School of Computing  
CA326 Year 3 Project Proposal Form

**SECTION A**

Project Title: MTG AI Implementation

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Project Description :

This project aims to create a virtual platform on which a card collecting game of Magic the Gathering could be played alongside creating a program which will be able to compete in a match against another player or another programme. The rules of the game are easy to understand an implement however the longer the game continues the more complex it becomes. Utilizing Pygame and Python we will create a virtual version of the table top game and run it on a server based platform to which other clients (players) will connect. This project will require us to design an effective user interface on which the game will be displayed alongside creation of an AI which will act as an opponent. The Ai will be using the Monte Carlo Algorithm to determine its next best possible while calculating the based on probability of that opponent’s hand what its next best possible move is.   
  
The goal of the game is to reduce your opponent’s life from 20 to 0 using various different cards such as creatures, instants and sorceries. Each card costs a precise amount of a particular resource called land. Each turn one player can play one land card from their hand. Land is divided among 5 colours red, blue, green, white, black. Creatures can attack an opponent to decrease their life total however the defending opponent can block a creature with another creature to prevent being damaged. Instants can be played at any time during a game. Effects of these cards range from damaging opponents to drawing extra cards. Sorceries can only be played on your turn and have similar effects to instants.

The game is divided into 2 main sections.  
***Board:*** This section will include all the perfect information of current cards in play, cards that have been played before and are now in the graveyard, and any special effects currently in play due to special cards.

***Hand:*** This section will include all the cards that the player can play if they have the resources available. A player has perfect information for their own hand but not the opponents hand.

Each player upon joining the game will be able to construct their own deck from 200 available cards. The Ai will be using one of 5 previously pre constructed decks.

Programming languages:

Python 3.6, (Possibly SQL)

Programming tools:

Pygame, eclipse, Linux server

Learning Challenges:

Learning how to set up and run a stable server. How to use Pygame. Implementing complex AI system

Hardware/ software:

PC with Dual boot into windows and Ubuntu