cis20.2-spring2010-sklar, lab IV.1
intelligent systems lab
5 POINTS EXTRA CREDIT

- This lab will give you an opportunity to apply the concepts discussed in the lecture on intelligent systems.

- In this lab you will design a DECISION TREE for your project. Refer to lecture notes IV.1 (May 4), pages 21-22, for an explanation of Decision Trees.

- THIS LAB IS AN OPTIONAL ASSIGNMENT FOR CREDIT. You may submit it in class on May 18 in order to get some EXTRA CREDIT toward your term grade.

1. Think in general about the types of choices that your user needs to make when using your system. For example, in lecture IV.1, the user has a choice between dinner, a movie and a concert.
   List below the things that your user can choose:

2. Now think about the constraints associated with each choice. For example, in lecture IV.1, we said that the movie was playing at 7pm and 9pm, and the concert was only happening at 7pm. Dinner could be any time. This means that there are three constraints:

   (movie $\xrightarrow{at}$ 7pm), (movie $\xrightarrow{at}$ 9pm), (concert $\xrightarrow{at}$ 7pm).

   List below the constraints in your system:

3. Now draw the decision tree on the back of this page, illustrating the possible choices the user can make, given the constraints you have listed.

(draw the decision tree here)

4. Now think about any costs associated with each path in your decision tree. Costs might be expressed in dollars. Costs might be expressed in terms of time (how long will the concert take, how long will dinner take, how long will it take to travel to the concert, to travel between the concert and dinner, and to travel home after dinner). Costs might be expressed in terms of distance (how far is it between home and the concert, between the concert and dinner, between dinner and home).
Define the costs that make sense in your system, and try enumerating the costs for some of the paths in your decision tree (on the back of the other page).

5. You could enumerate costs for all the paths if you have a small decision tree, but if you have many paths in your tree, this could take a long time. Think about how you might compute the costs automatically. We mentioned *depth-first search* at the end of the May 4 class. Illustrate how you would perform a depth-first search on your decision tree and use that to calculate the cost of each path.

6. Finally, think about how you might try to implement this "intelligence" in your system. Design a software modification that you could use to implement your ideas. Write pseudo-code for it on the next page. Refer to any database tables you might need. Explain which page(s) of your user interface would be affected.

(write your software modification design here)