6.872 Project Proposal

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A. Problem

Doctors need an easy way to determine what prognosis to give patients based on a particular set of cancer information. In addition, patients would like to be presented with relevant prognostic information when learning about their cancer situation.

B. Existing Solutions

There exist a few online prediction tools that attempt to predict cancer recurrence. One such example are the prediction tools housed on the Memorial Sloan Kettering Cancer Center website[1]. These tools take as input specific data about an individual's previous cancer and then provide a single number that represents the chance of cancer recurrence. Our proposed system would improve upon these tools: first by focusing on the prognosis of a patient recently diagnosed with cancer; second by providing survivability rates, risks, and expected quality of life of each type of common treatment for the cancer.

C. Our Approach

Our web application is designed to help doctors have an easier way of determining what the general prognosis should be for the patient and provide a way for doctors to discuss these results with the patients. Our goal for our 6.872 project is to test out our proposed web application with the dataset of a single type of cancer, most likely breast cancer, and then examine its usefulness.

a. Doctor's perspective

Doctors will be able to use the website to enter information that has already been diagnosed about the patient such as cancer type, the stage of the cancer, cancer location and other health conditions. Our system will take that information and determine what is the likely prognosis for the patient; providing the doctor with information such as the disease free survival rate and the progression free survival rate. Our system will then divide these prognosis statistics by common treatment, as well as display the risk and the relative quality of life of the patient if they were to undergo certain treatments.

b. Patient's perspective

Our system will have the ability to produce a one page document summarizing all prognosis information about a specific type of cancer. The goal of this document is to encourage discussion between the patient and the doctor about the risks and rewards of different treatments. Thus, the data will be displayed in a format that allows the doctor to quickly and efficiently walk the patient through all treatments. This document is designed to be printed and handed to the patient during the clinical visit. If paper is not available the document can also be emailed to the patient but should still displayed on a tablet or computer during the clinical visit.

c. Technology Stack

Our system will be housed on a web application, making it easy for physicians to access our data without having to install any programs. The web application will be constructed using a Django/Python backend and a sqlite database. Existing cancer data will be taken from Vanderbilt Medical School and other data sources discovered in week one of our project timeline.

D. Timeline

In order to reach our deadline of Dec 4th, we have divided up the next four weeks with estimate deliverable of what we need.

Week	Goals for week
Week 1 (11/4 - 11/11)	• Find data from Vanderbilt Medical School or from other sources • Design the UI/architecture of system
Week 2 (11/11 - 11/18)	• Build out the architecture
Week 3 (11/18 - 11/25)	• Build out the method for calculating prognosis
Week 4 (11/25 - 12/2)	• Test UI/modify the diagnostic code • Work on paper
Week 5 (12/2 - 12/9)	• Finish Paper • Prepare for the presentation • Update the code accordingly

E. References

[1] "Memorial Sloan Kettering Cancer Center." *Memorial Sloan Kettering Cancer Center*. N.p., n.d. Web. 01 Nov. 2014.