Spike: Tactical Analysis with PlanetWars

Context:
Tactical analysis techniques can enable game agents to react intelligently, and to plan intelligently, even within challenging dynamic game environments. It is very important that the game environment is able to provide sufficient and suitable information for analysis.

Knowledge/Skill Gap:
The developer needs to be able to use tactical analysis to influence agent decisions in the context of a strategic game model.

Goals/Deliverables: [CODE] + [SPIKE REPORT]

- Create at least two different "bot" agents for the PlanetWars simulation.
- One of your bots must utilise tactical analysis to inform its decisions. Examples:
    - Simple: include attacking "weakest", "strongest", "closest" or most productive planet.
    - Complex: include event detection ("fleet leaving planet vulnerable"), scouting or fog-of-war deception.
- Numerically compare each bots' performance and present the results of the both performances over multiple maps.

Start-End Period: Week 8 – Week 9

Planning Notes:
- There is a simple lab walk-through to create your own first bot. Do that first!
- The PlanetWars simulation code is provided on the unit website.
- See the documents provided regarding the game and how to create new bots.
- It is strongly suggested that one of the bots you create uses a "naïve" approach (doesn't make use of tactical analysis information), while a second does. This will make comparison easier. (Note: The naïve bot might do better – see what the results say.)
- To show that you have "numerically compared" each bots performance, we suggest a table with basic statistics collected from a number of games (not just one match) (eg. bot1 vs bot2).
- You might want to alter the visual presentation of planets (say colour) or draw edges (lines) between planets to represent "tactical" options that currently available.

Extensions:
- Consider what additional "tactical" information could be analysed and exploited.
- The PlanetWars simulation supports a "fog of war" view of the game environment, where each bot agent only has partial (incomplete, possibly incorrect) information about the current state of the game. Explore what the implications of this are, and how they could be exploited.
- Most of the game maps provided are symmetrical. What does an asymmetric map create in terms of game bias (game balance) as well as tactical opportunity?