firstly, I've not read the book so not sure if my answer will be "valid". Anyway I know some people who did so (and I've also heard a little bit about it and so on):

The book introduces most of the algorithms which are considered "basic" so imho it is "almost necessary" to know these algorithms as "ground" for almost any (at least a little bit) advanced skill-level. I heard it is a great book (the algorithms are well described there) so it is worth giving it a try (well you shall learn the algorithm somewhere — so why not from here?). Anyway what I also think is, that it won't **ensure** you any of the skill-levels: There are many more thinks, which "shuffled" together makes you good at CP and the knowledge of algorithms is "only" (but it is imho important) one of the "carrier pillars".

Again, I haven't read it and this is just my option :)

Wish you a nice day ^_^

→ Reply

Apptica

4 months ago, # ^ | ☆ +5

This one is nice for Z function .
https://www.codechef.com/problems/CHSTR

→ Reply

4 months ago, # ^ | ☆ 0

Good day to you

-Morass-

Thank you very much for suggestion, anyway sadly I'm not able to edit my blog anymore to add it :'(

Seems I'm getting "504 Gateway Time-out" every time I try so and I'm unable to resolve this problem .. sorry :'(

→ Reply

Apptica

4 months ago, # ^ | ☆ +5

Its ok. Thank you for the wonderful list :)

→ Reply

GreenGrape

4 months ago, # | ☆ +5

840D - Destiny is a nice example of a tricky wavelet tree.

→ Reply

usernameson

4 months ago, # | ☆ +6

842D - Vitya and Strange Lesson is another trie_bit problem it might be a good addition since the trie_bit list is pretty small.

→ Reply

-Morass-

4 months ago, # ^ | ☆ 0

Good day to you **sahil070197** **GreenGrape** **usernameson**,

Thank you for your contriution. Sadly I can't update the blog anymore (due to "504 Gateway Time-out") :'(

If I would miraculously evade it one day, I'll add those problems,

Good Luck & Have Nice Day!

→ Reply

muradoglu

4 months ago, # | ☆ +6

It would be the greatest help i have ever had on CODEFORCES if you added articles for each type of problems. Because after learning the type of algorithm, the problem list you wrote is the best to deepen it. Anyway thanks a lot BRO!!!.

by the way your post is already is the best profit . . .:)

→ Reply

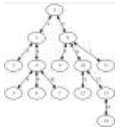
Nickolas

4 months ago, # ^ | ☆ +5

That's what we're trying to do https://e-maxx-eng.appspot.com/

(And many thanks to **-Morass-** for contributing this list of problems to corresponding articles!)

→ Reply



vatsalsharma376

4 months ago, # | ☆ 0

Hello! Why do you have two "Zfunction" tags? Do they serve different purpose?

→ Reply

-Morass-

4 months ago, # ^ | ☆ 0

Good day to you,

nope, seems to be mistake, thank you :)

→ Reply

___tutis___

4 months ago, # | ☆ +5

Add this to geometry: https://icpc.kattis.com/problems/airport Really nice problem :)

→ Reply

bradyawn

4 months ago, # | ☆ +5

Aho-Corasick: http://codeforces.com/problemset/problem/346/B

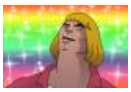
→ Reply

-Morass-

4 months ago, # | ☆ +3

Auto comment: topic has been updated by ***-Morass-*** *(previous revision, new revision, compare).*

→ Reply



bradyawn

4 months ago, # ^ | ☆ 0

Congrats, I see you managed to get around 504-Gateway Time-out.

→ Reply

-Morass-

4 months ago, # ^ | ☆ 0

Thanx ... I was trying for more than week and now it magicaly worked .. I was really surprised :)

→ Reply

Ilnur_the_best

4 months ago, # | ☆ +5

Thank you very much, very interesting:))

→ Reply

kocko

4 months ago, # | ☆ +5

Nice list! Thanks

I also use the Categories section on **ahmed_aly**'s A2 online judge.

→ Reply

XMORE

new, 2 months ago, # ^ | ☆ 0

it is not very specific

→ Reply

-Morass-

new, 2 months ago, # | ☆ 0

*Auto comment: topic has been updated by **-Morass-** (previous revision, new revision, compare).*

→ Reply

michelledilbert1

new, 2 months ago, # | ☆ ← Rev. 2 0

Hello sir, I am doing CP for over a year now(though not on CF) and have learnt basic algorithms(those taught in 6.006 class MIT). What according to you should I do to improve my skills?

EDIT:I forgot to mention that nowadays I am giving contests and reading blogs of people on CF and topcoder but I cannot get 100% of what author is trying to say(in editorial or blog):(

Is there anything I can do or should not do at this point of time?

Thank you.

→ Reply

-Morass-

new, 2 months ago, # ^ | ☆ +2

Good day to you,

Firstly, this is HARD KIND of question, since it is not directly on CP but slightly on "psychology"/"learning" which might be different for different people (so question is whether programmers are the right people to answer this question). Also, as you can see, my progress is not that good so maybe it would be better to ask some red-coder (or nutela).

Here is the text I typically use for such kind of question so hope you'll find something in it:

In first place, one need obtain knowledge in basic algorithms: There are many algorithms which are not hard, yet it is hard to do even medium (sometime easy) problems without them. Starting from dfs/bfs/sieve/graph-algos/sorting/....(many many other). So find some way to learn them. Usually, find some good blod (codeforces/geeksforgeeks/some school's lectures/so on..).

While doing the above, one has to catch some coding/debugging concepts. Afterward it is imho good to do many easy (at most medium) problems to improve coding skills. Even though many people undeestimate this, it is very important to get to phase where you can code what you know (well, it might sound stupid, but many times one know a solution one hour before end of contest, yet he ends coding 10 minutes before end when he starts his 20 minute debugging phase

[and both could be significantly reduced])

As one improves (hopefully), he must start doing harder and harder problems and soon with the harder problems, he must lear also advanced algorithms: Suffix Array/HLD/Segment Trees/...(and many many others) which are usually not "that" necessary for easier problems.

Also during all phases, it is good (even thougt one spends a lot of time by coding) spend some time by reading:

a) New algorithms helpful things b) Editorials for what one doesn't know (firstly THINK about the problems and if nothing come, search for solution. Sometime one just find he's "stupid" but many times one discovers "new amazing" techniques)

Also sometimes it is interesting to peek to solution of others... even (or maybe BEST) after you solve the problem. Sometimes there is much better solution then you came with, sometimes there is something awesome (like algorithmic/or/language trick) which might simplify your futher coding.

Also sometimes it is good to "measure twice, cut once"... thinking for a while even if you know the solution. Sometime you find improvement, or reduce it by redundant part..

anyway... solve solve solve ~ that it what I usually do :)

Good Luck & Wish you a Nice Day!

→ Reply

michelledilbert1

new, 2 months ago, # ^ | ☆ 0

Thank you for guidance!

→ Reply

sabertooth

new, 7 weeks ago, # | ☆ +6

Just the thing I want in my semester break vacation!

Thanks A Lot!

→ Reply

soohotiam

new, 7 weeks ago, # | ☆ +5

Recently I was learn **Link Cut Tree**. Have any list of problems set of link cut tree? Help Me to find out.

→ Reply

-Morass-

new, 7 weeks ago, # ^ | ☆ 0

Good day to you,

only a few — unroll "lct".

→ Reply

soohotiam

new, 7 weeks ago, # ^ | ☆ 0

Thank You! :)

→ Reply

Unsocial_A

new, 6 weeks ago, # | ☆ +5

is problem set arranged in order of ascending difficulty?

→ Reply

new, 6 weeks ago, # ^ | ☆ 0

Good day to you


-Morass-

nope it is not. Some problems mighthave number next_to them, which is estimated difficulty, but it is just "a very wild guess" :).

Wish you a nice day!

→ Reply


unofficial10

new, 6 weeks ago, # | ☆ 0

Strongly Connected Components(SCC)
http://codeforces.com/problemset/problem/427/C

→ Reply


-Morass-

new, 6 weeks ago, # ^ | ☆ 0

Good day to you!

Thank you very much. I've (hopefully) updated the topic!

Wish you a nice day!

→ Reply


Fullmetal_Algorithmist

new, 4 weeks ago, # | ☆ 0

In your MO part there is a problem(https://toph.ws/p/distinct-dishting). The link has changed. It's now https://toph.co/p/distinct-dishting. If you have listed any other problem from that site I think the link should be updated.

→ Reply


Unsocial_A

new, 4 weeks ago, # | ☆ 0

maybe you forget to include digit dp problem...you can use this.

→ Reply


Fullmetal_Algorithmist

new, 4 weeks ago, # | ☆ 0

Did you simply miss HLD or it's there but I can't find it?

→ Reply


-Morass-

new, 4 weeks ago, # ^ | ☆ 0

Good day to you,

HLD is there as part of "LCA"

→ Reply


SinByCos

new, 8 days ago, # | ☆ ← Rev. 3 0

Can someone explain what is the solution for this problem?
http://www.spoj.com/problems/AMR10J/

I am thinking a dp on tree solution, something like O(N*K^2) but that would be too slow. No clue how the problem tag you mentioned, of DAG, would help. Isn't the graph in the form of a forest, with each tree having only one cycle?

Hints would probably be more appreciated though, seems like an interesting problem. :)

EDIT:

Help no longer needed! Managed to solve it in just O(N) and N is only <= 100. Pretty neat. In case anyone is interested, here is the code:
https://pastebin.com/GrvCjSwt

→ Reply

new, 14 hours ago, # | ☆ +5

Is there a CHT list?

→ Reply

Vicennial

new, 11 hours ago, # ^ | ☆ +5

-Morass-

Good day to you,

sorry but not :'(Maybe there is something in Number Theory but I wouln't bet on many problems

Wish you a nice day!

→ Reply