

# Sentience

## Overview of Sentience program:

Sentience is a basic deep learning chat bot. It will become more intelligent over time as its database is expanded. Right now it's current training model has been kept simple. It has a decent sized database that it uses to respond to a user's statements and questions. It will respond in a variety of ways based on what settings the user chooses. Users also have the ability to use both text and audio to communicate with the chat bot which has been named "Caprica"; who can also speak through text or sound. If you don't have a microphone then you can't use it if you do, then the option exists for you to use it.

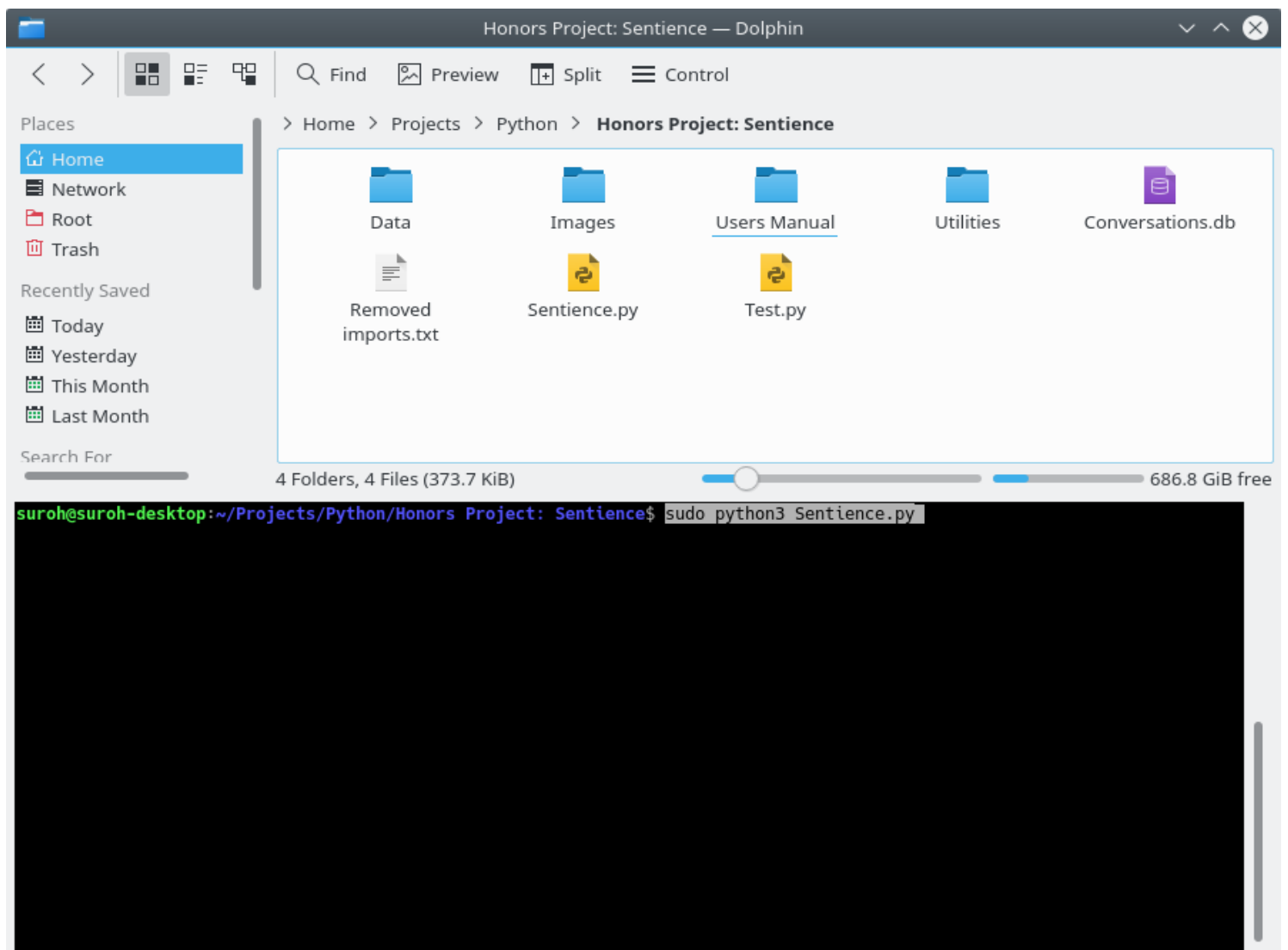
All conversations with Caprica are stored and can be written to Data files. These files can then be used to enhance her training. The purpose of this documentation is not to explain what this program is but rather how to use it. Though if I have enough time I will add a much deeper explanation of this program and my intentions on furthering data on. So let's begin, the guide starts on the next page.

## Index

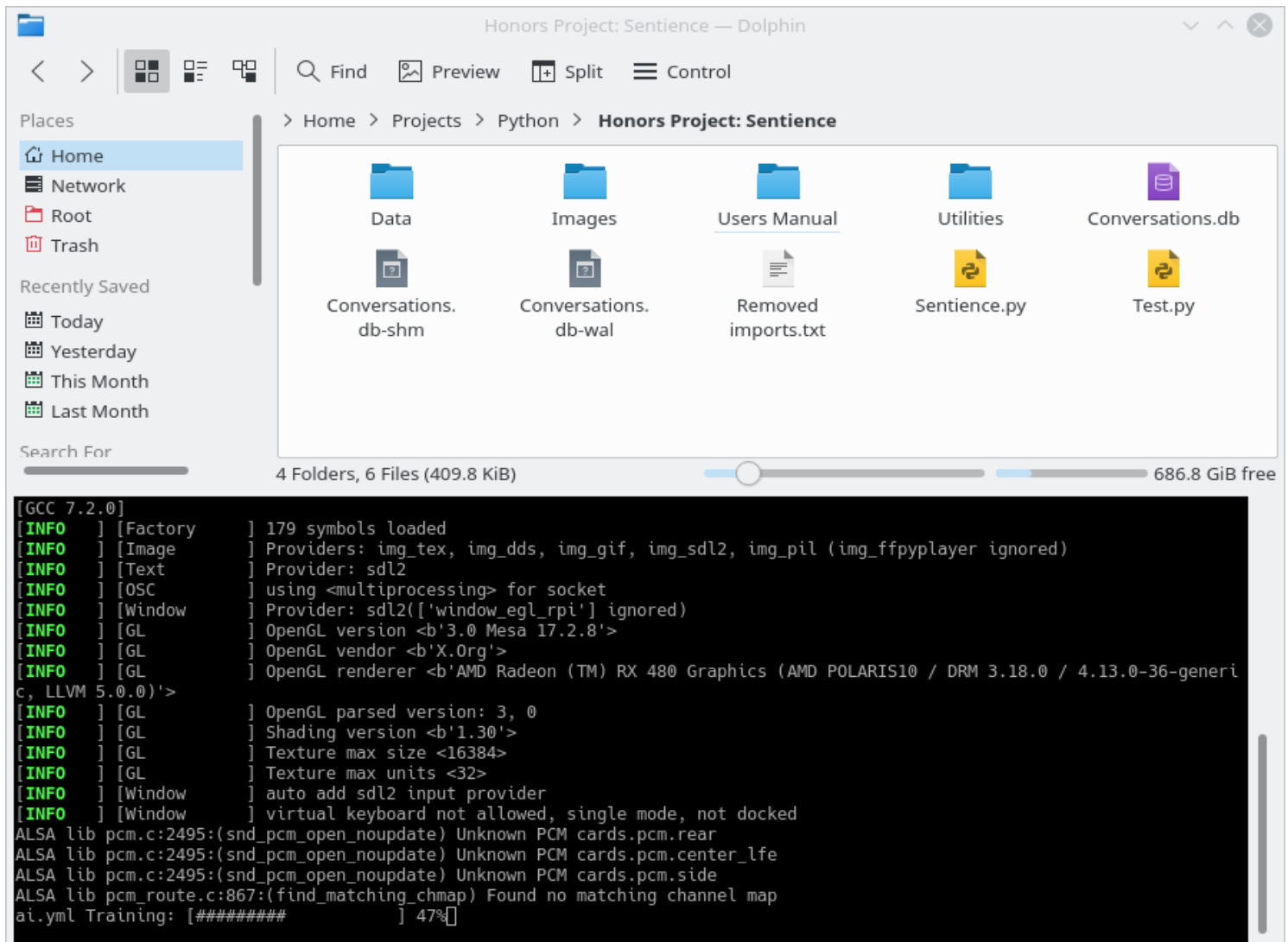
- 1) Overview of the Sentience program
- 2) Index
- 3) Linux Instructions: Changing Directories, navigating to the project.
- 4) Linux Instructions: Running the project
- 5) Linux: This is what the program looks like
- 6) Enabling user audio
- 7) Disabling user audio
- 8) Erasing text in the conversation log box
- 9) Enabling the users microphone
- 10) Disabling the users microphone
- 11) Unable to record the users voice
- 12) Begin recording the users voice
- 13) Write the stored users conversation to a text file
- 14) Select and print the users conversation file
- 15) Support open source (explanation of penguin picture)
- 16) Select your operating system
- 17) Creating a user profile on Linux
- 18) Deleting a File
- 19) Deleting all files generated by this program.
- 20) Talking to Caprica through a text box
- 21) Reading Caprica's responses in a text box
- 22) Creating a user profile on windows.
- 23) Windows instructions: navigating to the programs path
- 24) Windows instructions: opening an administrator command prompt
- 25) Windows instructions: changing command prompts directory
- 26) Windows instructions: Running the program
- 27) Windows instructions: First run fears
- 28) Windows instructions: This is what the program looks like
- 29) Important: When to interact with your program.
- 30) Important: When not to interact with your program.
- 31) Linux installation instructions
- 32) Windows installation instructions Part 1
- 33) Windows installation instructions Part 2
- 34) Linux File Locations
- 35) Windows File Locations
- 36) Documentation

## Linux Instructions:

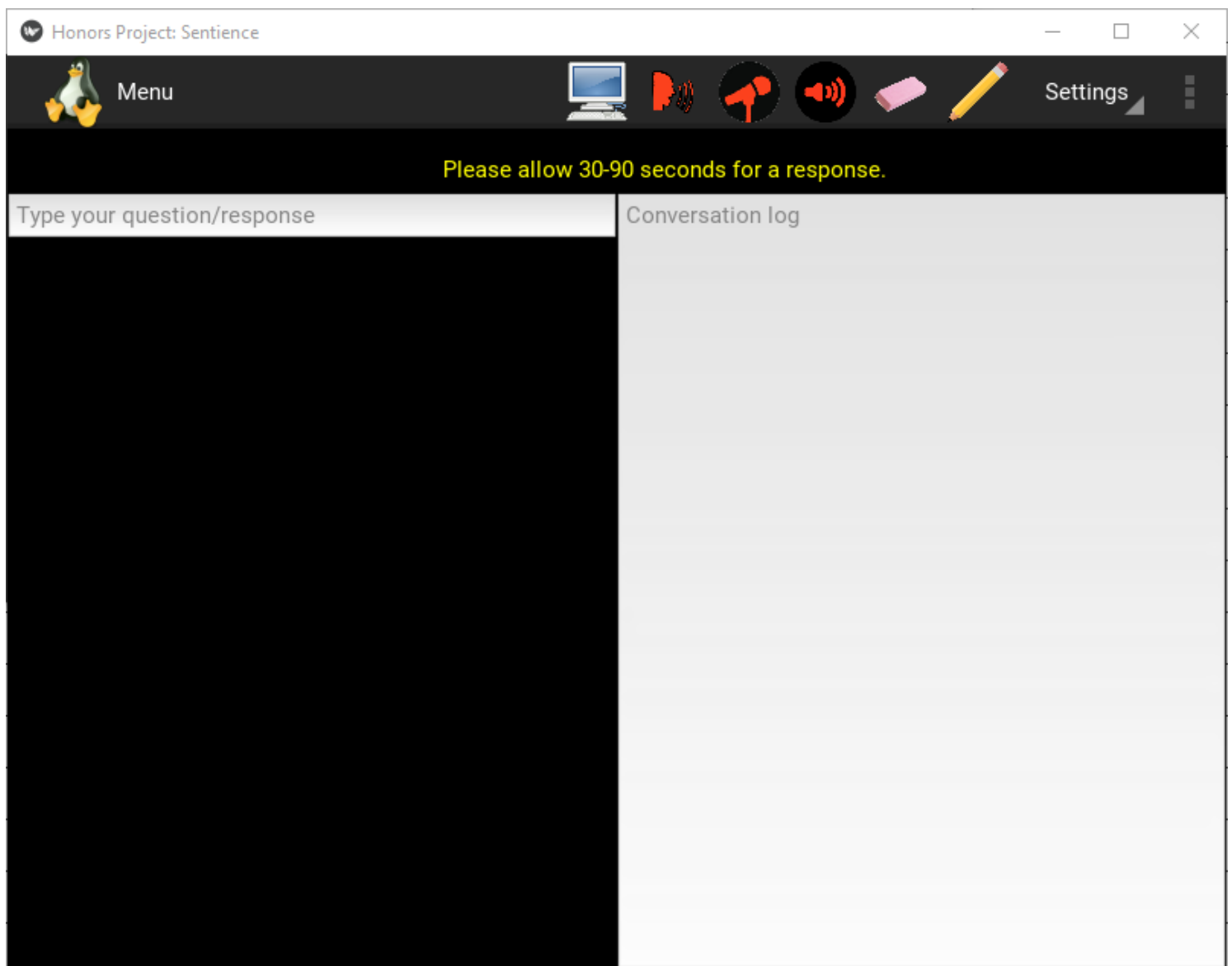
Open the folder you've stored this program in. It should be named "Sentience" by default. Open up the terminal in Dolphin by hitting the "F4" key. You can also open a terminal and use the command `cd` with the full path, Eg "`cd Sentience`" as you should be in your home drive by default when you open a terminal. If not simply type either "`cd`" enter or "`cd~`" both these commands do the same thing. Once on the intended screen it should look similar to the image<sup>1</sup> below.



In the last image<sup>1</sup> a bit of text in the terminal was highlighted. It read “python3 Sentience.py”. This is the command that you will use to run the program. Go ahead and type in “python3 Sentience.py”. Once you do that you should see something similar to the following image<sup>2</sup>. If you receive any errors please scroll to the end of the document and view the requirements for this program. The training for this program is moderately intensive depending on your system. The program may appear as if it's crashed, but you'll notice that the training doesn't end. Once the training has completed the program should run just fine; so don't get worried and close it out.



Once the training has finished the program should look like following image<sup>3</sup>. Now the fun begins right? The next slide(s) will break down and explain what everything does! The description of the following components applies to all operating systems until specified other wise.



This is the “Audio Disabled” Button<sup>4</sup>. When this button, which is located on the menu bar, is red. The audio for the program is disabled. This means that the only way that “Caprica” can communicate with you is through text. If you simply click this button it will turn blue. Once blue “Caprica” will respond in audio to the user. The “Audio Enabled “ Button will be covered on the next slide.



This is the “Audio Enabled<sup>5</sup>” button that was mentioned in the Previous slide. This button is located in the same place as the “Audio Disabled” button on the menu bar. Now that this button is blue “Caprica” will respond to the user in audio. If you decide that you don’t like this option. All you need to do to disable it, is click it again. Clicking this button will turn it red again. You can switch between audio and text responses from “Caprica” as many times as you like.



This is the “Eraser” button<sup>6</sup>. When you click this button it will Erase all of the text in the large box labeled “Conversations Logs”. Don’t worry if you’re not sure what that is yet because we’ll Be covering that soon. Fear not though here is a basic explanation. The “Conversation Log” box displays all of the text conversations. This means that every text response you send to “Caprica” and that “Caprica” sends to you, will be stored inside this box. Don’t worry About reading the information stored in this box as all conversations Can also be written to the hard drive. For later use be it personal or Training the chatbot in future. If there is no text in the box clicking on This button wont do anything. Clicking on this button does not change The image like most of the other buttons.





This is the “Microphone Disabled” button<sup>7</sup>. This button which is red, and like all other buttons is located on the menu bar. When this button is red the microphone is disabled. This means that the user can only communicate with “Caprica” through text. This button does not effect “Capricas” audio function. It only means that the user is unable to use his or her microphone to communicate with “Caprica”. Clicking this button will give the user the ability to use a microphone to communicate with “Caprica”. Once clicked this button will turn blue if you decide to disable the microphone again simply click the blue button and it will again turn red and appear as it does below. The “Microphone Enabled” button will be covered in the next slide.



This is the “Microphone Active” button<sup>8</sup> which is located on the menu bar. When this button is blue, the user has the ability to communicate with “Caprica” using a microphone. Clicking this button when it’s blue will disable the microphone and turn it red. Don’t worry, you can turn the microphone on and off by clicking this same button over and over again. When it’s red, the mic is disabled. When it’s blue the mic is enabled. Notice how I said “Enabled”? In order to actually speak with “Caprica” you need to click the record button which will be covered next. This may seem like a bad idea but I assure you it’s wise. All you need to know about this button, is, when it’s blue you can speak to “Caprica” with a microphone. When it’s red, you can’t!



This is the “Record Disabled” button<sup>9</sup>. When this button is red you don’t have the ability to speak to “Caprica” with your microphone. Clicking on this button when it’s red will prompt you to first click the red “Microphone Disabled” button that was covered earlier. This will be stated to the user in the “Conversation logs” text box. Clicking on the red “Microphone disabled” button will cause this button to turn blue, as well as the “Microphone Enabled” button.

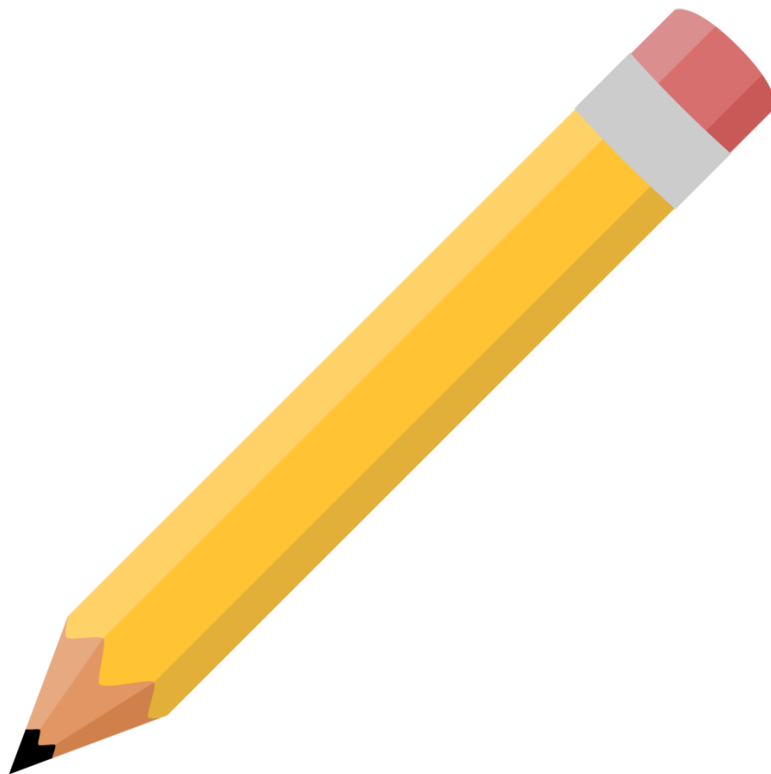


This is the “Record Active” button<sup>10</sup>. Once this button is blue, click it, speak into your microphone clearly and then wait 10-20 seconds for an audio response from “Caprica”.

If you no longer want to use the microphone to communicate with “Caprica”. Simply click on the blue “Microphone Active” button to disable the microphone.



This is the “Write Logs” button<sup>11</sup>. Do you remember earlier when I said that your conversations with “Caprica” were stored? Well, clicking on this button will take that conversation and write it to a text File. That text file can be found in various places. All of which are listed at the end of this manual. What you need to know about this button is this. If you don’t speak with “Caprica” and you click this button an empty text file will be created. If you decide however, that you do want to speak to “Caprica” and then have a text file to remember the conversation that you had with her. Clicking this button will take that entire conversation and write it to a text file on your hard drive!



This is the “Printer” button<sup>12</sup>. Clicking this button will cause a new window to popup. This new window will allow you to navigate to the file containing the user conversation with “Caprica” that is created by clicking the “write logs” button. If you click this button and the file doesn’t exist you can always just use it to print another file.

Seriously, no errors are generated by clicking this button. If the file I intended that you print doesn’t exist just close the dialog by clicking The “close” button on the popup window. You need to first speak with “Caprica” and then use the “Write Logs” button to create the file.

Once you’ve located the proper file (what ever you want to print) just click the “Print” button on the popup window. The file paths for the generated files can be found at the end of this tutorial along with other helpful information. If you need the specific page number please return to the index on page two.

This is not clickable. It's nothing more than an Icon. I put this image<sup>13</sup> of a Penguin in this program to show my support for Linux operating systems and the open source community. I implore all users of computers to stop supporting companies such as Microsoft and Apple that are ripping you off and providing you with terribly overpriced software. Software that you can quite literally find free, comparable and or better versions of. Don't believe the "Industry Standard" lies that you're told. The industry standard is created by us. If you want to see the prices of these things go down then stop buying them. If you want tuition at state universities to go down. Stop using overpriced software that colleges spend tens of thousands of dollars on yearly (or more, and more often depending on the College) don't believe the "public officials" and that tell you this isn't true. Use your brain, common sense should dictate reality. Why use the overpriced and crappy software? Use free software that's better, more supported, and created by the people who intend to use it themselves. Not by the people that want to take your money and abandon you with decaying poorly written software.

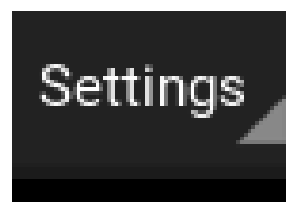


This is the “Select OS” button<sup>14</sup>. If you’re using Linux this button isn’t meant for you. You can click it, but it won’t do anything. If you’re using Windows this button is meant for you. Clicking this button will make three Text boxes appear under the text box labeled “Type your question/response”. The three text boxes that appear will enable you to create a user profile. One box will enable you to insert a username, Age, and gender. After inputting this information the boxes will again disappear. There is Another method for linux and mac users to create a user profile. Unfortunately there is a bug on windows systems (kivy bug) which is causing issues with the other method of creating a user profile. Once that bug is resolved this option will be removed. Until then it remains. All you need to know about this button is this. When you click this button it will make three boxes appear, Username, Age, and Gender. Click on each one in order and input your choices, hit the “Enter” key respectively, one at a time, as you finish typing in each Box. Once you’ve hit enter in one of those boxes, that box will disappear.



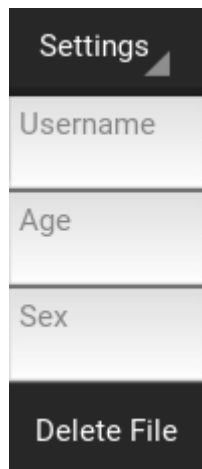


This is the “Settings” button<sup>15</sup>. If you’re a Linux or Mac os user you can click this button to display a drop down menu. In this drop down menu are three text boxes. 1) Username, 2) Age, 3) Sex click on each one, respectively, and type in your choice. Eg, Click on the box labeled “Username”, input a username that you want, and then hit the “enter” key on your keyboard. Do this for Age, and sex as well. This process creates a “user profile”. This profile will enable you to have, store, and write multiple conversations with “Caprica” and different users. Each user will have a text file created for them when the “Write Logs” button is clicked. You can then print these logs. Please note that you can only print one Log at a time based off of the current user. This was done intentionally So that each file would be deleted after it’s been printed. The reason behind this Is that these files can quickly pile up on you. While they’re normally very small, if you use them for training Purposes, they could become quite large.



Settings
Username
Age
Sex

This is the “Delete File” button. You access this button by clicking on “Settings” as seen in the image<sup>16</sup> below. When you click on the “Delete File” button a popup window will appear. This will allow the user to navigate to any location on their desktop and delete a specific file. The user simply has to select the file they wish to delete and then click the button labeled “delete” on the popup window. It’s suggested to the user that they only delete files generated by the program using this feature.



This is the “\*\*Delete All\*\*”<sup>17</sup> button. Just as the name implies when You click on this button it will delete all files generated by this Program. Furthermore, clicking on this button also has the effect Of immediately closing the program. Don’t worry, you can re-create The files when you next run the program by simply re-running it. It’s suggested that the user ignore this feature, unless you’ve begun A conversation which you don’t want anyone to see. This button is Located on the Menu bar, you can access it by clicking on the “Settings” button as seen below.



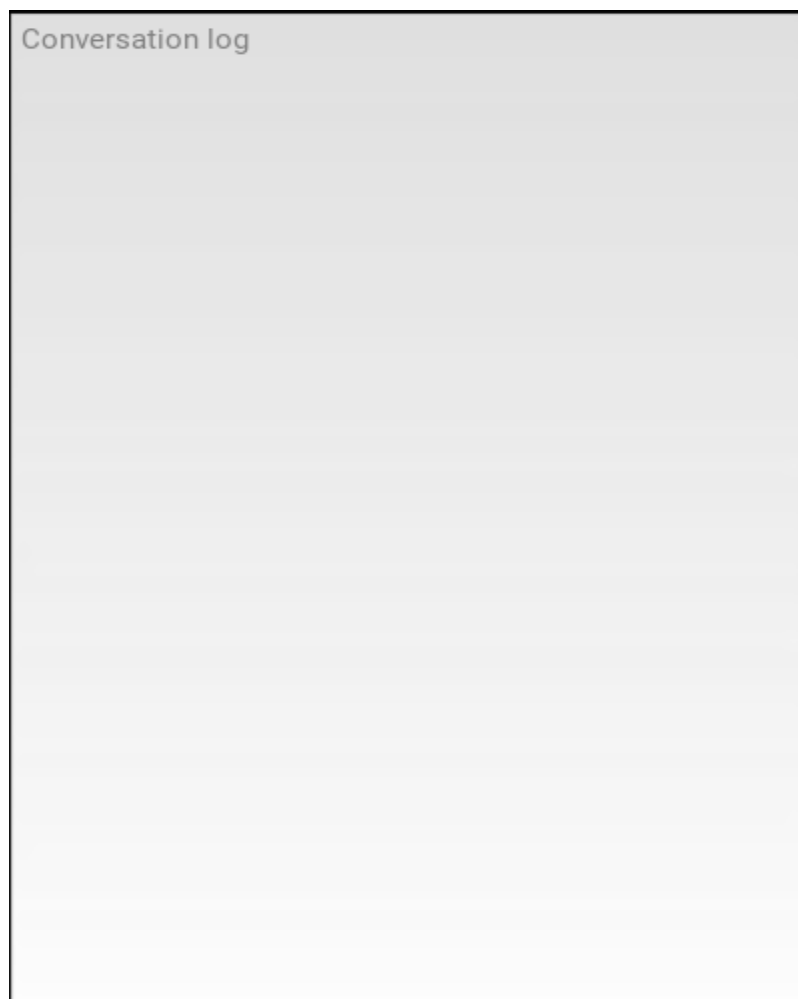
This is the text box<sup>18</sup> where you will type all of your questions, statements, and responses to “Caprica”; if you’re using the text option and not the microphone option. The shorter and more “normal” the question the more coherent answer you will receive from “Caprica”. Remember this AI requires learning. It’s not smart to begin with, it gets smarter over time, a lot of time. All you need to do with this box is this. Type something into this box, and then hit the “enter” key on your keyboard. After you hit enter a response will be generated by “Caprica” and displayed in the large box labeled “Conversation log” to the right of it. Continue to type into this box to continue your conversation with “Caprica”.

Please understand that this program is using a large database so that it can generate the best possible response to the users statement. This means that it could take between 15-120 seconds to get a response back from the chatbot. It may look like your program has crashed but rest assured that it’s working just fine!

Please do not interact with the program while it searches for an answer.

Type your question/response

This is the “Conversation log” box<sup>19</sup> that’s been mentioned a few times throughout this manual. As the user you will not directly interact with this box at all. You can click on it, and type in it. But it won’t do anything. This box will display all text responses generated by “Caprica”. It will also display certain warning messages when you click on certain buttons that haven’t been properly activated. You can clear (delete) all of the text in this box by clicking on the “clear logs” button (the eraser button covered earlier).



In order to create a user profile on windows operating systems  
Users must click the “Select Os” button spoken about on page 16.  
Once users have clicked that button three TextInputs<sup>20</sup> will appear  
Below. Simply enter the information into each box in order.

For instance:

In the username box enter: “selected username” then hit enter.

In the Age box type: “numerical age” then hit enter.

In the Gender box type: “Sex” then hit enter.

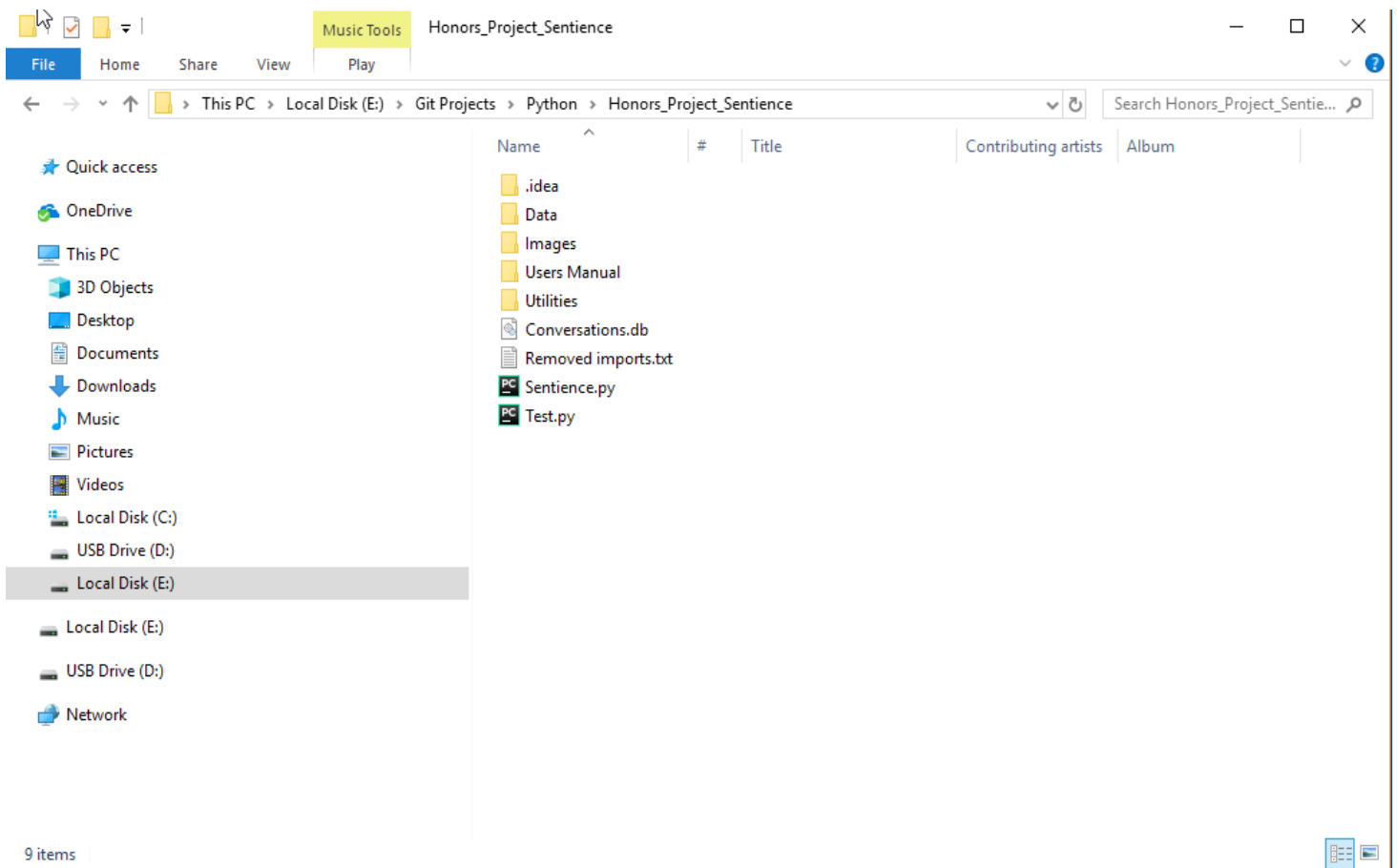
When you type the information into a box and hit the enter key

That box will disappear from the screen.

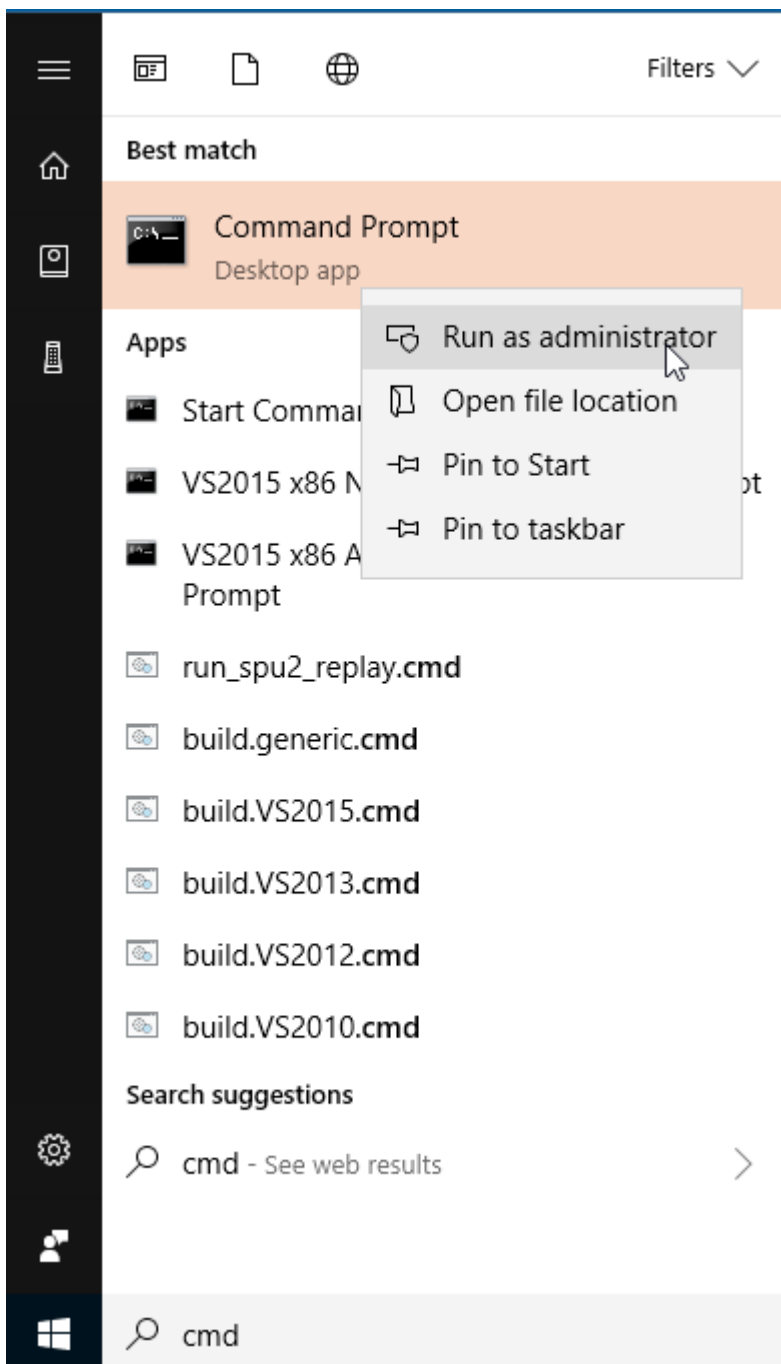


# Windows Instructions

Getting this program working on windows is essentially the same as it is on Linux. The first thing you should do is open the folder that you've stored this program in. It should look similar to the image below, note, your folder<sup>21</sup> and path will be different.



The next step is to open your command prompt. Please open the command prompt as “Administrator”. You can open the command prompt by locating your menu<sup>22</sup>, opening it and typing “cmd” into the search box. To run the command prompt as administrator just right click “Run as administrator”.



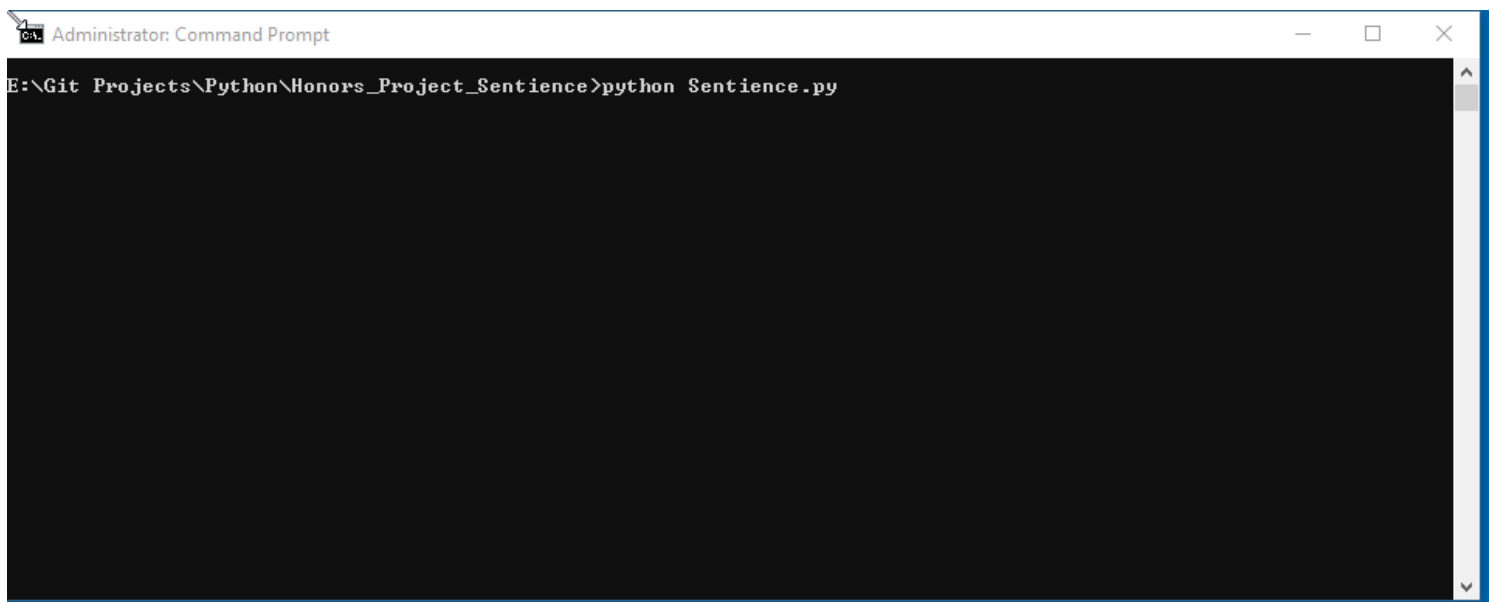


Once the command prompt<sup>23</sup> has been opened. You need to change directories. You must navigate to the path where you've stored this program. That's why I had you open it earlier. Go ahead and copy the path of the program. Type "cd " and paste that copied path into the command prompt. It should look similar to the image below. again, The path on your machine will be different. Once you've typed the above information in. Just hit the "enter" key on your keyboard. you're now in the proper directory and can run the program.

A screenshot of a Windows Command Prompt window titled "Administrator: Command Prompt". The window has a black background and white text. The command prompt shows the current directory as "E:\>" and the user has entered the command "cd E:\Git Projects\Python\Honors\_Project\_Sentience". The command is highlighted in blue. The window has standard Windows window controls (minimize, maximize, close) in the top right corner.

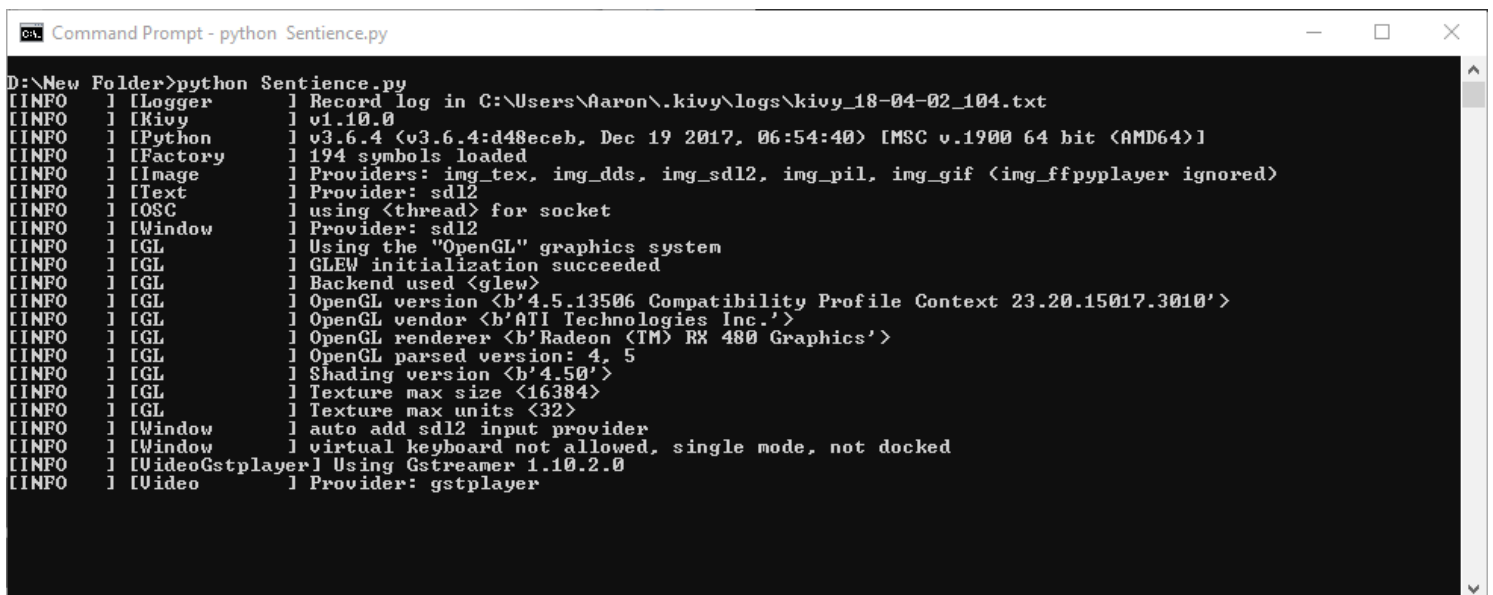
```
Administrator: Command Prompt
E:\>cd E:\Git Projects\Python\Honors_Project_Sentience
```

Now that you're ready to run the program, all you need to do is type "python Sentience.py" into your command prompt<sup>24</sup> and then hit the "Enter" key on your keyboard.

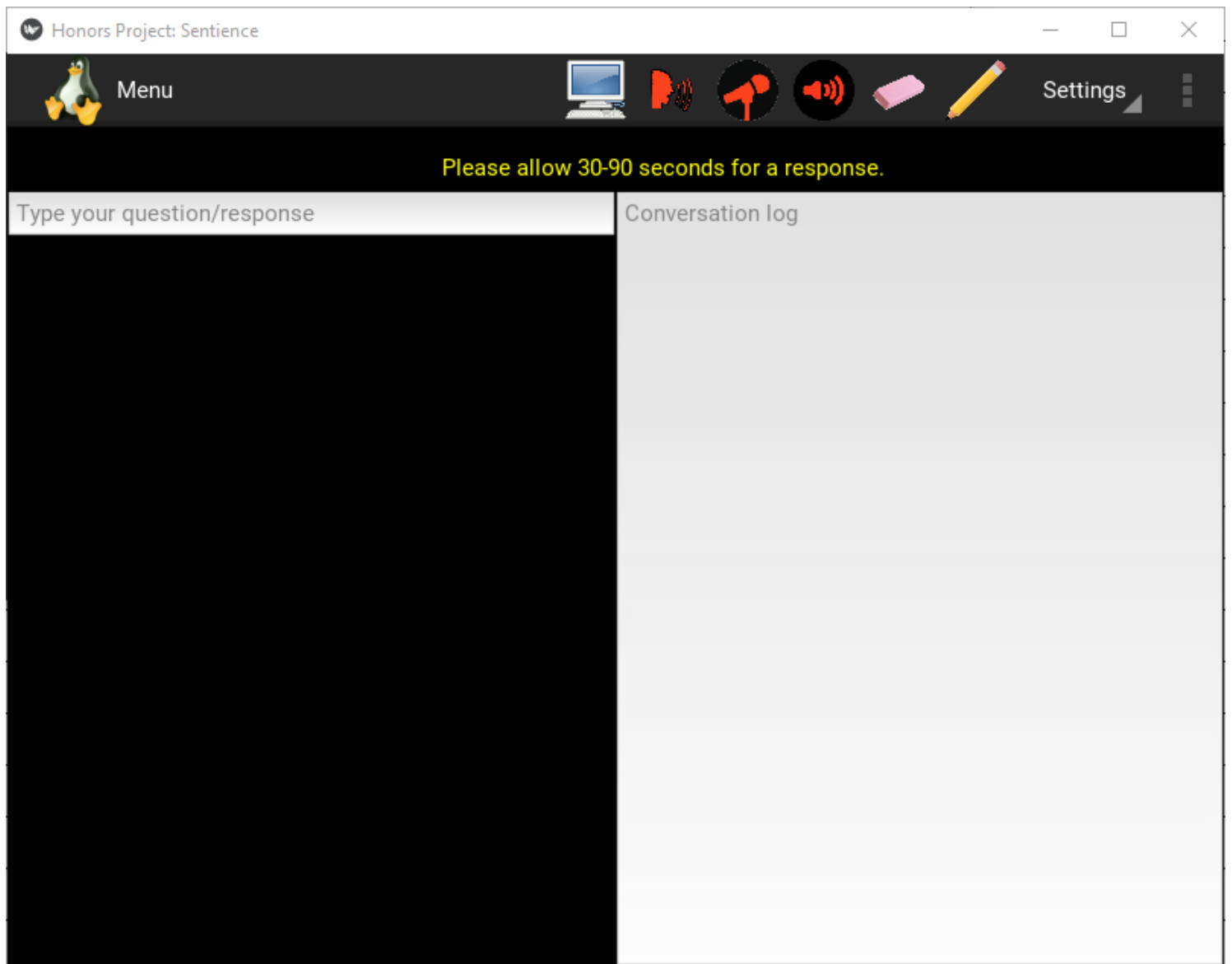


```
Administrator: Command Prompt
E:\Git Projects\Python\Honors_Project_Sentience>python Sentience.py
```

Once you've run the program it should look similar to the image<sup>25</sup> below. You can view this box at any time while you're running this program. Do not close this window, closing this window will close the program. If at anypoint in time you believe that your program has crashed you can verify this by simply looking at this window. As long as it looks like this you'll know that the program has not crashed!

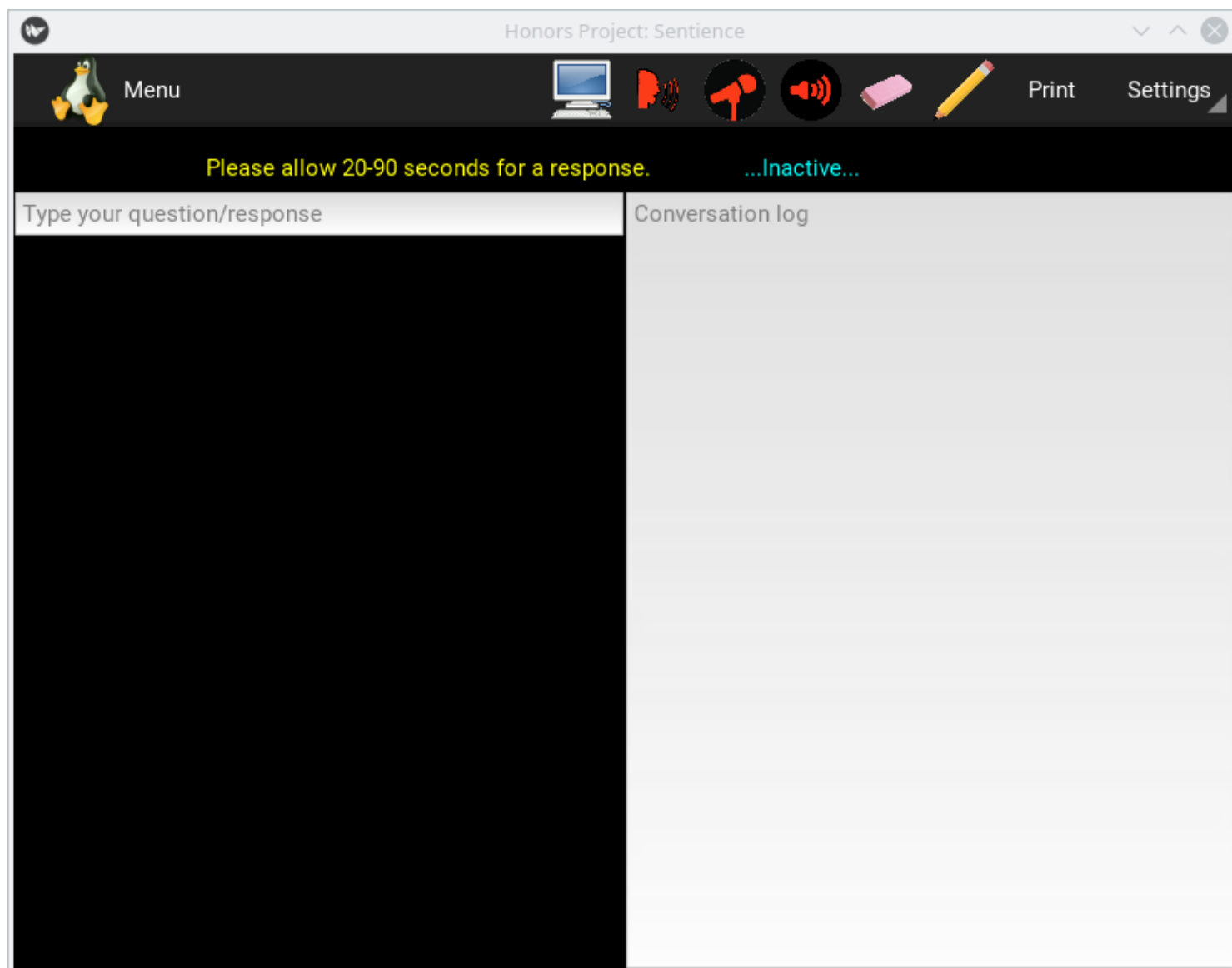


```
Command Prompt - python Sentience.py
D:\New Folder>python Sentience.py
[INFO] [Logger] [Record log in C:\Users\Aaron\.kivy\logs\kivy_18-04-02_104.txt]
[INFO] [Kivy] [v1.10.0]
[INFO] [Python] [v3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]]
[INFO] [Factory] [194 symbols loaded]
[INFO] [Image] [Providers: img_tex, img_dds, img_sdl2, img_pil, img_gif (img_ffpyplayer ignored)]
[INFO] [Text] [Provider: sdl2]
[INFO] [OSC] [using <thread> for socket]
[INFO] [Window] [Provider: sdl2]
[INFO] [GL] [Using the "OpenGL" graphics system]
[INFO] [GL] [GLEW initialization succeeded]
[INFO] [GL] [Backend used <glew>]
[INFO] [GL] [OpenGL version <b'4.5.13506 Compatibility Profile Context 23.20.15017.3010'>]
[INFO] [GL] [OpenGL vendor <b'ATI Technologies Inc.'>]
[INFO] [GL] [OpenGL renderer <b'Radeon (TM) RX 480 Graphics'>]
[INFO] [GL] [OpenGL parsed version: 4, 5]
[INFO] [GL] [Shading version <b'4.50'>]
[INFO] [GL] [Texture max size <16384>]
[INFO] [GL] [Texture max units <32>]
[INFO] [Window] [auto add sdl2 input provider]
[INFO] [Window] [virtual keyboard not allowed, single mode, not docked]
[INFO] [VideoGstplayer] [Using Gstreamer 1.10.2.0]
[INFO] [Video] [Provider: gstplayer]
```



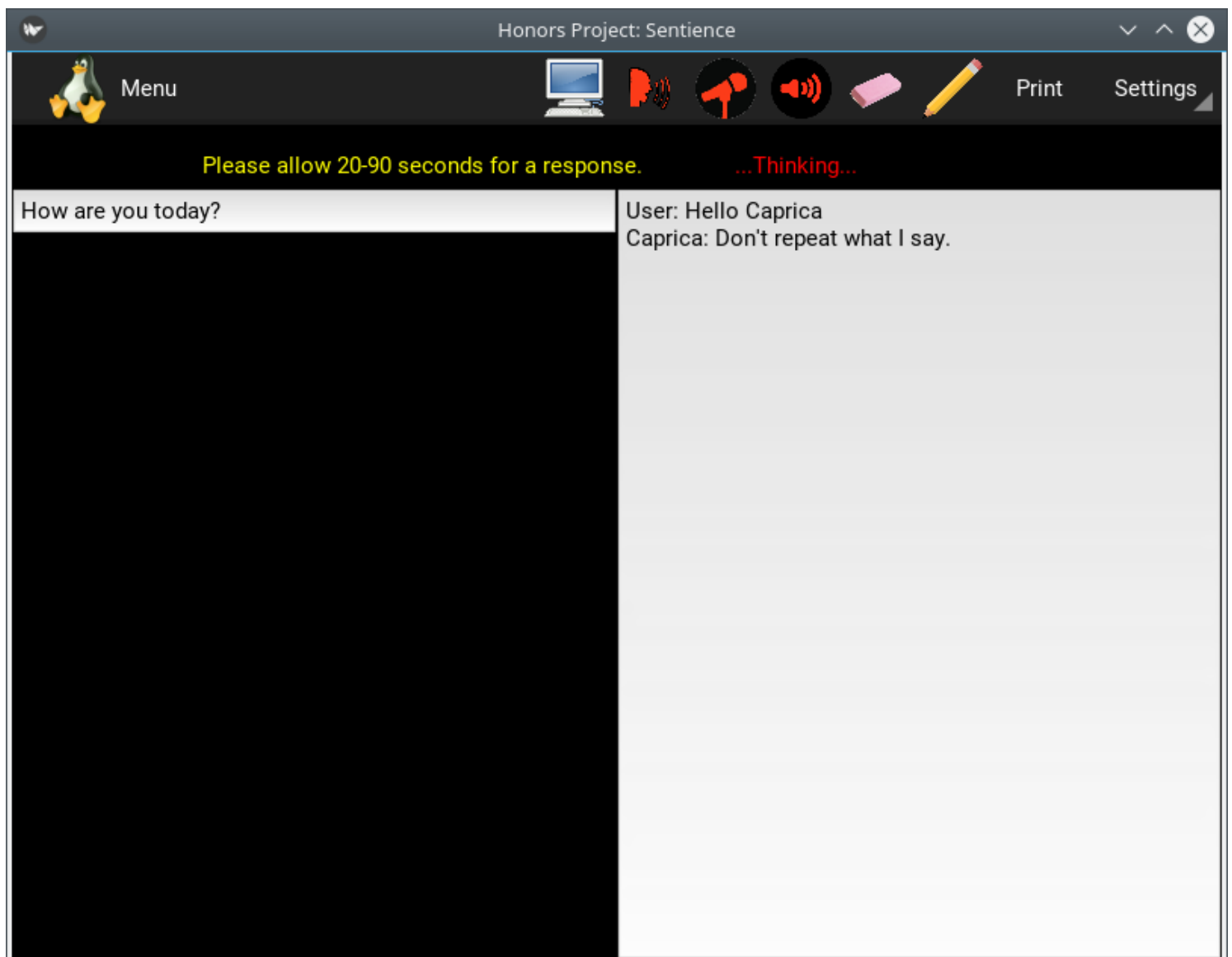
The above image<sup>26</sup> is what the program will look like after you've run it.

If you see the words ‘...Inactive...’ you’re free to interact with the program however you want to. Please see the image<sup>27</sup> below for context.



If you see the text ‘...Thinking...’ please don’t interact with the program. This means that the chatbot is attempting to generate the best possible response for you. Please wait until you see the text ‘...Inactive...’ to start interacting with it again.

Please see the below image<sup>28</sup> for context.



## Linux installation instructions

This installation process is very easy. Open the folder titled

“Installers” and then open the folder titled “linux”. Now go ahead

And open up your terminal that folder and type

“sh install-sentence.sh” follow the prompts on your terminal.

## Windows installation instructions

I've included an installer to make your life easier in the folder named "Installers" > "Windows". There is a file named "Setup.ps1". You can run that program through Microsoft powershell version 3+. The installer will not work on version 2 or 1 of the powershell. You can also install it the required files with the following directions.

1. Install python 3.6.4 <https://www.python.org/downloads/>
2. Unzip the folder swigwin-3.0.12 and move it to "C:\swigwin-3.0.12" <http://www.swig.org/download.html>
3. Install Microsoft Visual Studio 2017 Community Edition <https://www.visualstudio.com/downloads/#build-tools-for-visual-studio-2017>
4. Install sqlite drivers appropriate for your system (32bit and or 64bit drivers) <http://www.ch-werner.de/sqliteodbc/>
5. `python -m pip install --upgrade pip wheel setuptools`
6. `python -m pip install docutils pygments pypiwin32 kivy.deps.sdl2 kivy.deps.glew`
7. `python -m pip install kivy.deps.gstreamer`
8. `python -m pip install kivy.deps.angle`
9. `python -m pip install Cython`
10. `python -m pip install kivy`
11. `python -m pip install kivy_examples`



12. `python -m pip install pandas`
13. `python -m pip install xlwt`
14. `python -m pip install chatterbot`
15. Locate the appropriate Pywin32 installer from the following website <https://github.com/mhammond/pywin32/releases>
16. Add `C:\swigwin-3.0.12` to your environment variables path
17. `python -m pip install chatterbot`
18. `python -m pip install speechrecognition`
19. `python -m pip install pocketsphinx`
20. `python -m pip install pyttsx3`
21. `python -m pip install PyAudio`

If you have power shell version 5 and above then you can skip

All of these steps and use the windows installer located in

\Installers\Windows the file is named Setup.ps1 to run this file

Open your powershell and type

Set-ExecutionPolicy unrestricted

Follow the prompts and then type `./Setup.ps1` to run the insaller.

To find your power shell version type

`$PSVersionTable.PSVersion` and then hit enter on your keyboard.

## Linux File Locations:

### 1. caprica\_Statements.txt:

This is located at /home/user/.SentienceFiles/caprica\_Statements.txt holds all of the response generated by the Chat bot in response to the user.

---

### 2. User\_Statements.txt:

This located at /home/user/.SentienceFiles/ User\_Statements.txt holds all of the responses provided by the user.

---

### 3. Username\_Conversation.txt This file will be named

Username\_Conversation by default if no user profile is ever created. If a user profile is created the Username will reflect the username supplied by the user. It's also stored in /home/user/.SentienceFiles/

---

These files can all be manipulated to provide further training for the Chat bot, or simply to maintain for your records and later research.

I will list each file path in full again if you desire to print them.

/home/user/.SentienceFiles/Caprica\_Statements.txt

/home/user/.SentienceFiles/User\_Statements.txt

/home/user/.SentienceFiles/Username\_Conversation.txt

---

## Windows File Locations

### 1. caprica\_Statements.txt:

This is located at C:\SentienceFiles\  
caprica\_Statements.txt holds all of the response generated by the  
Chat bot in response to the user.

---

### 2. User\_Statements.txt:

This located at C:\SentienceFiles\ User\_Statements.txt holds all of  
the responses provided by the user.

---

### 3. Username\_Conversation.txt This file will be named

Username\_Conversation by default if no user profile is ever  
created. If a user profile is created the Username will reflect the  
username supplied by the user. It's also stored in C:\SentienceFiles\  
Username\_Conversation.txt

---

These files can all be manipulated to provide further training for the  
Chat bot, or simply to maintain for your records and later research.

I will list each file path in full again if you desire to print them.

C:\SentienceFiles\Caprica\_Statements.txt

C:\SentienceFiles\User\_Statements.txt

C:\SentienceFiles\Username\_Conversation.txt

---

There is also a form of documentation for programmers. This documentation is located in the folder labeled "Documentation". A Variety of different types of docs were created. The easiest options to read (for readability) would be the html files which are located in the folder labeled "html". You can access them by opening the file "index.html". The second easier option is the .pdf which is located in the folder labeled "Latex" and is named refman.pdf