Problem 1

1.2 Read Turing's original paper on AI (Turing, 1950). In the paper, he discusses several objections to his proposed enterprise and his test for intelligence. Which objections still carry weight? Are his refutations valid? Can you think of new objections arising from developments since he wrote the paper? In the paper, he predicts that, by the year 2000 a computer will have a 30% chance of passing a five-minute Turing Test with an unskilled interrogator. What chance do think a computer would have today? In another 50 years?

Problem 2

1.14 Examine the AI literature to discover whether the following tasks can currently be solved by computers:

- Playing a decent game of table tennis (Ping-Pong).
- Driving in the center of Cairo, Egypt.
- Driving in Victorville, California.
- Buying a week's worth of groceries at the market.
- Buying a week's worth of groceries on the Web.
- Playing a decent game of bridge at a competitive level.
- Discovering and proving new mathematical theorems.
- Writing an intentionally funny story.
- Giving competent legal advice in a specialized area of law.
- Translating spoken English into spoken Swedish in real time.
- Performing a complex surgical operation.

For the currently infeasible tasks, try to find out what the difficulties are and preduct when, if ever, they will be overcome.

Problem 3

2.3 For each of the following assertions, say whether it is true or false and support your answer with examples or counterexamples where appropriate.

A An agent that senses only partial information about the state cannot be perfectly rational.

B There exist task environments in which no pure reflex agent can behave rationally.

C There exits a task environment in which every agent is rational.

D The input to an agent program is the same as the input to the agent function.

E Every agent function is implementable by some program/machine combination.

F Suppose an agent selects its action uniformly at random from the set of possible actions. There exists a deterministic task environment in which this agent is rational.

G It is possible for a given agent to be perfectly rational in two distinct task environments.

H Every agent is rational in an unobservable environment.

I A perfectly rational poker-playing agent never loses.

Problem 4

2.4 For each of the following activities, give a PEAS description of the task environment and characterize it in terms of properties listed in Section 2.3.2.

- Playing soccer.
- Exploring the subsurface oceans of Titan.
- Shopping for used AI books on the Internet.
- Playing a tennis match.
- Practicing tennis against a wall.
- Performing a high jump.
- Knitting a sweater.
- Bidding on an item at an auction