

Easy Diagnosis

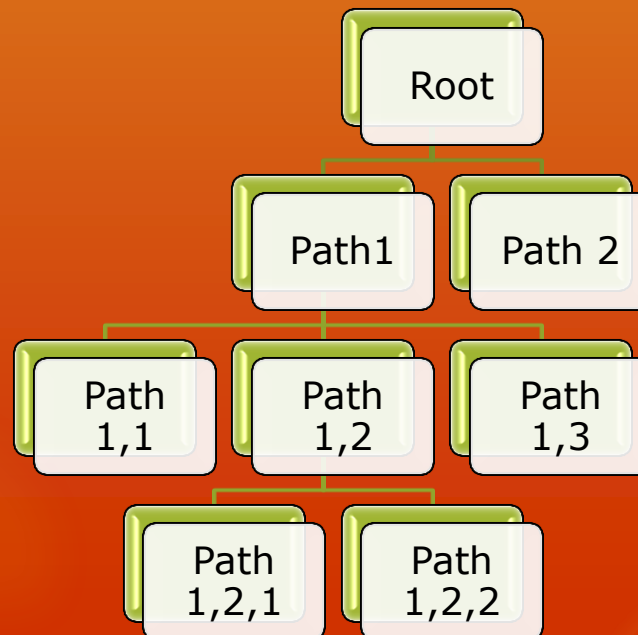
“Talk about your feelings from
the comfort of your own couch”

Introduction

- Easy Diagnosis is a conversational agent program for the purpose of exposing a patients symptoms in attempt to conclude with the best diagnosis.
- A+ options include HCI, Data Mining, and Testing

HCI Option

- System will display patient's current emotional state
- Current diagnosis and a history of how the diagnosis has evolved will also be displayed
- A decision tree of the conversation path will be shown



Data Mining

- System uses a MongoDB to store information on each conversation that a user has with the agent
- Stored information will include the points given to each symptom shown, disorders considered, trigger words used, and the final diagnosis
- This data will be used to correlate which words are most commonly used by patients exhibiting certain symptoms or with a particular diagnosis

Testing

- After the system is finalized, its accuracy of diagnosis will be fully tested
- Each disorder will be researched in order to act as a patient with that disorder while interacting with the agent

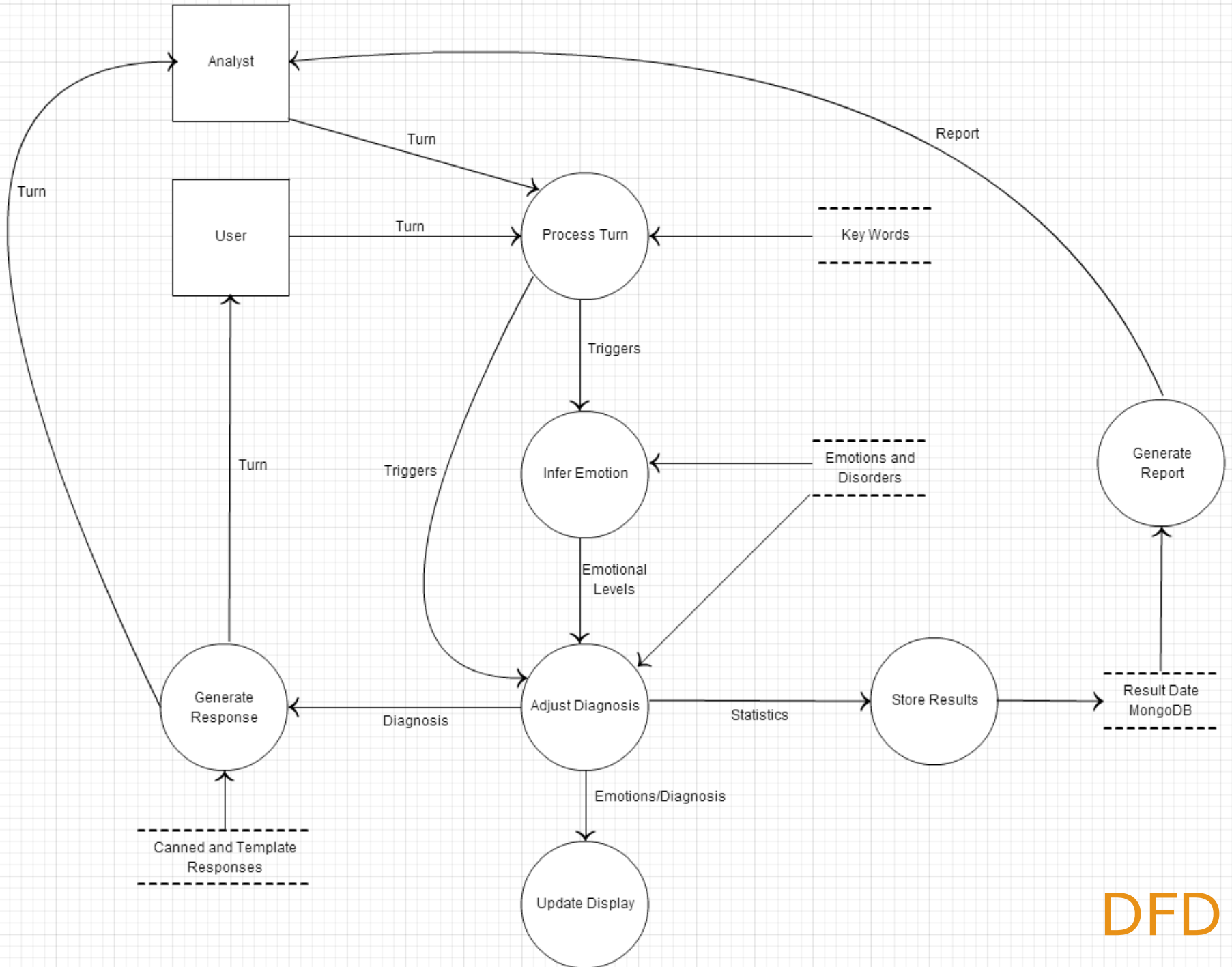


The System

- Each phrase entered by the user is analysed by each word individually and each sub phrase of increasing length
- A hash table is then searched with each word and phrase to look for a match
- If a match is found the value returned is an array of integers representing that word or phrase's weight towards each symptom and disorder
- The system then decides upon a response based on the current position in the conversation tree, picking from the possible directions at random

The System (continued)

- At this point the users statistics are updated with the points returned from the hash table
- Then the display is updated to show any changes in the users emotional state, the newest diagnosis, and paths added to the decision tree



DFD

Sample Conversation 1

- Welcome, you are now speaking with a mental health professional, for best results please participate fully and answer any questions in detail.
- Feel free to speak openly and discuss any sensitive topics as this conversation is completely confidential.
- You: Hello
- Doc: Hello, I'm Dr.Feelgood. Why don't you begin by telling me about yourself, what is your name?
- You: I am Luke
- Doc: And what do you like to do with your spare time?
- You: God tells me how I should act
- Doc: That's quite interesting, do you often have time for fun?
- You: I have been chosen for greater things
- Doc: What about family, do you have any siblings?
- You: I am of no other, I have been spawned from Christ himself
- Doc: Do you have any family members that you don't get along with?
- You: The world is my family, and all speak to me as one
- Doc: Now that I know a little about you, can you tell me the reason you are here?
- You: God has spoken to me and shown me visions of a future I must create, I hear voices of those in need
- Doc: Are you experiencing any emotions more often than normal?
- You: Praise and joy comes from helping those in need
- Doc: Is there anything in your life that makes you sad?
- You: There are many people I cannot help, they must help themselves
- Doc: Is there anything in your life that makes you happy?
- You: With my gifted hands, all are healed
- Doc: Why is it that you have come to seek help now, what has changed?
- You: I see things that no one else can see, God is testing me and I shall not fail

Results

○	-----
○	Symptoms displayed:
○	-----
○	Happines: 0
○	Excitement: 8
○	Anger: 0
○	Agression: 0
○	Sadness: 6
○	Fear: 0
○	Anxiety: 0
○	Confusion: 4
○	Memory Loss: 0
○	Cognitive Loss: 0
○	Delusion: 20
○	Hallucination: 11

○	-----
○	Calculated possible diagnoses:
○	-----
○	Manic Disorder: 480
○	IE Disorder: 80
○	Depression: 490
○	Bipolar Disorder: 0
○	Anxiety Disorder: 0
○	Amnesia: 60
○	Alzheimer's: 80
○	Schizophrenia: 1240

Sample Conversation 2

- Welcome, you are now speaking with a mental health professional, for best results please participate fully and answer any questions in detail.
- Feel free to speak openly and discuss any sensitive topics as this conversation is completely confidential.
- You: Hi there
- Doc: Hello, I'm Dr.Feelgood. Why don't you begin by telling me about yourself, what is your name?
- You: Gregory
- Doc: And what do you like to do with your spare time?
- You: I work and party
- Doc: That's quite interesting, do you often have time for fun?
- You: Yah quite a bit
- Doc: What about family, do you have any siblings?
- You: One older brother
- Doc: Do you have any family members that you don't get along with?
- You: no they all are nice
- Doc: Now that I know a little about you, can you tell me the reason you are here?
- You: I have mood swings quite often, sometimes I'm really sad and other times very angry
- Doc: Is there anything about your thoughts that concerns you?
- You: I think about hurting people if I'm really mad, or myself when I'm sad
- Doc: Is there anything in your life that excites you?
- You: I can't wait to go snowboarding!
- Doc: Is there anything in your life that makes you happy?
- You: Yah I like to try new things, I can do anything pretty much
- Doc: Why is it that you have come to seek help now, what has changed?
- You: I was really sad yesterday and attempted suicide, I think I need help

Results

- -----
- Symptoms displayed:
- -----

○ Happiness:	0
○ Excitement:	0
○ Anger:	12
○ Aggression:	3
○ Sadness:	21
○ Fear:	1
○ Anxiety:	1
○ Confusion:	0
○ Memory Loss:	0
○ Cognitive Loss:	0
○ Delusion:	6
○ Hallucination:	0

- -----
- Calculated possible diagnoses:
- -----

○ Manic Disorder:	10
○ IE Disorder:	630
○ Depression:	2575
○ Bipolar Disorder:	0
○ Anxiety Disorder:	89
○ Amnesia:	0
○ Alzheimer's:	0
○ Schizophrenia:	24

Sample Conversation 3

- Welcome, you are now speaking with a mental health professional, for best results please participate fully and answer any questions in detail.
- Feel free to speak openly and discuss any sensitive topics as this conversation is completely confidential.
- You: Good morning
- Doc: Hello, I'm Dr.Feelgood. Why don't you begin by telling me about yourself, what is your name?
- You: My name is Sarah
- Doc: Do you have a job?
- You: Yes, I work at Walmart
- Doc: That's quite interesting, do you often have time for fun?
- You: Yes but I tend to avoid social interaction
- Doc: What about family, do you have any siblings?
- You: I have 2 sisters
- Doc: Do you have any family members that you don't get along with?
- You: Sometimes my sisters can really get me on edge
- Doc: Now that I know a little about you, can you tell me the reason you are here?
- You: I'm quite restless most of the time, and I can't concentrate either
- Doc: Is there anything about your thoughts that concerns you?
- You: lots of the time my mind goes blank when im in public
- Doc: Is there anything in your life that frustrates you?
- You: I've been having the same nightmare for about a week now
- Doc: Is there anything in your life that frightens you?
- You: When I get really worried i get frozen and cant think or do anything
- Doc: Why is it that you have come to seek help now, what has changed?
- You: I've started to stay away from work because I cant handle being so anxious all the time

Results

○ -----	
○ Symptoms displayed:	
○ -----	
○ Happiness:	4
○ Excitement:	0
○ Anger:	0
○ Aggression:	0
○ Sadness:	9
○ Fear:	10
○ Anxiety:	10
○ Confusion:	0
○ Memory Loss:	0
○ Cognitive Loss:	4
○ Delusion:	0
○ Hallucination:	0

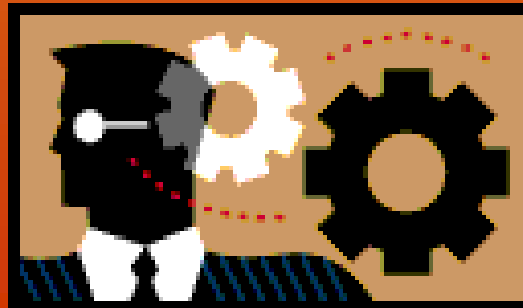
○ -----	
○ Calculated possible diagnoses:	
○ -----	
○ Manic Disorder:	220
○ IE Disorder:	0
○ Depression:	735
○ Bipolar Disorder:	0
○ Anxiety Disorder:	2440
○ Amnesia:	20
○ Alzheimer's:	120
○ Schizophrenia:	80

SDLC

- Original plan was a basic waterfall model
 - Too much design up front, needed to implement sooner
 - Had to adapt to changing requirements and iterative/incremental development
- Switched to an Agile approach
 - Planned for the current week
 - Focused on releasable builds
- Waterfall was too linear for my work habits and schedule, Agile allowed more flexibility and faster gratification

Challenges

- Scheduling a full course load with large projects in two classes, a Work Study project, and three jobs
- Creating a smooth and believable conversation
 - Relied heavily on asking questions rather than analysing responses for meaning
- Implementing enough features for A+ requirements



Rewards

- Project was a great learning experience
- Documentation helped gain appreciation for planning projects better
- Its fun to talk to the agent to see what disorder it diagnoses



Questions

