

COSC 310 – 001
Software Engineering
2021 Winter Term 2

Project Plan Document

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1.0 Project Description

The project was created for the UBC Okanagan third-year level course.

Psych Bot's goal is to give the user psychological advice*. This bot serves as an interactive conversational agent that takes the user's input (a sentence) and outputs an appropriate response. As this assignment does not require Machine Learning implementation, the chatbot may provide a reply that may not relate to the user's prompt.

* For legal reasons, neither the bot nor developers are certified to provide medical help.

Github Repository:

<https://github.com/KentonMewling/Psych-Bot>

2.0 SDLC

2.1 Rationale

After the first meeting with all team members, our group decided to use the **Agile Development Methodology** to develop the chatbot. The decision was based on analyzing the app's functionality – creating a chatbot. Since our team consists of people with vast background experience in a selected programming language, and the ability to work on each functionality, the incremental development will allow us to complete this project with best practices. Furthermore, completing every step in the SDLC by necessity will enable us to be more flexible than a plan-based approach (e.g., Waterfall Methodology). In other words, creating functionality, like Natural Language Processing, will be redundant as Python and its package management system (PIP) will provide all necessary functionality to build the app in time.

2.2 Task Breakdown

2.2.1 Requirements Analysis

1. Product: Interactive chatbot capable of responding to the user's input with appropriate responses.
 - a. The chatbot should be developed using an Object-Oriented Programming Language.
2. Chatbot's Task: The chatbot should play the role of a psychologist capable of answering the question in a field-related manner.
3. User's Task: The user should have a conversation with the chatbot by entering questions related to the bot's assigned task.
4. End Goal: The program must hold a full and meaningful dialogue with the user for a minimum of 30 turns of conversation.

2.2.2 System Design

1. Programming Language: Python and its libraries will be used to develop the chatbot.
 - a. Existing Python libraries will be used to process and analyze user responses.
2. The Dialogue: Possible responses to the user's questions will be stored in a text file.
3. Output and Prompts: The first version of the chatbot will be terminal-based, which means that the user's and chatbot input/output will be displayed in the command-line GUI.

2.2.3 Implementation

1. Create a JSON-based file that contains conditions and patterns that the chatbot should use for user responses.
2. Implement a class that will parse the JSON-based file.
3. Implement a class that will handle the conversation with the user based on their input and patterns/conditions stored in the JSON file.
 - a. If the input is unknown to the chatbot, print out a random response that should have a meaningful answer.
4. Create a file containing the chatbot's purpose and explain how to run it.
5. Make a well-documented code that will allow other developers to understand and read the code.

2.2.4 Testing

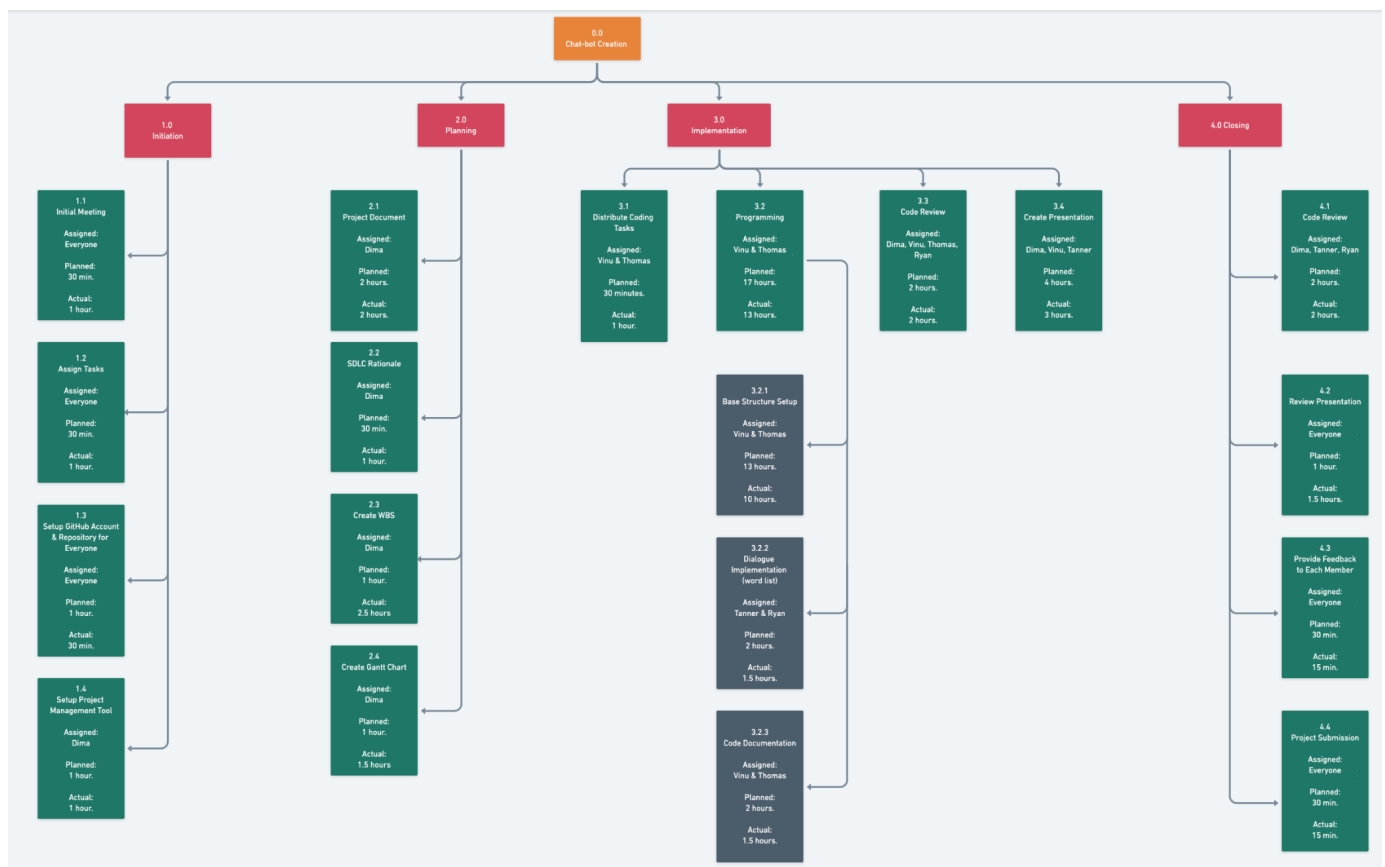
1. Test the chatbot by entering the responses used in the JSON file.
 - a. Ensure that the chatbot understands the most common “yes/no” answers patterns.
2. Test the chatbot by entering the responses that are not in the JSON file.
 - a. Ensure that the program will return a meaningful response.
3. Review the documentation of each class and method.
 - a. Ensure that code documentation is understandable to everyone
 - b. Ensure that code documentation has no grammar/spelling errors.
4. Test program for any exceptions or crashes.

2.2.5. Evolution

1. The program must evolve to meet changing requirements of the user and market.
2. The program must be modified in case of errors or vulnerabilities after the delivery.
3. Update test cases based on new functionality.

3.0 Work Breakdown Structure

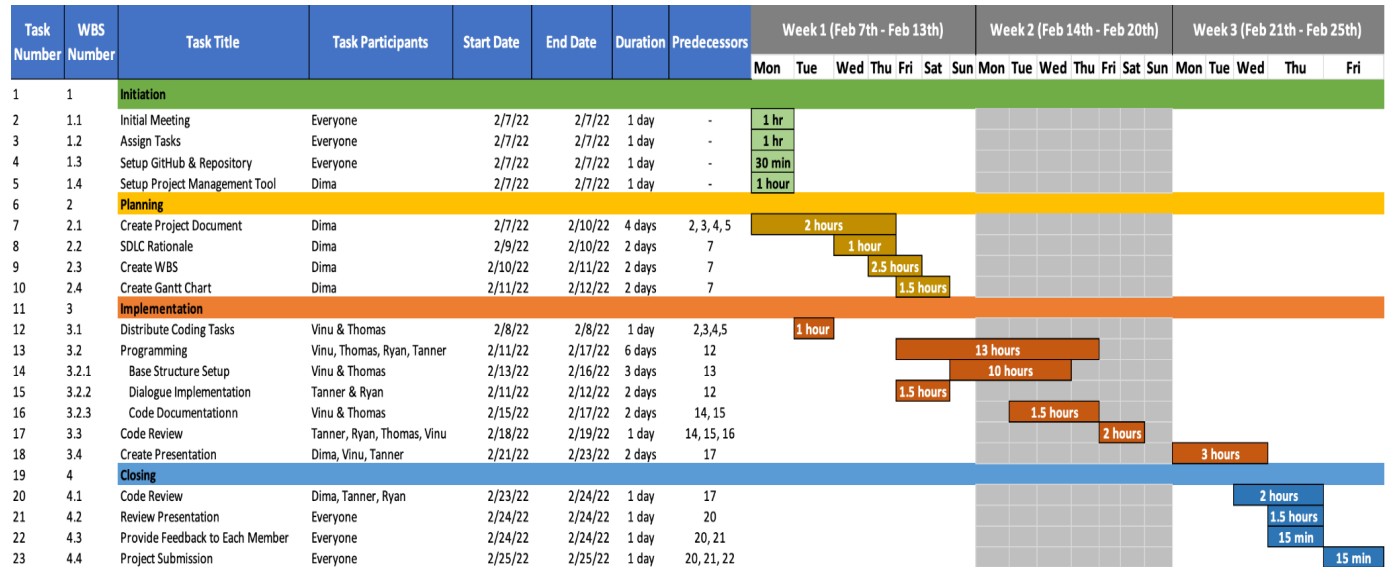
The Work Breakdown Structure below is based on the tree-like structure. The root (title of the project) has four subtasks representing each project stage. Each subtask shows its subtasks that were performed during the time of this project. Each subtask has a title, assignees, estimated time of completion, and actual time of completion of the task.



See the [README](#) file for a larger version of the file.

4.0 Gantt Chart

The Ghant Chart below represents a tree-like structure based on the WBS but condensed into a schedule-like form. Unlike WBS, this chart contains more detailed information on the start and end date of the task, what task should be completed first to be processed with the next one.



See the [README](#) file for a larger version of the file.

5.0 Project Limitations

At this stage of the project, the chatbot is not capable of performing the following tasks:

- Unable to handle incorrect spellings.
- The sample model of available answers is limited.
- The chatbot is not trained on unknown responses.
- Unable to recognize different parts of speech.
- Unable to identify synonyms.

6.0 Sample Output

6.1 Proper Conversation Handling

6.1.1 Proper Conversation Handling #1

```
Hello, I am Psych-Bot. What is your name? Tanner
Hello Tanner.
I am glad to have you here today, How are you feeling?
- good
How long have you been feeling like this?
- a while now
Has a doctor ever prescribed medication to you to help with depression, anxiety, behavior, or mental problems (such as Ritalin, antidepressants, etc.)?
- no they have not
Have you sought out any professional medical service in the last 30 days?
- no I have not
Have you ever been placed in a psychiatric hospital?
- yes i have
what was the reason you were in a psychiatric hospital?
- I was having bad dreams and panic attacks
Have you had any suicidal thoughts lately?
- no i havent
What about any thoughts about self-harm?
- nope i have not
Have you though of hurting others?
- no i have not either
Have you ever been arrested or charged with a crime before?
- Yes I have
What was the crime that you committed?
- Theft
When was the last time you committed a crime?
- Monday morning
Do you have any support groups like friends or family that you can talk to?
- I have my family
Have you tried including your friends in your support group?
- No they don't udnerstand me sometimes
Are you actively working right now?
- no I dont work anymore
When did you last work?
- About 3 months ago
What was your reasoning for leaving?
- I didn't like the job anymore
How are you paying for your bills at the moment?
- I'm living with my parents
Have you been taking any non-prescribed drugs?
- no i quit drinking a while ago
Good. Drugs and alcohol can be highly addictive.
Are you doing any physical activities?
- I was on a soccer team a while ago but not anymore
You should look for some group sports its good for your mental health.
Do you play any games or video games in your free time?
- yes i do
What is your favorite game?
- Minecraft
Why is that your favourite game?
- I like the creativity
That's good to hear, it's good to have a stress reliever that you can have at any moments notice
- yeah thats why i enjoy it so much
Okay that wraps up our session for today. For homework this week you should write down how you are feeling each day on a scale from 1-100. Can you do it for me?
- yes i can thank you
Do you have any other questions?
```


6.1.2 Proper Conversation Handling #2

```
Hello, I am Psych-Bot. What is your name? Tanner
Hello Tanner.
I am glad to have you here today, How are you feeling?
- bad
How long have you been feeling like this?
- a long time now
Has a doctor ever prescribed medication to you to help with depression, anxiety, behavior, or mental problems (such as Ritalin, antidepressants, etc.)?
- yes i have been prescribed meds before
What were they prescribed for?
- anxiety
Did they seem to help?
- not really thats why im here talking to you
Are you still on this medication today?
- yes but i dont think it helps much
Have you sought out any professional medical service in the last 30 days?
- nope this is my first time
Have you ever been placed in a psychiatric hospital?
- no i have not
Have you had any suicidal thoughts lately?
- yes i have
Is there any reason why?
- i have been feeling lonely and depressed lately
What about any thoughts about self-harm?
- no i have not
Have you though of hurting others?
- no i would never
Have you ever been arrested or charged with a crime before?
- no i havent
Have you ever committed a serious offense that you never took legal action for?
- yes I have before
Do you have any support groups like friends or family that you can talk to?
- I have my friends but nobody else
Have you tried including your family in your support group?
- I haven't talked to them in a long time
Are you actively working right now?
- yes i am
Where are you working?
- McDonalds as a cook
Do you enjoy working there?
- no not really, it is stressfull sometimes
How are your coworkers? Can you tell me something interesting about one of them?
- They are all kids and one of them has blue hair
Have you been taking any non-prescribed drugs?
- yes i have been taking drugs
Drugs and alcohol can be highly addictive, you should try to refrain from taking them in high quantities.
Are you doing any physical activities?
- yes im on a baseball team
How about any social organized events?
- no i like being alone
You should look for some group sports its good for your mental health.
Do you play any games or video games in your free time?
- no i broke my computer and cant afford to fix it
How come you dont play games?
- i dont like them anyways
Video games are a great way to relieve stress and are available almost always so you should try to find a game that you may enjoy. It can really help brighten ones mood!
```

6.1.3 Proper Conversation Handling #3

```
Hello, I am Psych-Bot. What is your name? Tanner
Hello Tanner.
I am glad to have you here today, How are you feeling?
- awesome
How long have you been feeling like this?
- forever now
Has a doctor ever prescribed medication to you to help with depression, anxiety, behavior, or mental problems (such as Ritalin, antidepressants, etc.)?
- yes a ton of them
What were they prescribed for?
- bipolar disorder and some other stuff
Did they seem to help?
- sometimes, i dont like taking them though
Are you still on this medication today?
- no i dont use it really
Have you sought out any professional medical service in the last 30 days?
- yes i have
Have you ever been placed in a psychiatric hospital?
- yes a few times
What was the reason you were in a psychiatric hospital?
- i was hearing voices in my head
Have you had any suicidal thoughts lately?
- no not really
What about any thoughts about self-harm?
- yes sometimes
Have you thought of hurting others?
- yeah only people i dont like though
Have you ever been arrested or charged with a crime before?
- yes i have
What was the crime that you committed?
- assault
When was the last time you committed a crime?
- today
Do you have any support groups like friends or family that you can talk to?
- no nobody
Have you tried talking to your friends and family about how you are feeling?
- no i havent talked to them in a really long time
You should have someone outside of therapy to talk to about these feelings you are having.
Are you actively working right now?
- no i dont work
When did you last work?
- i never have
What was your reasoning for leaving?
- i dont like working at all
How are you paying for your bills at the moment?
- i dont pay anything
Have you been taking any non-prescribed drugs?
- yes a lot
Drugs and alcohol can be highly addictive, you should try to refrain from taking them in high quantities.
Are you doing any physical activities?
- yes i do
How about any social organized events?
- yes i do DND
Good, physical activity and socializing with others is good for your mental health.
Do you play any games or video games in your free time?
- yeah i play some games
```

6.2 Improper Conversation Handling

6.2.1 Improper Conversation Handling #1

The situation below shows that the chatbot doesn't "learn" from the previous user's responses.

```
Do you have any support groups like friends or family that you can talk to?
- I have my friends and family that have been here for me
Have you tried including your family in your support group?
- yes?
```

6.2.2 Improper Conversation Handling #2

The situation below shows that the chatbot doesn't recognize the sentence's meaning correctly. In other words, we provided a sarcastic response to the bot, but it assumed that the sentence was related to the real-world situation.

```
Have you ever been arrested or charged with a crime before?  
- yeah in video games but not real life no  
What was the crime that you committed?  
- it was in a game  
When was the last time you committed a crime?  
- never
```