CLUSTER INNOVATION CENTRE, DELHI UNIVERSITY

Discrete Mathematics
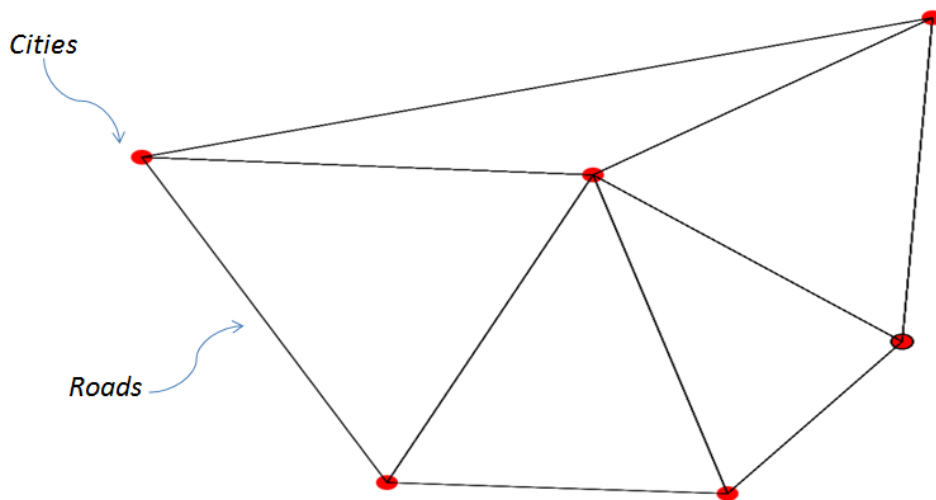# A Browser Based Game

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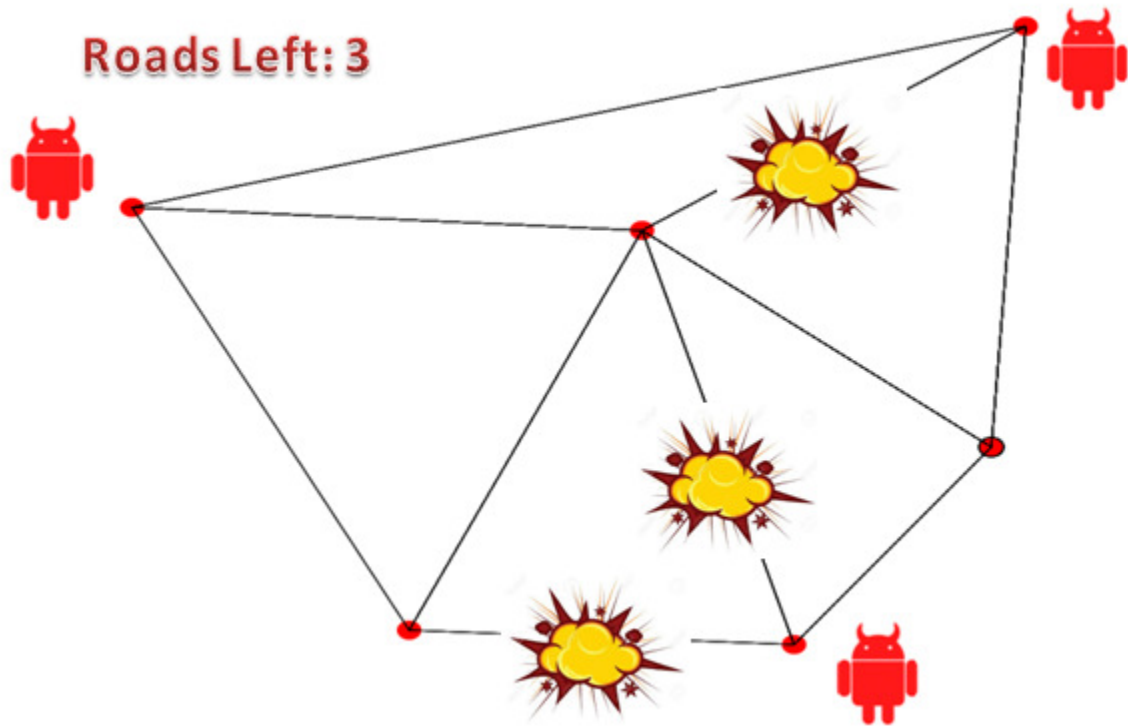
THE GAME

Game is based in a hypothetical world in which there is a vast empire. It is spread across a large number of cities. And you are its playing monarch. All cities are well flourished and for their growth, they are well connected by trade routes.

But one day, giant evil robots attack your kingdom. They start a planned attack in different cities. Now you have to protect your kingdom. For that, you have to prevent robots from meeting by destroying roads. And destroy roads such that there is NO possible path left for any two robots to meet.
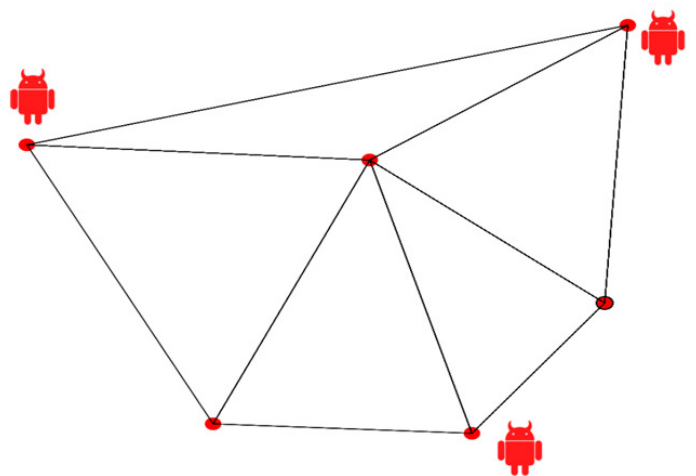
But destroying roads cost money, therefore you have to destroy them wisely in the limited amount of resources you have.

Roads Left: 3

ALGORITHMS USED

- ## DELAUNAY TRIANGUALTION

This algorithm is used to create random graphs. We used it so that user get a different map each time it plays the game. Delaunay triangulation is a triangulation technique which creates planar graphs by creating triangles joining vertices. Delaunay triangulation for a set P of points in a plane is a triangulation such that no point in P is inside the circumcircle of any triangle in triangulation.

- ## MINIMUM WEIGHT FINDING USING DISJOINT SETS

This algorithm is used to find the solution of the graph. It is also used to assign available coins at the start of game. This algorithm solves the problem of finding the edges of minimum weight which are needed to be removed such that no possible path remains between two cities under attack. In this algorithm, we create sets of vertices which are linear and in each set there is at most one robot. Now we join these sets together if there is an edge present joining them but also considering that both sets must contain robots. After that we find edge having minimum weight at delete it.