ICS 171, Summer 2000: Homework 1 Solutions

(**3**) For each of the agents in Figure 2.3 (Russell & Norvig, page 37), determine what type of architecture (i.e. table lookup, reflex, goal based, utility based) is most appropriate. Justify your decision (a few sentences should be enough).

(solution from R & N)

Medical Diagnosis: utility-based, because there are trade-offs (long-term health vs. short term pain vs. cost) and uncertainties.

Satellite image analysis and Part-picking robot: if the images or parts can be described well enough, a simple reflex agent will suffice. If we need to make trade-offs between false negatives and false positives, or of the cost of making particular misidentifications (i.e., it doesn't hurt too much to classify a number 3 washer as a number 4 washer, but it is a big problem to classify a hand grenade as a number 4 washer), then we need a utility-based architecture.

Refinery controller: utility based, because there are always uncertainties and utility trade-offs (e.g., safety vs. increasing output of the refinery).

English tutor: A hard problem because we don't have as good a model of the human language learning process as we do of the physics of refineries or images. Many successful tutoring programs have nevertheless chosen a series of goals, and operated in a goal-based manner.