

# TUPC/PUPC 線上題庫

2024/01/18

TUPC/PUPC 歷屆試題

2016

[https://csie.asia.edu.tw/uploads/archive\\_file\\_multiple/file/621db5f6063ca2e3cd15de1a/ncTu\\_2016.pdf](https://csie.asia.edu.tw/uploads/archive_file_multiple/file/621db5f6063ca2e3cd15de1a/ncTu_2016.pdf)

2017

[https://csie.asia.edu.tw/uploads/archive\\_file\\_multiple/file/621db5f6063ca2e3cd15de19/ncTu\\_2017.pdf](https://csie.asia.edu.tw/uploads/archive_file_multiple/file/621db5f6063ca2e3cd15de19/ncTu_2017.pdf)

2018

[https://csie.asia.edu.tw/uploads/archive\\_file\\_multiple/file/621db5f6063ca2e3cd15de18/ncTu\\_2018.pdf](https://csie.asia.edu.tw/uploads/archive_file_multiple/file/621db5f6063ca2e3cd15de18/ncTu_2018.pdf)

2019

[https://csie.asia.edu.tw/uploads/archive\\_file\\_multiple/file/621db5f6063ca2e3cd15de1d/ncTu\\_2019.pdf](https://csie.asia.edu.tw/uploads/archive_file_multiple/file/621db5f6063ca2e3cd15de1d/ncTu_2019.pdf)

2020

[https://csie.asia.edu.tw/uploads/archive\\_file\\_multiple/file/621db5f6063ca2e3cd15de1c/ncTu\\_2020.pdf](https://csie.asia.edu.tw/uploads/archive_file_multiple/file/621db5f6063ca2e3cd15de1c/ncTu_2020.pdf)

2021

[https://csie.asia.edu.tw/uploads/archive\\_file\\_multiple/file/621db5f6063ca2e3cd15de1b/ncPu\\_2021.pdf](https://csie.asia.edu.tw/uploads/archive_file_multiple/file/621db5f6063ca2e3cd15de1b/ncPu_2021.pdf)

2022

[https://csie.asia.edu.tw/uploads/archive\\_file\\_multiple/file/62c4ed99063ca258a4fb4d91/PUPC2022%E7%AB%B6%E8%B3%BD%E9%A1%8C%E7%9B%AE.pdf](https://csie.asia.edu.tw/uploads/archive_file_multiple/file/62c4ed99063ca258a4fb4d91/PUPC2022%E7%AB%B6%E8%B3%BD%E9%A1%8C%E7%9B%AE.pdf)

2023 (詳解 by 謝育平老師)

<https://www.youtube.com/watch?v=yR2qCzy17kA>

# ICPC/NCPC 線上題庫

請至 ITSA 教育部智慧創新跨域人才培育聯盟計畫聯合登入平臺  
(<https://portal.itsa.org.tw/index>) 註冊帳號並登入，成功登入後會看到以下入口畫面



ITSA 教育部智慧創新跨域人才培育聯盟計畫  
聯合登入平臺

Lin Chuang-Chieh ▼



選擇程式自學平台 → 線上題庫，便可看到各樣題庫



針對 ICPC 題庫，可點選 "各競賽試題" 進入，即可看見 "ICPC 臺灣區 題目專區"，勾選 "同意加入題庫成員"

# ICPC 臺灣區 題目專區


[返回上一頁](#)

2023年
2022年
2021年
2020年
2019年
2017年
2016年
2015年
2014年
2013年
2009年

使用者

 題庫參與者

 活動

 程式練習

 討論區





 系統管理

 成績

 簡介

## 主題大綱

 公佈欄

-  [Problem PA] Counterfeit Money 
-  [Problem PB] Recurring Decimal to Fractions 
-  [Problem PC] Where the Lantern Lights are Dimming 
-  [Problem PD] Quarantine Policy 
-  [Problem PE] Slabstones Rearrangement 
-  [Problem PF] Baker's Dilemma 
-  [Problem PG] A Packing Problem 
-  [Problem PH] Bank Deposit Challenge 
-  [Problem PI] The Pentagon Conjecture 
-  [Problem PJ] Lead Time Estimation 

## 其他題庫與資源

CSES Problem Set (<https://cses.fi/problemset/>; 感謝張碩齊同學提供)

Problem Set (<https://cses.fi/problemset/>)

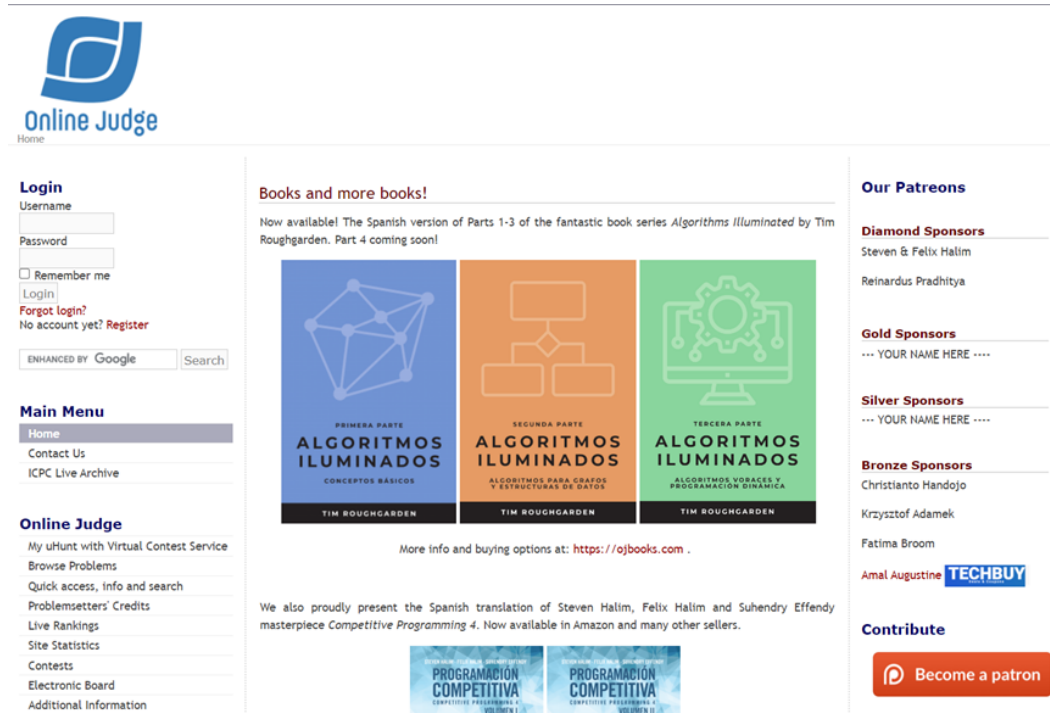
AP325—從 APCS 實作題檢測三級到五級 ([https://jmj.cmgsh.tp.edu.tw/files/AP325\\_v1.3.pdf](https://jmj.cmgsh.tp.edu.tw/files/AP325_v1.3.pdf);  
by 吳邦一教授)

競賽導論及常用函式 (<https://hackmd.io/@MingdaoCP/ryG67cnQK?print-pdf#/>)

UVa Online Judge (請見次頁說明; 感謝陳洧鑫同學協助)

# UVa Online Judge 使用說明

1. UVa Online Judge 網址: <https://onlinejudge.org/>
2. 介面如下:已有帳號者則直接登入，未有帳號則點選“Register”進行註冊。




3. 接下來填寫相關資訊，Result email 勾選:如有排名更動會 email 通知，若不勾選則不會有排名通知。Virtual Judge 可勾選或不勾選。

## Registration

Name:	<input type="text"/>	!
Email:	<input type="text"/>	!
Username:	<input type="text"/>	!
Password:	<input type="password"/>	!
Verify Password:	<input type="password"/>	!
Former Uva ID:	<input type="text"/>	!
Results email:	<input type="checkbox"/>	!
Virtual Judge:	<input type="checkbox"/>	!

4. 接著點選 Browse problem 即可瀏覽題目，並選擇題目閱覽及點選 submit 作答。



Online Judge  
Home

**Login**

Username

Password

☐ Remember me

Login

Forgot login?  
No account yet? Register

ENHANCED BY Google  Search

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**Online Judge**

My uHunt with Virtual Contest Service

Browse Problems

Quick access, info and search

Problemsetters' Credits

Live Rankings

Site Statistics




Contests

Electronic Board

Additional Information



**Books and more books!**

Now available! The Spanish version of Parts 1-3 of the fantastic book series *Algorithms Illuminated* by Tim Roughgarden. Part 4 coming soon!



More info and buying options at: <https://ojbooks.com>.

We also proudly present the Spanish translation of Steven Halim, Felix Halim and Suhendry Effendy masterpiece *Competitive Programming 4*. Now available in Amazon and many other sellers.



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Christianto Handojo


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Fatima Broom

Amal Augustine **TECHBUY**

**Contribute**





Online Judge  
Home > Browse Problems

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**Browse Problems**

Root :: Problem Set Volumes (100...1999) :: Volume 1 (100-199)

Title	Total Submissions / Solving %	Total Users / Solving %
100 - The 3n + 1 problem	918905 / 100%	141788 / 100%
101 - The Blocks Problem	123199 / 100%	24852 / 100%
102 - Ecological Bin Packing	109972 / 100%	32144 / 100%
103 - Stacking Boxes	45913 / 100%	12263 / 100%
104 - Arbitrage	32583 / 100%	7113 / 100%
105 - The Skyline Problem	64359 / 100%	15500 / 100%
106 - Fermat vs. Pythagoras	29815 / 100%	7046 / 100%
107 - The Cat in the Hat	53128 / 100%	9179 / 100%
108 - Maximum Sum	73075 / 100%	23745 / 100%
109 - SCUD Busters	14119 / 100%	3738 / 100%
110 - Meta-Loopless Sorts	13014 / 100%	3583 / 100%
111 - History Grading	35690 / 100%	13526 / 100%
112 - Tree Summing	39420 / 100%	8113 / 100%
113 - Power of Cryptography	77538 / 100%	24687 / 100%
114 - Simulation Wizardry	8960 / 100%	2603 / 100%
115 - Climbing Trees	7648 / 100%	2299 / 100%
116 - Unidirectional TSP	69848 / 100%	12641 / 100%
117 - The Postal Worker Rings Once	10026 / 100%	3960 / 100%
118 - Mutant Flatworld Explorers	28112 / 100%	9999 / 100%
119 - Greedy Gift Givers	44677 / 100%	13137 / 100%

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**100 - The 3n + 1 problem**

Time limit: 3.000 seconds

**Object not found!**

要求された URL は本サーバでは見つかりませんでした。参照ページのリンクが間違っているか、古くなっている可能性があります。ページの著者にこのエラーをお知らせ下さい。

サーバーの障害と思われる場合は、[ウェブ管理者](#)までご連絡ください。

**Error 404**

[onlinejudge.org](https://onlinejudge.org)  
Thu Jan 18 03:51:58 2024  
Apache/2.2.31 (Unix) DAV/2

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The screenshot shows the Online Judge website interface. On the left is a 'Main Menu' with links like Home, My Account, Contact Us, ICPC Live Archive, Logout, and Online Judge options. The central 'My Submissions' table lists various problems and their submission statuses. The right sidebar features 'Our Patreons' with Diamond, Gold, Silver, and Bronze sponsors, and a 'Contribute' button to become a patron.

#	Problem	Verdict	Language	Run Time	Submission Date
29136911	100 The 3n + 1 problem	Wrong answer	C++11	0.470	2024-01-18 02:56:23
29136908	100 The 3n + 1 problem	Compilation error	ANSI C	0.000	2024-01-18 02:53:49
22487326	11541 Decoding	Time limit exceeded	C++	1.000	2018-12-23 15:58:18
22487318	11541 Decoding	Compilation error	C++	0.000	2018-12-23 15:57:01
22487316	11541 Decoding	Compilation error	C++	0.000	2018-12-23 15:56:25
22487305	11541 Decoding	Accepted	C++	0.000	2018-12-23 15:53:47
22487299	11541 Decoding	Compilation error	C++	0.000	2018-12-23 15:51:43
22487296	11541 Decoding	Compilation error	C++	0.000	2018-12-23 15:50:37
22487291	11541 Decoding	Compilation error	C++	0.000	2018-12-23 15:49:18
22487289	11541 Decoding	Compilation error	C++	0.000	2018-12-23 15:47:54
22487217	488 Triangle Wave	Accepted	C++	0.310	2018-12-23 15:31:40
22487122	100 The 3n + 1 problem	Accepted	C++	0.390	2018-12-23 15:11:17
22487046	488 Triangle Wave	Presentation error	C++	0.320	2018-12-23 14:50:00
22486694	10071 Back to High School Physics	Accepted	C++	0.000	2018-12-23 13:31:09

5. 部分題目有中文翻譯可參考: <http://web.kshs.kh.edu.tw/academy/luckycat/index.htm>

6. 以下提供部分題目類型分類及難度:

#### New Comer

- ★ 100 The 3n+1 problem
- ★ 10189 Minesweeper
- ★ 10137 The Trip
- ★ 706 LCD Display
- ★ 10267 Graphical Editor
- ★★ 10033 Interpreter
- ★ 10196 Check The Check
- ★ 10142 Australian Voting

#### Data Structure

- ★ 10038 Jolly Jumpers
- ★★ 10315 Poker Hands
- ★★ 10050 Hartals
- ★★ 843 Crypt Kicker
- ★ 10205 Stack 'em Up
- ★★ 10044 Erdos Numbers
- ★ 10258 Contest Scoreboard
- ★★★★ 10149 Yahtzee

## String

- ★ 10082 WERTYU
- ★★ 10010 Where's Waldorf?
- ★ 10252 Common Permutation
- ★★ 850 Crypt Kicker II
- ★ 10188 Automated Judge Script
- ★★ 10132 File Fragmentation
- ★★★★ 10150 Doublets
- ★★ 848 Fmt

## Sorting

- ★ 10041 Vito's Family
- ★★ 120 Stacks of Flapjacks
- ★★★★ 10037 Bridge
- ★ 10191 Longest Nap
- ★★ 10026 Shoemaker's Problem
- ★★ 10138 CDVII
- ★★ 10152 ShellSort
- ★ 10194 Football (aka Soccer)

## Arithmetic and Algebra

- ★ 10035 Primary Arithmetic
- ★ 10018 Reverse and Add
- ★ 701 The Archeologists' Dilemma
- ★★ 10127 Ones
- ★★★★ 847 A Multiplication Game
- ★ 10105 Polynomial Coefficients
- ★ 10077 The Stern-Brocot Number System
- ★★★★ 10202 Pairsumonious Numbers

## Combinations

- ★ 10183 How Many Fibs?
- ★★ 10213 How Many Pieces of Land ?
- ★★ 10198 Counting
- ★★ 10157 Expressions
- ★★ 10247 Complete Tree Labeling
- ★★ 10254 The Priest Mathematician
- ★★ 10049 Self-describing Sequence
- ★★ 846 Steps



## Number Theory

- ★ 10110 Light, More Light
- ★★ 10006 Carmichael Numbers
- ★ 10104 Euclid Problem
- ★★ 10139 Factovisors
- ★★ 10168 Summation of Four Primes
- ★ 10042 Smith Numbers
- ★ 10090 Marbles
- ★★ 10089 Repackaging

其他 (僅列出分類、題號與題目)

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### Flood Fill

---

352 - The Seasonal War  
469 - Wetlands of Florida  
572 - Oil Deposits  
657 - The die is cast  
705 - Slash Mazes  
776 - Monkeys in a Regular Forest  
782 - Contour Painting  
784 - Maze Exploration  
785 - Grid Colouring  
830 - Shark  
852 - Deciding victory in Go  
10279 - Mine Sweeper  
10336 - Rank the Languages  
10592 - Freedom Fighter  
10946 - You want what filled?

---

### Max Flow / Max Bipartite Matching:

---

259 - Software Allocation  
563 - Crimewave  
663 - Sorting Slides  
670 - The Dog Task  
753 - a plug for unix  
820 - Internet Bandwidth  
10080 - Gopher II  
10092 - The Problem with the Problem Setter  
10122 - Mysterious Mountain  
10249 - the grand dinner (Max Flow too slow for TLE)  
10330 - Power Transmission

10380 - Shogi Tournament  
10511 - Councilling  
10746 - Crime Wave - The Sequel  
10779 - Collectors Problem  
10804 - Gopher Strategy

-----  
Games:  
-----

847 - Multiplication Game  
10368 - Euclids Game  
10404 - Bachet's Game  
10578 - The Game of 31

-----  
Dynamic Programming:  
-----

108 - Maximum Sum  
111 - History Grading  
116 - Unidirectional TSP  
147 - Dollars  
164 - String Computer  
231 - Testing the CATCHER  
348 - Optimal Array Multiplication Sequence  
357 - Let Me Count The Ways  
442 - Matrix Chain Multiplication  
481 - What Goes Up  
497 - Strategic Defense Initiative  
507 - Jill Rides Again  
526 - String Distance and Edit Process  
531 - Compromise  
562 - Dividing Coins  
674 - Coin Change  
711 - Dividing Up  
836 - Largest Submatrix  
10003 - Cutting Sticks  
10032 - Tug Of War  
10051 - Tower of Cubes  
10066 - The Twin Towers  
10069 - Unidirectional TSP  
10081 - Tight Words  
10100 - Longest Match  
10130 - SuperSale  
10131 - Is Bigger Smarter?  
10154 - Weights and Measures  
10192 - Vacation  
10201 - Advantures in Moving Part IV  
10259 - Hippiity Hopscotch

10261 - Ferry Loading  
10280 - Old Wine into New Bottles  
10304 - Optimal Binary Search Tree  
10379 - Pit Stop Strategy  
10400 - Game Show Math  
10405 - Longest Common Subsequence  
10465 - Homer Simpson  
10482 - The Candyman Can  
10529 - Dumb Bones  
10549 - Russian Dolls  
10558 - A Brief Gerrymander  
10559 - Blocks  
10593 - Kites  
10599 - Robots (II)  
10604 - Chemical Reaction  
10617 - Again Palindrome  
10635 - Prince and Princess  
10645 - Menu  
10664 - Luggage  
10690 - Expression Again  
10721 - Bar Codes  
10723 - Cyborg Genes  
10739 - String to Palindrome  
10755 - Garbage Heap  
10759 - Dice Throwing  
10817 - Headmaster's Headache  
10819 - Trouble of 13-Dots  
10827 - Maximum Sum on a Torus  
10860 - Many a Little Makes a Mickel  
10874 - Segments  
10898 - Combo Deal  
10912 - Simple Minded Hashing  
10913 - Walking on a Grid

-----  
Graphs:  
-----

117 - The Postal Worker Rings Once  
125 - Numbering Paths  
280 - vertex  
709 - Formatting Text (the shortest path)  
793 - Network Connections  
10239 - The Book-shelver's Problem (the shortest path)  
10265 - Toroidal Chess Queens' Problem (tree rounds ???)  
10266 - Surveying (connected components)  
10054 - euler problem  
10178 - count the faces  
10608 - Friends  
10731 - Test

---

Connectivity:

---

459 - Graph Connectivity  
10147 - Highways  
10397 - Connect the Campus

---

Big Integer:

---

324 - Factorial Frequencies  
424 - Integer Inquiry  
495 - Fibonacci Freeze  
623 - 500!  
713 - Adding Reversed Numbers  
10013 - Super long sums  
10018 - Reverse and Add  
10035 - Primary Arithmetic  
10106 - Product  
10220 - I Love Big Numbers !  
10515 - Powers Et Al.

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Counting:

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357 - Let Me Count The Ways  
369 - Combinations  
10219 - Find the ways !  
10338 - Mischievous Children

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Josephus:

---

151 - Power Crisis  
440 - Eeny Meeny Moo

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Math:

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106 - Fermat vs. Pythagoras  
113 - Power of Cryptography  
579 - ClockHands  
834 - Continued Fractions  
847 - A Multiplication Game

10071 - Back to High School Physics  
10079 - Pizza Cutting  
10161 - Ant on a Chessboard  
10302 - Summation of Polynomials  
10408 - Farey sequences

-----  
Matrix:  
-----

108 - Maximum Sum  
348 - Optimal Array Multiplication Sequence  
541 - Error Correction  
836 - Largest Submatrix  
10189 - Minesweeper

-----  
Number Conversion:  
-----

344 - Identifying Concurrent Events  
446 - Kibbles `n" Bits `n" Bits `n" Bits  
575 - Skew Binary  
10469 - To Carry or not to Carry

-----  
Number Theory:  
-----

136 - Ugly Numbers  
138 - Street Numbers  
160 - Factors and Factorials  
256 - Quirky Squares  
294 - Divisors  
350 - Pseudo-Random Numbers  
382 - Perfection  
406 - Prime Cuts  
408 - Uniform Generator  
543 - Goldbach's Conjecture  
686 - Goldbach's Conjecture (II)  
10200 - Prime Time

-----  
Simulation:  
-----

10346 - Peter's Smoke  
10409 - Die Game

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## Sorting & Searching:

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299 - Train Swapping  
331 - Mapping the Swaps  
499 - What's The Frequency, Kenneth?  
10008 - What's Cryptanalysis?  
10107 - What is the Median?  
10295 - Hay Points  
10327 - Flip Sort

---

## String:

---

272 - TEX Quotes  
401 - Palindromes  
444 - Encoder and Decoder  
458 - The Decoder  
483 - Word Scramble  
490 - Rotating Sentences  
492 - Pig-Latin  
494 - Kindergarten Counting Game  
576 - Haiku Review  
739 - Lost in Space  
10082 - WERTYU  
10222 - Decode the Mad man  
10260 - Soundex  
10293 - Word Length and Frequency  
10340 - Peter's Smoke  
10361 - Peter's Smoke  
10424 - Love Calculator  
10508 - Word Morphing

---

## Tree:

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536 - Tree Recovery  
10223 - How many nodes ?  
10410 - Tree Reconstruction

---

## Variable Range:

---

10055 - Hashmat the Brave Warrior

---

## Greedy:

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10020 - Minimal Coverage  
10382 - Watering Grass  
10440 - Ferry Loading (II)  
10563 - Least Squares  
10665 - Diatribe

---

## Graph Theory:

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### - Topological Sorting:

00200 Rare Order	Find the correct ordering of an alphabet
10305 Ordering Tasks	Provide some ordering of tasks

### - Trees

00112 Tree Summing	Navigate through a LISP encoded binary tree
00115 Climbing Trees	Figure out the relationships between people
00122 Trees on the level	Produce level-order traversals of binary trees
00615 Is It A Tree?	Determine whether or not the graph is a tree
10308 Roads in the North	Find the longest distance (diameter) of a tree.

### - Eulerian Graphs

00117 The Postal Worker...	Minimize a cost tour for a postman (Simplified Chinese Postman problem)
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### - Cycles

00125 Numbering Paths	Count number of paths in a directed graph
00626 Ecosystem	Find/Print all cycles of size 3

### - Polygon Intersection

00137 Polygons	Find the XOR of two polygon areas
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### - Maximum Flow

00563 Crimewave	Solve the escape problem
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### - Minimum Spanning Trees

10307 Killing Aliens in Bor..	Find least cost way to assimilate all
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## Dynamic Programming:

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### - Memotization

00101 The $3n + 1$ Problem	Find the size of the longest sequence
00371 Ackermann Functions	Find the size of the longest sequence
00547 DDF	Output the longest Decimal-Digit Factor

### - Longest Asc/Desc Subsequence

00103 Stacking Boxes	Find the longest desc. subsequence in n-dims.
00111 History Grading	Find marks for a chronologic ordering question

### - Longest Common Subsequence

00531 Compromise	Find the LCS for two texts
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### - 1D Minimize/Maximize

00222 Budget Travel	Minimize the cost of a road trip
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### - 2D Minimize/Maximize

00104 Arbitrage	Find a successful arbitrage sequence
00108 Maximum Sum	Find the sub-rectangle with largest sum
00116 Unidirectional TSP	Find the minimal path through a 2D field
00585 Triangles	Find the largest triangle in a trianglular field
00590 Always on the run	Find the minimum cost for flying city to city
00526 String Distance & Transform...	Find the string distance and path
10285 Longest Run on a Snowboard	Find the longest snowboarding path in a 2D field
10306 E-coins	Find minimum number of 2D coins to get certain sum

### - Change Making

00147 Dollars	Count # of ways to make change
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## Modelling/Simulation:

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### - Object State Modelling

00102 The Blocks Problem	Manipulation of blocks with robot arm
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### - Planar World Modelling

00114 Simulation Wizardry	Simulate a idealized pinball machine
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00118 Mutant Flatworld Explorers	Simulate robots moving on a plane
00407 Gears on a Board	Simulate gears on a plane
00411 Centipede Collisions	Simulate centipedes on a plane
00824 Coast Tracker	Simulate coastal robots on a plane

- Geometric Structure Modelling

00201 Squares	Count the number of squares in a grid
00209 Triangular Vertices	Model triangular coordinates

- Record Keeping / Bookkeeping

00119 Greedy Gift Givers	Keep track of everyone's net gain/loss
00123 Searching Quickly	Keep track of keywords in titles of books
00139 Telephone Tangles	Keep track of telephone bill
00145 Gondwanaland Telecom	Keep track of telephone bill
00405 Message Routing	Keep track of where routing goes
00603 Parking Lot	Keep track of cars in a parking lot
00645 File Mapping	Print out a file directory

- Josephus Rings

00130 Roman Roulette	Find the survivor
00133 The Dole Queue	Find the order of selected people
00144 Student Grants	Find the order of students getting grants
00151 Power Crisis	Find the step such that a certain region survives

- Card Games

00127 "Accordion" Patience	Simulate Accordion Patience (Solitaire)
00131 The Psychic Poker Player	Determine the best Poker hand
00451 Poker Solitaire	Evaluate some Poker hands
00462 Bridge Hand Evaluator	Evaluate some Bridge hands and suggest a move
00635 Clock Solitaire	Count winning Clock solitaire games

- Board Games

00141 The Spot Game	Figure out who wins the Spot game
00633 A Chess Knight	Figure out how many moves for a dynamic knight
00647 Chutes and Ladders	Figure out who wins a game of Chutes and Ladders
10284 Chessboard in FEN	Figure out number of unattacked squares

- Parsing:

00134 Loglan-A logical Language	Check to see if sentences are in the grammar
00171 Car Trialling	Check to see if sentence is valid instruction
00620 Cellular Structure	Identify the type of organism.
00622 Grammar Evaluation	Evaluate/Parse a $[+, *, (,)]$ math expression

- Calendar/Time Modelling

00150 Double Time	Convert between two calendars
00419 Matching Meetings	Find suitable meeting times for department

- Sports Games

00584 Bowling	Calculate a bowling game score
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- Data Type Modelling

00540 Team Queue	Implement a efficient TeamQueue (buddy system)
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- Print/Font Formatting

00403 Postscript	Implement "fonts" with formatting
00416 LED Test	Determine if there is a valid LED countdown
00426 Fifth Bank of Swamp County	Output the bank record sorted in 3 columns
00433 Bank (Not Quite O.C.R)	Check LED version of bank number

- Text Manipulation

00373 Romulan Spelling	Fix some spelling mistakes
00444 Encoder and Decoder	Encode/Decode according to certain rules
00464 Sentence/Phrase Generator	Generate phrases according to grammar rules
00625 Compression	Compress some source code
00628 Passwords	Rule replacement
00641 Do the Untwist	Untwist an encrypted string

- Assembler Modelling

00448 OOPS!	Convert hexcode to assembly code
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Arithmetic:  
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- Fractions

00202 Repeating Decimals	Figure out length of repeat period of fraction
00834 Continued Fractions	Convert fraction to a continued fraction

- Pythagorean Triples

00106 Fermat vs. Pythagoras	Generating/Counting Pythagorean triples
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- Additive/Multiplicative Series

00107 The Cat in the Hat	Calculate the number of cats in the hat
00138 Street Numbers	Find special house numbers
10302 Summation of Polynomials	Find the sum of the first N cubes

- Exponentiation/Logarithms

00113 Power of Cryptography	Find integer roots of large numbers
00545 Heads	Find $2^{-n} = x.xxxE-y$ for large n

- Polynomials

00126 The Errant Physicist	Multiply polynomials of x and y
00586 Instant Complexity	Calculate the complexity of a program

- Long Division/Multiplication

00128 Software CRC	Calculate the CRC value for a string of text(divide)
00550 Multiplication by Rotation	Find shortest factor with rotamult-property
00465 Overflow	Determine whether numbers overflow an int

- Combinatorics:

00135 No Rectangles	Find a suitable block design
00146 ID Codes	Find the next permutation
00153 Permallex	Convert between indices and words sorted in lex. order
00580 Critical Mass	Count number of binary strings with 3 consecutive 1's
00527 The partition of a cake	Count the number of partitions made by cake cutting
10294 Arif in Dhaka	Count the number of necklace/bracelets of size N with T colors
10303 How Many Trees?	Count the number of binary trees (Catalan numbers)

- Primes/Factorization

00136 Ugly Numbers	Find the 1500th ugly number factors(2,3,5)
00583 Prime Factors	List the prime factorization of a number efficiently
10311 Goldbach and Euler	Determine if a number is sum of 2 primes

- Probability

00542 France '98	Figure out the probability that a team will win
10288 Coupons	Figure out probability that you will win

- Number Bases

00619 Numerical Speaking	Convert between words and numeric index
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- Partitioning

00668 Parliament                      Find maximum distinct partition product

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Direct:  
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- Counting:

00102 Ecological Bin Packing	Find minimum number of bottles to move
00154 Recycling	Find station that minimizes items moving
00278 Chess	Count number of non attacking pieces
00413 Up and Down Sequences	Count the number of up and down runs
00613 Numbers that Count	Find out if numbers are self-inventorying
00637 Booklet Printing	Figure out which pages go where in a fold-over booklet
00696 How Many Knights	Find max # of knights to place on $n*m$ board
10293 Word Length and Frequency	Count length and freq of words
10300 Ecological Premium	Count premiums for farmers

- Sorting:

00110 Meta-Loopless Sorts	Produce Pascal programs that do sorting
00120 Stacks of Flapjacks	Sort a stack of flapjacks using flips
00514 Rails	Sort a train using a station
00538 Balancing Bank Accounts	Figure out who owes who what
00612 DNA Sorting	Sort some DNA based on some trait
00632 Compression (II)	Perform a Burrows Wheel Transform

- Recursion

00155 All Squares	Count number of squares surrounding a point
00432 Modern Art	Generate some modern triangular art

- Palindromes

00401 Palindromes	Determine the type of the word
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- String manipulation/comparison

00644 Immediate Decodability	Determine if the code set is immediately decodable
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Geometry:  
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- Z-Buffering

00105 The Skyline Problem	Construct a skyline vector
00142 Mouse Clicks	Determine which windows was clicked

- Convex Hulls

00109 SCUD Busters	Determine regions with power after a war
00132 Bumpy Objects	Find a stable position for shapes

- Circles

00121 Pipe Fitters	Calculate the most pipes that can fit
00149 Forests	Determine viewable trees in an infinite forest
10301 Rings and Glue	Determine number of intersecting circles

- Points in Polygons

00143 Orchard Trees	Determine numbers of points in triangles
00634 Polygon	Determine if a point is in a polygon

- Distance

00152 Tree's a Crowd	Generate a histogram of tree distances
10310 Dog and Gopher	Find out if the golpher can get to hole

- Art Gallery Problem

00588 Video Surveillance	Determine if a camera can see all walls
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- Spheres/Globes

00535 Globetrotter	Find distance between two points on earth
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- Polar/Azimuth Coordinates

00404 Radar Scopes	Figure out warnings for planes using radar
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- Area of polygons

00428 Swamp County Roofs	Calculate area of trapezoidal roof tiles
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- Pure Geometry

10283 The Kissing Circles	Determine areas associated with circles in circles
10286 Trouble with a Pentagon	Find the length of largest square in a pentagon
10287 Gifts in a Hexagon Box	Fit circles inside a regular hexagonal box

- Center of gravity

10291 Cut the Legs	Cut a table so that it balances
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- Line intersection

00834 Water Falls

Figure out where water will land

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Searching:  
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- Constraint Satisfaction

00124 Following Orders

Find all consistent orderings

00129 Krypton Factor

Find special "hard" sequences

- Brute Force Searching (no pruning)

00140 Bandwidth

Check all 8! sequences

00418 Molecules

Find the largest molecule that can be made

00565 Pizza Anyone?

Satisfy all topping requests if possible

00616 Coconuts, Revisited

Find the maximum number of people on island.

00629 Test

Find all "non different" sets

00638 Finding Rectangles

Find all rectangles in alphabetical order

- Search with pruning

00624 CD

Find set of songs which fit best on tape

10309 Turn the Light Off

Find min. # of pushes to turn off lights

- Anagrams

00148 Anagram Checker

Find possible anagram sentences from dictionary

00630 Anagrams(II)

Find possible anagrams for words

00642 Word Amalgamation

Find possible anagrams for words

- Word Searches

00581 Word Search Wonder

Find words in a grid

00409 Excuses, Excuses!

Find key "excuses" in a sentences

00425 Enigmatic Encryption

Find the password from a text

00604 The Boggle Game

Find matching words in 2 Boggle boards

- Greedy Algorithms

00410 Balance Station

Minimize Imbalance for a centrifuge