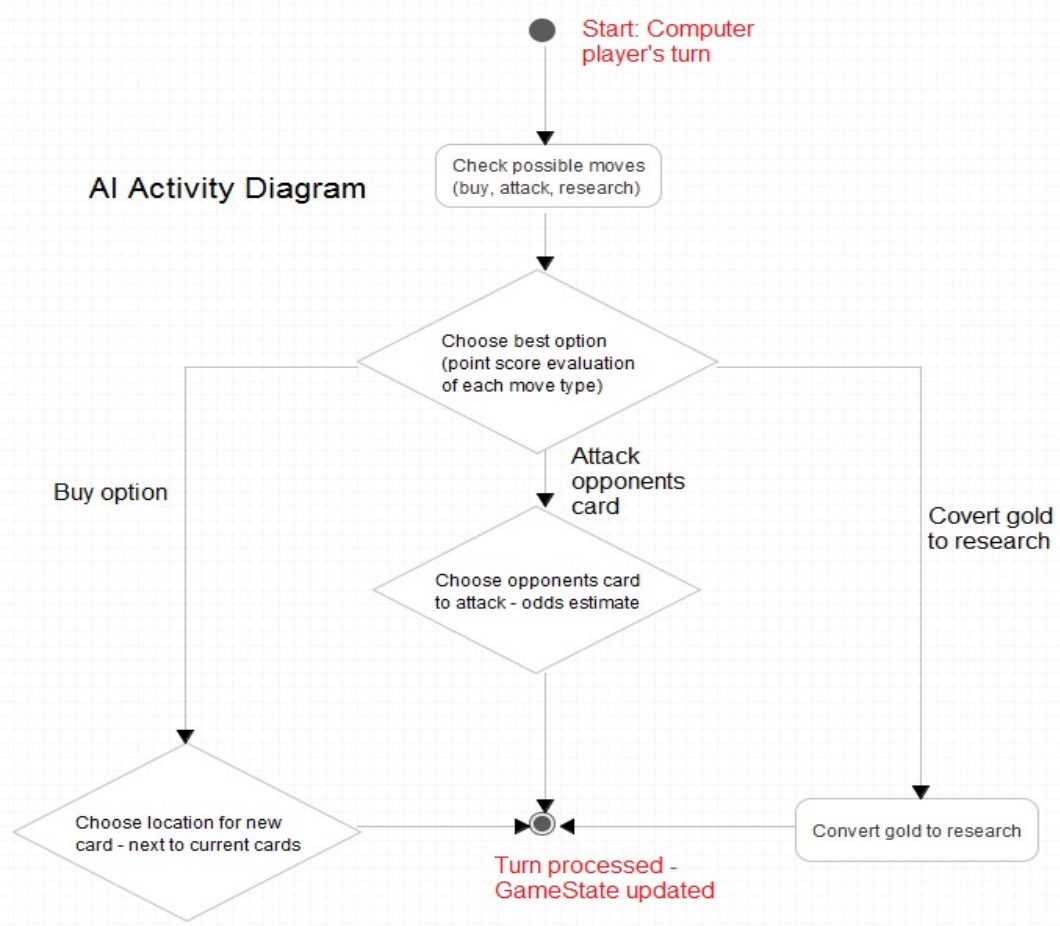
GRP-COSC2635

Silicon – AI Algorithm

This is mainly for Dao and John who will be working on developing an AI algorithm for a computer player in the game.

A computer player can be represented in the code as a Player object with the boolean value for human set to 'false.' With each new turn a check can be introduced to see if the next player is human – if not, the method 'GameControl.computerTurn()' is called. This method will evaluate information from the state of the game and determine the computer's move. Once processed, action will move to the next player. An algorithm for the computer's turn can be developed before writing the code, using shorthand rather than java language. The outline for the computer player's activity is represented below:



The most important choice – type of move to make - can be based on a point score evaluation of each type of move – eg from 0 to 100. At the beginning of the game the buy option will have a high value (100), while the research option will have a low rating (1). When attack moves are possible, they may be evaluated based on the likelihood of winning (comparing card strength to opponent card strength). For example, if the odds of winning are 20 to 5, the attack option can be given a high rating (say 80). The buy card option will decrease in value as the game progresses – each new card is less important to overall victory.

The algorithm should include a check for victory in several moves – for example if converting to research 3 times in a row leads to victory, this option should be given the highest priority (100).

A subroutine should cover the question of where to place a new card on the game board. Ignoring the question of how to code the placement of the card, focus on whether overlapping with opponent cards is desirable or to be avoided. For example, overlapping with a low value opponent card should be advantageous (value of newly bought card is unknown but will probably be higher), while overlapping with a high value opponent card should be avoided.

Other considerations can include routines for aggressive versus passive play – giving a higher rating to the attack option in the case of the aggressive model. Also, attacking with a ‘joker/anti-trust’ card is desirable with the intention of losing the battle, since this card incurs a penalty to the player’s revenue each turn.