O objetivo do trabalho é aplicar grafos na resolução de alguns problemas apresentados no site da ACM de competições de programação. Em primeiro lugar vocês devem se cadastrar no site da acm:

http://uva.onlinejudge.org/

O trabalho consiste em resolver 6 problemas das listas abaixo e conseguir validá-los no site da ACM. Não podem ser escolhidos dois problemas da mesma categoria. O trabalho deve ser desenvolvido em duplas de 2. Para cada exercício resolvido deve ser colocado no webfolio a descrição do exercício (pdf da página da ACM), o código-fonte, uma descrição da solução e um print-screen da tela da ACM comprovando a submissão. Isso deve ser feito até o dia 13/12 ~~29/11~~, data de nossa segunda prova. Peço que assim que vocês forem compondo as duplas me enviem a composição das mesmas e o usuário cadastrado no site da ACM. E peço que, para evitar que duas duplas resolvam os mesmos problemas, à medida que vocês forem escolhendo os problemas me enviem o número do mesmo através do fórum.

Lista 1 – Componentes Conexas

1. UVa 260 - Il Gioco dell'X
2. UVa 352 - Seasonal War (Flood Fill)
3. UVa 459 - Graph Connectivity (also solvable with Union-Find Disjoint Sets)
4. UVa 469 - Wetlands of Florida (Flood Fill)
5. UVa 572 - Oil Deposits (Flood Fill)
6. UVa 657 - The Die is Cast (Flood Fill)
7. UVa 782 - Countour Painting (Flood Fill)
8. UVa 784 - Maze Exploration (Flood Fill)
9. UVa 785 - Grid Colouring (Flood Fill)
10. UVa 852 - Deciding victory in Go (Flood Fill)
11. UVa 10336 - Rank the Languages (Flood Fill)
12. UVa 10926 - How Many Dependencies?
13. UVa 10946 - You want what filled? (Flood Fill)
14. UVa 11110 - Equidivisions (Flood Fill)
15. UVa 11518 - Dominos 2 (Flood Fill)
16. UVa 11749 - Poor Trade Advisor (also solvable with Union-Find Disjoint Sets)

Lista 2 – Articulações/Pontes

1. UVa 315 - Network (Articulation Points)
2. UVa 610 - Street Directions (Bridges)
3. UVa 796 - Critical Links (Bridges)
4. UVa 10199 - Tourist Guide (Articulation Points)

Lista 3 - Componentes fortemente conexas

1. UVa 10731 - Test
2. UVa 11504 - Dominos
3. UVa 11709 - Trust Groups
4. UVa 11770 - Lighting Away

Lista 4 – Ordenação Topológica

1. UVa 124 - Following Orders
2. UVa 200 - Rare Order
3. UVa 872 - Ordering
4. UVa 10305 - Ordering Tasks

Lista 5 - Busca em amplitude / distância entre vértices em grafo não-valorado

1. UVa 336 - A Node Too Far
2. UVa 383 - Shipping Routes
3. UVa 417 - Word Index
4. UVa 429 - Word Transformation
5. UVa 439 - Knight Moves
6. UVa 532 - Dungeon Master (3-D BFS)

7. UVa 567 - Risk
8. UVa 627 - The Net (must print the path)
9. UVa 762 - We Ship Cheap
10. UVa 924 - Spreading the News
11. UVa 928 - Eternal Truths
12. UVa 10009 - All Roads Lead Where?
13. UVa 10044 - Erdos numbers (parsing part is troublesome)
14. UVa 10067 - Playing with Wheels (implicit graph in problem statement)
15. UVa 10102 - The Path in the Colored Field
16. UVa 10150 - Doublets (BFS state is string!)
17. UVa 10422 - Knights in FEN
18. UVa 10610 - Gopher and Hawks
19. UVa 10653 - Bombs! NO they are Mines!! (BFS implementation must be efficient)
20. UVa 10959 - The Party, Part I
21. UVa 11049 - Basic Wall Maze (some restricted moves + print path)
22. UVa 11352 - Crazy King
23. UVa 11513 - 9 Puzzle (BFS from goal state + efficient data structure)
24. UVa 11545 - Avoiding Jungle in the Dark
25. UVa 11730 - Number Transformation (need prime factoring, see Section 5.3.1)
26. UVa 11792 - Krochanska is Here! (be careful with the definition of 'important station')

Lista 6 – Variantes de busca em amplitude

1. UVa 10004 - Bicoloring (Bipartite Graph check)
2. UVa 11080 - Place the Guards (Bipartite Graph check, some tricky cases)
3. UVa 11101 - Mall Mania (Multi-Sources BFS from mall1, get min at border of mall2)
4. UVa 11624 - Fire! (Multi-Sources BFS)

Lista 7 - Aplicações de árvore geradora mínima

1. UVa 908 - Re-connecting Computer Sites (discussed in this section)
2. UVa 10034 - Freckles (straightforward MST problem)
3. UVa 10307 - Killing Aliens in Borg Maze (build SSSP graph with BFS, then MST)
4. UVa 11228 - Transportation System (split output for short versus long edges)
5. UVa 11631 - Dark Roads (weight of all edges in graph - weight of all edges in MST)
6. UVa 11710 - Expensive Subway (output 'Impossible' if graph still unconnected)
7. UVa 11733 - Airports (maintain cost at every update)
8. UVa 11747 - Heavy Cycle Edges (sum the edge weights of the chords)

Lista 8 – Variantes de Árvore geradora mínima

1. UVa 10147 - Highways (Partial 'Minimum' Spanning Tree)
2. UVa 10369 - Arctic Networks (Minimum Spanning 'Forest')
3. UVa 10397 - Connect the Campus (Partial 'Minimum' Spanning Tree)
4. UVa 10600 - ACM Contest and Blackout (Second Best Spanning Tree)
5. UVa 10842 - Traffic Flow (find min weighted edge in 'Maximum' Spanning Tree)

Lista 9 – Aplicações do algoritmo de Dijkstra

1. UVa 341 - Non-Stop Travel (actually solvable with Floyd Warshall's algorithm)
2. UVa 929 - Number Maze (on a 2-D maze graph)
3. UVa 10278 - Fire Station
4. UVa 10603 - Fill
5. UVa 10801 - Lift Hopping (model the graph carefully!)
6. UVa 10986 - Sending email (straightforward Dijkstra's application)
7. UVa 11377 - Airport Setup (model the graph carefully!)
8. UVa 11492 - Babel (model the graph carefully!)
9. UVa 11635 - Hotel Booking (Dijkstra's + BFS)
10. LA 3290 - Invite Your Friends (+ BFS)

Lista 10 – Aplicações do algoritmo de Ford

1. UVa 558 - Wormholes (checking the existence of negative cycle)
2. UVa 10557 - XYZZY
3. UVa 11280 - Flying to Fredericton (modified Bellman Ford's)

Lista 11 – Aplicações do algoritmos de Floyd Warshall

1. UVa 186 - Trip Routing (graph is small)
2. UVa 341 - Non-Stop Travel (graph is small)
3. UVa 423 - MPI Maelstrom (graph is small)
4. UVa 821 - Page Hopping (one of the 'easiest' ICPC World Finals problem)
5. UVa 10075 - Airlines (with special great-circle distances, see Section 7.2)
6. UVa 10171 - Meeting Prof. Miguel (solution is easy with APSP information)
7. UVa 11015 - 05-32 Rendezvous (graph is small)
8. UVa 10246 - Asterix and Obelix
9. UVa 10724 - Road Construction (adding one edge will only change 'few things')
10. UVa 10793 - The Orc Attack (Floyd Warshall's simplifies this problem)
11. UVa 10803 - Thunder Mountain (graph is small)
12. UVa 11463 - Commandos (solution is easy with APSP information)

Lista 12 – Variantes do algoritmo de distância entre vértices

1. UVa 334 - Identifying Concurrent Events (transitive closure is only the sub-problem)
2. UVa 534 - Frogger (Minimax)
3. UVa 544 - Heavy Cargo (Maximin)
4. UVa 869 - Airline Comparison (run Warshall's twice, then compare the AdjMatrices)
5. UVa 925 - No more prerequisites, please!
6. UVa 10048 - Audiophobia (Minimax)
7. UVa 10099 - Tourist Guide (Maximin)

Lista 13 – Exercícios envolvendo árvores

1. UVa 112 - Tree Summing (backtracking)
2. UVa 115 - Climbing Trees (tree traversal, LCA)
3. UVa 122 - Trees on the level (tree traversal)
4. UVa 536 - Tree Recovery (tree traversal, reconstructing tree from pre + inorder)
5. UVa 615 - Is It A Tree? (graph property check)
6. UVa 699 - The Falling Leaves (preorder traversal)
7. UVa 712 - S-Trees (tree traversal)
8. UVa 10308 - Roads in the North (diameter of tree, discussed in this section)
9. UVa 10459 - The Tree Root (diameter + center of tree)
10. UVa 10701 - Pre, in and post (reconstructing tree from pre + inorder)
11. UVa 10938 - Flea Circus (use LCA)
12. UVa 11695 - Flight Planning (diameter + center of tree)

Lista 14 – Caminho mais curto/mais longo em um GAD

1. UVa 103 - Stacking Boxes
2. UVa 10000 - Longest Paths
3. UVa 10166 - Travel (shortest paths)
4. UVa 10029 - Edit Step Ladders
5. UVa 10350 - Liftless Eme (shortest paths)
6. UVa 11324 - The Largest Clique (find SCC first then longest path on DAG)

Lista 15 – Contagem de caminhos em um GAD

1. UVa 825 - Walking on the Safe Side (the graph is DAG, DP)
2. UVa 926 - Walking Around Wisely (the graph is DAG, DP)
3. UVa 988 - Many paths, one destination (topological sort + DP on DAG)

Lista 16 – Associação máxima em grafo bipartido

1. UVa 670 - The Dog Task

2. UVa 753 - A Plug for Unix
3. UVa 10080 - Gopher II
4. UVa 10092 - The Problem with the Problemsetter
5. UVa 10735 - Euler Circuit
6. UVa 11045 - My T-Shirt Suits Me
7. UVa 11418 - Clever Naming Patterns

Lista 17 – Conjunto de arestas independentes de peso máximo em grafo bipartido

1. UVa 11159 - Factors and Multiples (similar solution with Bipartite Matching above)

Lista 18 – Cobertura máxima de vértices em grafo bipartido

1. UVa 11419 - SAM I AM (Min Vertex Cover)