First deliverable - Game strategy - Group 18

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INTRODUCTION

For the second assignment, the Artificial Intelligence for a game of Starcraft Blood Wars is to be designed. All individual units are to be controlled by an agent. In this document, the strategy is explained. The first step is to select a playable race. The authors of this page, who are generally considered nice people, opted to play the complete opposite: the most evil race available, **Protoss**.

RACE CHARACTERISTICS

The Protoss race has some unique features. The working unit, called *Probe*, does not need to be next to a building under construction. It only needs to start construction, then construction continuous autonomous. Furthermore, any building except for the pylon, can only be constructed in the proximity of a *pylon*. Last, the basic offensive unit of the Protoss race, the *Zealot*, is relatively strong and makes a decent simple offensive guide.

STRATEGY

There are three different kinds of resources to be considered. There are the *crystals*, which is the basic resource. Then *Vespene Gas* is a resource that is required for advanced units and buildings. The third resource is of a different kind, it is a population cap, called psi. The main building, the *Nexus*, provides a population cap of 11. Probes occupy 1 spot, zealots 2. All pylons increase the population cap by 8.

Simple buildings and units for protoss only require crystals as resource. Crystals are collected using probes, the more probes that are collecting crystals, the faster the resource is gathered. When the game starts, the first priority is producing a number of probes in order to speed up the resource collection rate. These probes cost 50 crystals each. Once several (about ten) probes are created, the first building should be a pylon, which costs 100 crystals. Pylons create a *Psionic matrix* where other buildings must be warped in. Throughout the game play additional pylons should be build on spots where buildings need to be placed and in order to increase psi.

Once these basic buildings have been created, more advanced buildings are considered. Three buildings are available at this stage of the game: *Gateway*, *Assimilator* and *Forge*. Gateway is a building that is used for creating infantry units, the Assimilator is a building to facilitate vespene gas collection and Forge allows for upgrades on units and enables the *Photon cannon*. The Photon cannon is a defensive building capable of attacking both air and ground targets, usually built around the Nexus for protection. The chosen strategy is to build a Gateway first in order to be able to defend the base with infantry units. This will decrease the chance of losing immediately if the opponents strategy is very aggressive. Next, the Assimilator has to be built on top of a vespene gas geyser in order to collect vespene gas. This resource is used for more advanced technological developments and units. Since these developments are not yet that important to the game, one probe is assigned to the assimilator in order to collect the gas. The next step will be the construction of Forge and Photon cannons subsequently to protect Nexus.

Once the Gateway is constructed, the basic infantry unit that can be created in 25 seconds with 100 crystals is a *Zealot*. The aim is to start producing these immediately when more complexity can be added to the strategy.

COORDINATION AND COMMUNICATION

Since there is no governing intelligence, any agent should make smart decisions independent of each other. In order to prevent multiple agents doing the same thing where only one agent is required, the intelligence of the probes should contain a prioritised list of goals: collect crystals, construct buildings, collect vespene gas. A probe agent should check if there are enough probes collecting crystals, if so, check if a probe is doing constructions, if so, collect gas or crystals.

Buildings should be constructed according to the priorities. If a building is constructed, the goals should be changed accordingly. In the mean time, if time permits, specific goals should be implemented to enable the construction of infantry units while keeping a good distribution of resources.

The intelligence of the offensive units is considered once the amount of the offensive units reaches to a satisfying number. After that the agents can start to take action to attack the enemy's workers or buildings.