### Dynamic Programming 1

Welcome to the first contest in the 2013 winter coding camp. To start things off, we'll do a DP set of easy-medium difficulty. There are 5 problems in all ranging from Div 2 medium to Div 1 medium. Remember that scores on Div 2 problems will be halved. If you have any doubts, make sure you re-read the [rules](http://wintercoding.mycodeschool.com/rules). glhf :-)

#### **Problems**

[PillarsDivTwo](http://community.topcoder.com/stat?c=problem_statement&pm=12075) SRM 547 DIV 2, 500

[Stamp](http://community.topcoder.com/stat?c=problem_statement&pm=11835) SRM 558 DIV 2, 600

[MonstersValley](http://community.topcoder.com/stat?c=problem_statement&pm=12350) SRM 565 DIV 1, 250

[AstronomicalRecords](http://community.topcoder.com/stat?c=problem_statement&pm=12804) SRM 594 DIV 1, 250

[BoxesArrangement](http://community.topcoder.com/stat?c=problem_statement&pm=7772) SRM 351 DIV 1, 500

### Dynamic Programming 2

This second contest will continue the theme of simple DPs for the day. You have only 3 problems to solve this time, but they are all of a medium difficulty.

#### **Problems**

[LittleElephantAndXor](http://community.topcoder.com/stat?c=problem_statement&pm=12623) SRM 595 DIV 2, 1000

[CrossingTheRiver](http://community.topcoder.com/stat?c=problem_statement&pm=11896) TCO 2012 Round 3B DIV 1, 300

[Skyscrapers](http://community.topcoder.com/stat?c=problem_statement&pm=8582) SRM 395 DIV 1, 500

**KATA**

[Repetitive practice](https://en.wikipedia.org/wiki/Kata) is very important to fully understand a problem and explore all its possibilities. Use the kata contests to see how you can improve and get faster. Check out [this TopCoder tutorial](http://community.topcoder.com/tc?module=Static&d1=tutorials&d2=planApproach1) on coding kata to get a better idea. Approach this contest just like the others. Clear all problems, re-read the problem statement and give it a fresh shot.

### Greedy 1

After the tough second contest yesterday, we'll explore the world of greedy solutions today. Greedy problems typically require good intuition, solid proof technique and (usually) very few lines of code. Try to prove these on paper before you type them in to save time and minimize bugs.

#### **Problems**

[PenguinPals](http://community.topcoder.com/stat?c=problem_statement&pm=12355) SRM 566 DIV 2, 500

[SkewedPerspectives](http://community.topcoder.com/stat?c=problem_statement&pm=11404) SRM 538 DIV 2, 1050

[TeamContest](http://community.topcoder.com/stat?c=problem_statement&pm=12470) SRM 573 DIV 1, 250

[FoxAndFencing](http://community.topcoder.com/stat?c=problem_statement&pm=12864) SRM 598 DIV 1, 500

### Greedy 2

Continuing on the theme of greedy algorithms, we'll do another set of 5 greedy problems in 2 hours.

#### **Problems**

[BinPackingEasy](http://community.topcoder.com/stat?c=problem_statement&pm=12862) SRM 598 DIV 2, 500

[FoxAndFencingEasy](http://community.topcoder.com/stat?c=problem_statement&pm=12414) SRM 598 DIV 2, 1000

[NewArenaPassword](http://community.topcoder.com/stat?c=problem_statement&pm=12386) SRM 572 DIV 1, 250

[TheJediTest](http://community.topcoder.com/stat?c=problem_statement&pm=12265) SRM 569 DIV 1, 500

[FlipGame](http://community.topcoder.com/stat?c=problem_statement&pm=11974) SRM 544 DIV 1, 500

### Dynamic Programming 3

In this contest, you'll encounter simple forms of some very common kind of DP problems. You'll also be able to re-use the patterns you saw in the previous DP contests to help you along!

#### **Problems**

[ForbiddenStrings](http://community.topcoder.com/stat?c=problem_statement&pm=8480) SRM 412 DIV 1, 250

[EventOrder](http://community.topcoder.com/stat?c=problem_statement&pm=11515) TCO11 Wildcard Round DIV 1, 250

[ContestSchedule](http://community.topcoder.com/stat?c=problem_statement&pm=6708) SRM 320 DIV 2, 1000

[NumbersAndMatches](http://community.topcoder.com/stat?c=problem_statement&pm=10709) SRM 454 DIV 2, 1000

[SumThemAll](http://community.topcoder.com/stat?c=problem_statement&pm=6430) SRM 311 DIV 1, 600

### Dynamic Programming 4

Only Div 1 500s in this contest!

#### **Problems**

[RedIsGood](http://community.topcoder.com/stat?c=problem_statement&pm=9915) SRM 420 DIV 1, 500

[Chomp](http://community.topcoder.com/stat?c=problem_statement&pm=6851) TCO08 Round 1 DIV 1, 500

[PrefixFreeSubsets](http://community.topcoder.com/stat?c=problem_statement&pm=7255) SRM 330 DIV 1, 500

### Graph Algorithms 1

We'll step into the vast world of graph algorithms by attempting a relatively easy set of 4 problems in this 90-minute contest.

#### **Problems**

[HexagonalBoard](http://community.topcoder.com/stat?c=problem_statement&pm=12784) SRM 593 DIV 1, 250

[TheTree](http://community.topcoder.com/stat?c=problem_statement&pm=12746) SRM 591 DIV 1, 275

[ThreeColorabilityEasy](http://community.topcoder.com/stat?c=problem_statement&pm=12699) SRM 587 DIV 2, 1000

[TreeUnionDiv2](http://community.topcoder.com/stat?c=problem_statement&pm=12587) SRM 581 DIV 2, 1000

### Graph Algorithms 2

Time to find the shortest path through another 4 graph problems. For those who want more, try the Codeforces contest that starts at 1930.

#### **Problems**

[GooseTattarrattatDiv1](http://community.topcoder.com/stat?c=problem_statement&pm=12730) SRM 589 DIV 1, 250

[Egalitarianism](http://community.topcoder.com/stat?c=problem_statement&pm=12613) SRM 584 DIV 1, 250

[GameOnABoard](http://community.topcoder.com/stat?c=problem_statement&pm=12556) SRM 583 DIV 2, 900

[SkiResort](http://community.topcoder.com/stat?c=problem_statement&pm=12468) SRM 573 DIV 1, 450

### Mixed Bag 1

This mock is special in that it has a large number of problems. Those who are in the campus will be attempting it as teams. Those who are online can approach it normally. Individual leaderboards will be brought out as usual and tomorrow's kata contest will have all 8 of these problems.

#### **Problems**

[TrafficCongestion](http://community.topcoder.com/stat?c=problem_statement&pm=11361) SRM 585 DIV 1, 250

[TravelOnMars](http://community.topcoder.com/stat?c=problem_statement&pm=12608) SRM 583 DIV 1, 250

[GooseInZooDivOne](http://community.topcoder.com/stat?c=problem_statement&pm=12539) SRM 578 DIV 1, 250

[FoxAndHandle](http://community.topcoder.com/stat?c=problem_statement&pm=12331) SRM 563 DIV 1, 300

[RoundOfEleven](http://community.topcoder.com/stat?c=problem_statement&pm=8005) SRM 372 DIV 1, 500

[TurnOnLamps](http://community.topcoder.com/stat?c=problem_statement&pm=12606) SRM 583 DIV 1, 500

[WolfInZooDivTwo](http://community.topcoder.com/stat?c=problem_statement&pm=12533) SRM 578 DIV 2, 1000

[FoxAndTouristFamilies](http://community.topcoder.com/stat?c=problem_statement&pm=11811) SRM 561 DIV 2, 1000

### Graph Algorithms 3

After the Christmas break, we're back to our normal contests with another set of graph problems.

#### **Problems**

[ArcadeManao](http://community.topcoder.com/stat?c=problem_statement&pm=12504) SRM 576 DIV 2, 576

[XorTravelingSalesman](http://community.topcoder.com/stat?c=problem_statement&pm=12175) SRM 556 DIV 2, 500

[CentaurCompany](http://community.topcoder.com/stat?c=problem_statement&pm=12428) SRM 570 DIV 1, 500

[CentaurCompanyDiv2](http://community.topcoder.com/stat?c=problem_statement&pm=12426) SRM 570 DIV 2, 1000

### Graph Algorithms 4

A tough graph contest - only div 2 level 3 and div 1 level 2 problems!

#### **Problems**

[CactusCount](http://community.topcoder.com/stat?c=problem_statement&pm=10077) SRM 419 DIV 2, 1000

[PlanarGraphShop](http://community.topcoder.com/stat?c=problem_statement&pm=10412) SRM 453.5 DIV 1, 500

[KingdomReorganization](http://community.topcoder.com/stat?c=problem_statement&pm=11282) SRM 531 DIV 2, 1000

[HamiltonPath](http://community.topcoder.com/stat?c=problem_statement&pm=10572) SRM 452 DIV 2, 1000

### Maximum Flow / Bipartite matching 1

Time to put into practice what we saw in the previous talk session!

#### **Problems**

[PointyWizardHats](http://community.topcoder.com/stat?c=problem_statement&pm=11965) SRM 549 DIV 1, 250

[Incubator](http://community.topcoder.com/stat?c=problem_statement&pm=12080) SRM 557 DIV 1, 500

[PlayingCubes](http://community.topcoder.com/stat?c=problem_statement&pm=4731&rd=8016) TCO05 Round 3, 250

### Maximum Flow / Bipartite Matching 2 and Kata

This is a mixed contest that combines all problems from the previous contest alongside some new practice problems.

#### **Problems**

[PointyWizardHats](http://community.topcoder.com/stat?c=problem_statement&pm=11965) SRM 549 DIV 1, 250

[Incubator](http://community.topcoder.com/stat?c=problem_statement&pm=12080) SRM 557 DIV 1, 500

[PlayingCubes](http://community.topcoder.com/stat?c=problem_statement&pm=4731&rd=8016) TCO05 Round 3, 250

[RookAttack](http://community.topcoder.com/stat?c=problem_statement&pm=1931) 2003 TCO Semifinals 4, 1050

[Parking](http://community.topcoder.com/stat?c=problem_statement&pm=3530) SRM 236 DIV 1, 1000

### Mixed Bag 2

This short contest will feature the guests of the day on their best coding behavior. For those on campus, it's a chance to see how the older generation codes! Those online as well as those on the campus can also take part in this contest normally..

#### **Problems**

[EllysCheckers](http://community.topcoder.com/stat?c=problem_statement&pm=11791) SRM 534 DIV 1, 250

[FiveHundredEleven](http://community.topcoder.com/stat?c=problem_statement&pm=11484) SRM 511 DIV 1, 500

[BigFatInteger2](http://community.topcoder.com/stat?c=problem_statement&pm=12870) SRM 599 DIV 2, 500

### Mixed Bag 3

The final contest features a div 2 250 for the first time! We have 5 problems ranging all the way from div 2 level 1 to div 1 level 3 and covering a range of different algorithms. The contest time is 2 hours 30 minutes to give you more time to attempt all of them :-)

#### **Problems**

[CityMap](http://community.topcoder.com/stat?c=problem_statement&pm=12479) SRM 574 DIV 2, 250

[MaxTriangle](http://community.topcoder.com/stat?c=problem_statement&pm=10548) SRM 449 DIV 1, 250

[SignalIntelligence](http://community.topcoder.com/stat?c=problem_statement&pm=11059) SRM 480 DIV 2, 900

[FiveHundredEleven](http://community.topcoder.com/stat?c=problem_statement&pm=11484) SRM 511 DIV 1, 500

[UndergroundVault](http://community.topcoder.com/stat?c=problem_statement&pm=1939) SRM 171 DIV 1, 1000

### Tree DP Problems

http://www.codechef.com/problems/RESTEXP  
http://www.codechef.com/problems/TREES/  
http://community.topcoder.com/stat?c=problem\_statement&pm=12426  
http://www.spoj.com/problems/AMR10J/

### Some interesting problems

DP:  
  
http://www.spoj.com/problems/IPL1/  
http://www.spoj.com/problems/MAXWOODS/  
http://www.spoj.com/problems/WITTYBOY/  
  
Medium:  
  
http://www.spoj.com/problems/TWOKINGS/  
http://www.spoj.com/problems/GAMARENA/  
http://www.spoj.com/problems/WITTY/  
  
Easy and interesting:  
  
http://www.spoj.com/problems/GAMES/  
http://www.spoj.com/problems/NITHY/  
http://www.spoj.com/problems/FANCY/  
  
  
  
Thanks,  
cegprakash.

### Video resources on memory management and recursion

Here are some videos that should clear your basic understanding of how memory is managed during execution of a program and how recursion happens in memory.   
  
Dynamic memory allocation - concept of stack and heap   
http://www.youtube.com/watch?v=\_8-ht2AKyH4   
  
Why recursion is not always good -   
http://www.youtube.com/watch?v=GM9sA5PtznY   
  
Recursion with memoization (DP) -  
http://www.youtube.com/watch?v=UxICsjrdlJA   
  
You can also check other videos in recursion playlist through YouTube channel page.