Rogue-like games are a subgenre of computer RPG games, featuring procedurally generated environment and permanent death. Winning them is a challenge for a human player, and more so for artificial intelligence (AI). In this work, we present a framework for implementing artificial players for a rogue-like game Desktop Dungeons. We then investigate options of suitable AI creation, and settle for using a genetic algorithm to fine-tune a greedy strategy. The resulting AI was as successful as a mediocre human player, winning the game 72% of the time. This framework and results may be used to improve the quality of rogue-like games, procedural content generators, and artificial intelligence in similar environments.