

Sprint 5: Idea Behind Bot Implementation

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Buying

To handle the buying aspect of the game, the bot was made to function based on a certain idea, that being, to buy every property it can get access to as the game goes on while also monitoring the number of times the bot has gone around the board. To achieve this, we assumed the number of times the bot would need to have gone around before all the properties would have been bought i.e. we split the game into early and late stages. Initial stages being that the bot has not gone around the board more than 4 times if before 4 revolutions there are enough properties available for our bot to purchase. Of course, considering that the bot is not bankrupt. On the other hand, if the bot was bankrupt, and the bot had purchased a site of type utility, station or site then properties of the specified type are then mortgaged.

Monopoly

For this to work, we ensured that if the bot has a monopoly, houses should be built on properties if the bot isn't close to bankruptcy.

Mortgaging

If the bot became bankrupt or the balance dropped below a certain amount, it was decided that the sites of type utility get mortgaged first as they are not frequently landed on (based on conducted research). The idea was to start off by mortgaging properties deemed "useless" in the sense that they are not landed on frequently and if that was the case you'd want to keep the properties frequently landed on which would help you get out of bankruptcy at a faster rate than the "useless" properties would. Once the bot's balance reaches a reasonable amount, the mortgaged can then be redeemed. To ensure a property with a building can also be mortgaged we ensure to demolish any buildings before mortgaging. Also, as far as mortgaging is concerned, the less frequently landed on sites **(between jail and go to jail moving clockwise)** get mortgaged first before the most frequently landed on sites **(between go to jail and jail moving clockwise)**.

Jail Implementation

Once the game has reached its late stages **(more than 4 revolutions)**, where most properties would already have been bought, we decided to make the bot stay in jail for as long as

possible (use up all 3 turns in jail and then pay 50 on the final turn) in this situation to avoid having to spend money on rent for properties owned by other bots which would save up more money in overtime. If the bot had access to a card that allowed it to get out of jail in the late stages of the game, instead of waiting until the third turn where 50 would have to be paid to get out of jail, we made the bot make use of the get out of jail card on the second turn. This still allows the bot to stay in jail for as long as possible.