Joshua Diehr

Cody Rash  
Cory Pregizer

18 December 2019

Dr. Azar

Mental Health System Report

**Anticipated Work:**

At the beginning of the semester we set out to improve upon various elements of the MHS, and add an additional component. The anticipated improvements involved changes to the text-mining process, GUI/UI, database, and the diagnosis system itself. Populating the database with the entirety of the DSM was also a key goal of the semester. The addition of a special condition system allowing for better diagnosis was also a goal for the semester.

**Work Completed:**

Text-Mining Process: the text mining process involves a single Python script that preprocesses patient input to gather key terms for use in the diagnosis process. This script is used upon the creation of a patient in the system to convert the patient’s problem description into the words category in the database. Members Involved: Josh

GUI/UI Improvements: Changes were made to existing GUI in order to accommodate the changes in the diagnosis system. A single question is asked per-panel in the diagnosis system. This panel now display the ID of the most likely illness (keeping the name confidential from patients) and the percentage match with that illness. Generic questions are put into the panel with the addition of a symptom to give the question purpose. This panel is looped until an illness is determined. The report panel no longer gives the user a choice in diagnosis, but instead reports the found diagnosis and percentage match. The addition of patient lookup has allowed for reevaluation of patients. Patients can now be selected from the doctor’s view then opening an editing form. This editing form allows for changes in the users information and then the reevaluation of the new information. The value of gender was also added to the table and question panel as gender can affect certain results for the patient. Members Involved: Cody

Database Reconstruction: A new data model was necessary to accommodate the new diagnosis system. Less patient data is stored after the diagnosis since the same results will be determined with reevaluation. Patient-Words is a new column that saves what keywords/symptoms were found. Patient-Symptoms stores which symptoms were evaluated, but not necessarily found(This means the patient was asked about the symptom and no longer needs to be asked again). The question table now stores generic questions that require a symptom to have meaning. The symptom table replaces the keyword table from the previous model. For disorders a new column called WordMatch contains notable words and symptoms. NonSymptom is a table designated to be used with special conditions. Lastly the Keywords and Thesaurus tables are no longer in use. Members Involved: Josh

Diagnosis System: The new system first gathers notable words through the text-mining process. These words are not necessarily symptoms, but may hold value pertaining to certain disorders. These words are compared to all illnesses in the database and scores are calculated in relevance to the number of words/symptoms shared between them. Once the scores are calculated they are then sorted by the highest value. Questions are then asked pertaining to symptoms not found in the patients input, but found in the highest ranking disorder. Based on the user’s response to the question the scores are reevaluated with the new symptom. This process is continued until a percentage of 50 or greater is achieved. This diagnosis is then displayed to the user and submitted in the database. All symptoms added during the questioning process are then added to the patient’s data in the database at this time. Members Involved: Josh, Cody, Cory

Data Population: All illnesses in the DSM have been added to the database with the exclusion of one chapter. This remaining chapter will be added when teaching future collaborators the methods used in the system. Symptoms and notable words have been extracted and added to the database. Generic questions have been created and added to the database with connection to their symptom counterparts. Various special conditions have been defined, but not yet added to the database. Members Involved: Josh, Cody, Cory

**Incomplete Work:**

Special Condition System: This system was meant to filter disorders by required special conditions. These special conditions would then add to the diagnosis percentage. But due to short time constraints, this task was not able to be fulfilled with the amount of time we had to complete the project.