CS 458/558 - Default Final Project

The Teleology of Technology

Some decision making domains are unstructured or even ill-defined. For most people, deciding what to wear or eat or what movie to see or even whom to date are such domains. While there may be many **wrong** answers for these areas, it is often the case that there is no demonstrably **right** answer. These domains have a lot in common with politics - the VOTE domain - in that they involve subjective choices, and are often influenced by relationships or history, rather than by clear facts.

Some decision making domains, like medicine or computer science, often have actual right answers. There are facts. There are clear outcomes. Even so, in a domain like medicine, it is not always the case that the standard practice is right for every patient. For example, something as common as a blood transfusion may not be appropriate for a patient who has religious objections to the procedure. Some people would rather die than compromise their convictions.

This is VOTE territory.

We pose a seemingly simple technology decision: what kind of computer should I buy? A Mac or Windows PC or Linux machine? How much memory? How big a screen? Desktop or laptop or notebook or tablet? How much am I willing to pay?

Implicit in the technical choices are the set of goals that the user wants to achieve. Most people don't buy a computer just for sake of owning a computer. They want to do stuff with it - surf the internet, edit videos, use facebook or skype, run a business, create music. You get the idea.

The point is that there is a **teleology** to technology. There is a design and purpose to the many features of computers. I don't want to get all theological here - I am not arguing that your iPhone is proof of the existence of God.

However, I am not arguing against that point of view. The point is that in making decisions about technology, you are on firmer ground than most political decisions. Technology, by God, has a demonstrable purpose and can help users achieve their goals.

Write a function `whichpc`, which takes a person object instance as an argument. As in VOTE, the person has a set of preferences, a collection of relatinships, and possibly a history of prior decisions.

The output is a recommendation tailored to that person's requirements and preferences, stating which machine they should get and why. It might also discuss the reasons for NOT getting another type of machine.

Hard as it may be for a computer science person to accept, it is possible that the recommendation is for the person not to get any computer. Again, there needs to be an explanation.

We recommend that you incorporate qualitative arithmetic into the program, given that you have to deal with quantities such as price, memory size, screen size, disk space, etc.

Additional Notes

I understand that some of you are looking at this program as requiring creating a database of hundreds or thousands of computers from which to make recommendations. That is really not what I had in mind. The challenging and interesting part of this problem is not creating a vast database or graph of computers. The point is to come up with a detailed and nuanced taxonomy of the users.

From my perspective, you could have just a couple of dozen types of machines, with orthogonal characteristics. You then need to come up with a user classification system that accounts for why a person actually needs a computer.

This line of analysis applies to other domains that students are exploring, for example, recommending movies or books or restaurants or automobiles. The computer program has to have a fine grained understanding of the person for whom the recommendation is being made.

Imagine that you have a restaurant with 1,000 items on the menu. If all you know about the customer is how many

calories they desire and to what foods they are allergic, you are not going to make very pertinent (or appetizing) recommendations. The answer to that problem is not to put more items on the menu. Rather, it is to get a better model of the customer.

That principle applies to the pc recommendation domain. The system will not get better by adding hundreds of models if the model of the user is impoverished and does not reflect the diversity of goals that may occur.

One of the key features of VOTE which applies to this domain is the decision strategy. VOTE had over a dozen strategies which served to mediate the decision and also to generate the explanation. In the pc recommendation domain, decision strategies might include:

- buy a computer like your brother's so he can help you.
- don't buy computer X, because that's what I had before and it was unreliable.
- buy computer X because it is compatible with my smart phone.
- buy computer X because it runs software Y which I need to do Z.
- buy computer X because store Z is having a sale and providing a 3 year service agreeement.

Most marketing pitches can be viewed as decision strategies. The advertisement is giving you an explanation for buying their product.