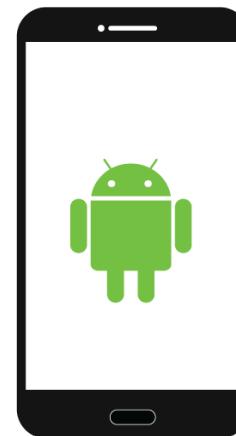
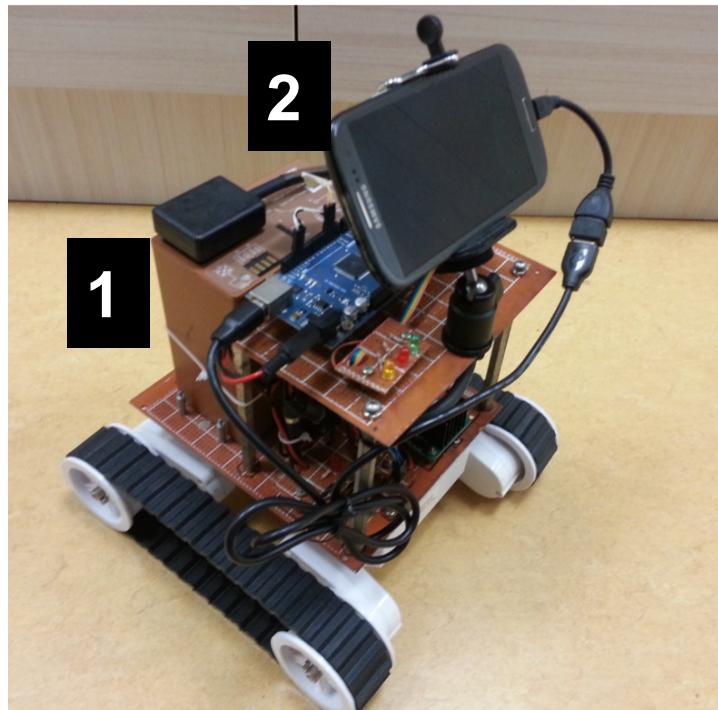


Design and Implementation of Portable, Social Robot using Android with Speech Recognition and Text to Speech

Brian Rhindress (Undergraduate Univ. Pittsburgh, ECE)
Mentor: Tu Fangwen

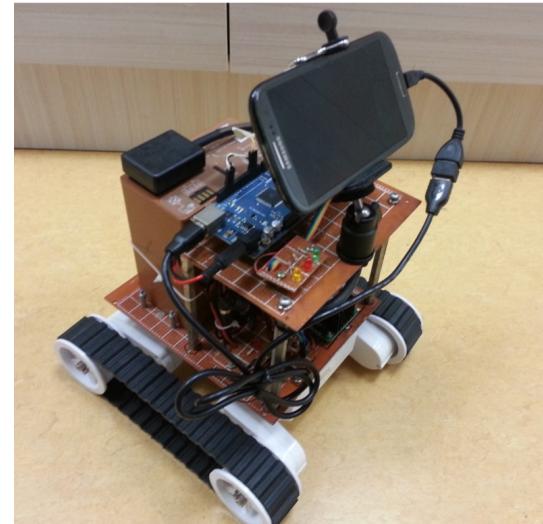
What I came in with

1. Robot hardware
2. Robot hardware-android interface software
3. Android-android networking protocol established



Social Robot Demonstration

4...?



Design considerations

- Artificial Intelligence with ability to talk to people

Design considerations

- Artificial Intelligence with ability to talk to people
- Emotional detection + response

Design considerations

- Artificial Intelligence with ability to talk to people
- Emotional detection + response
- Memory of past interaction

Design considerations

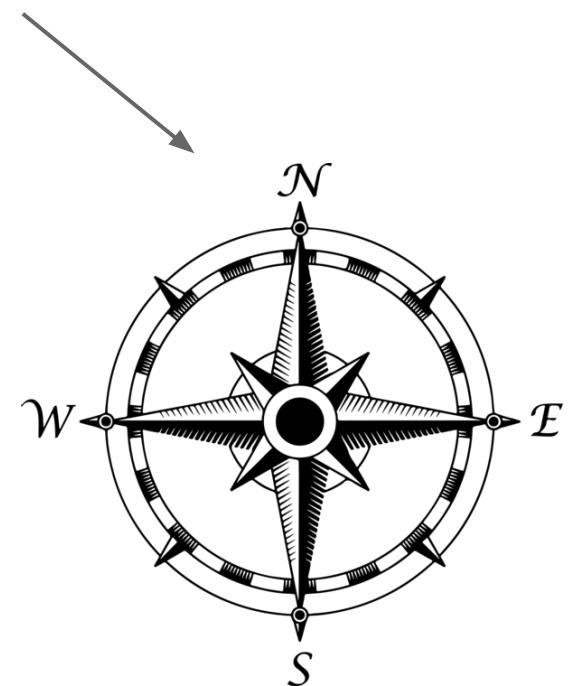
- Artificial Intelligence with ability to talk to people
- Emotional detection + response
- Memory of past interaction
- Improved voice-activated navigation

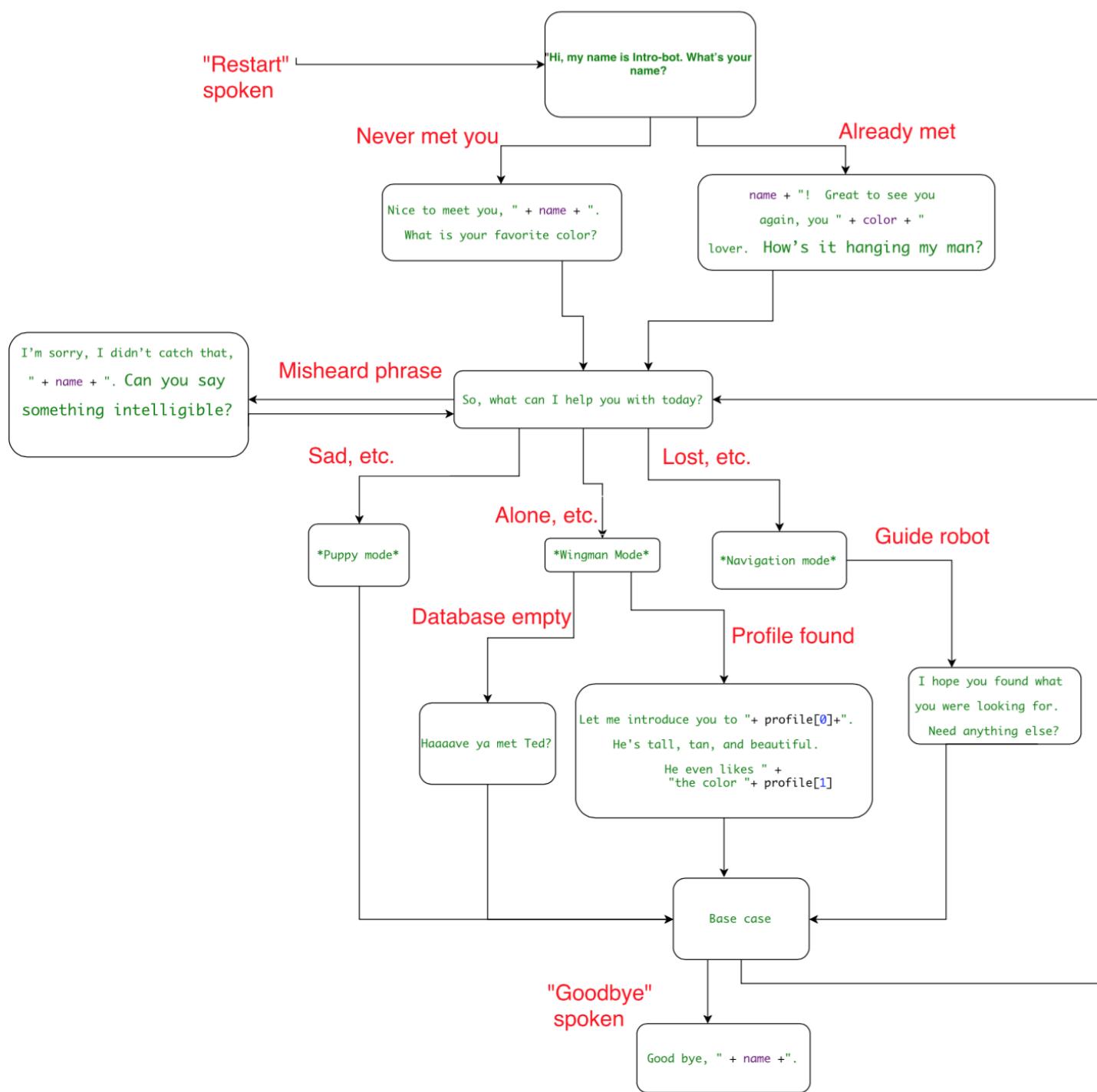
Design considerations

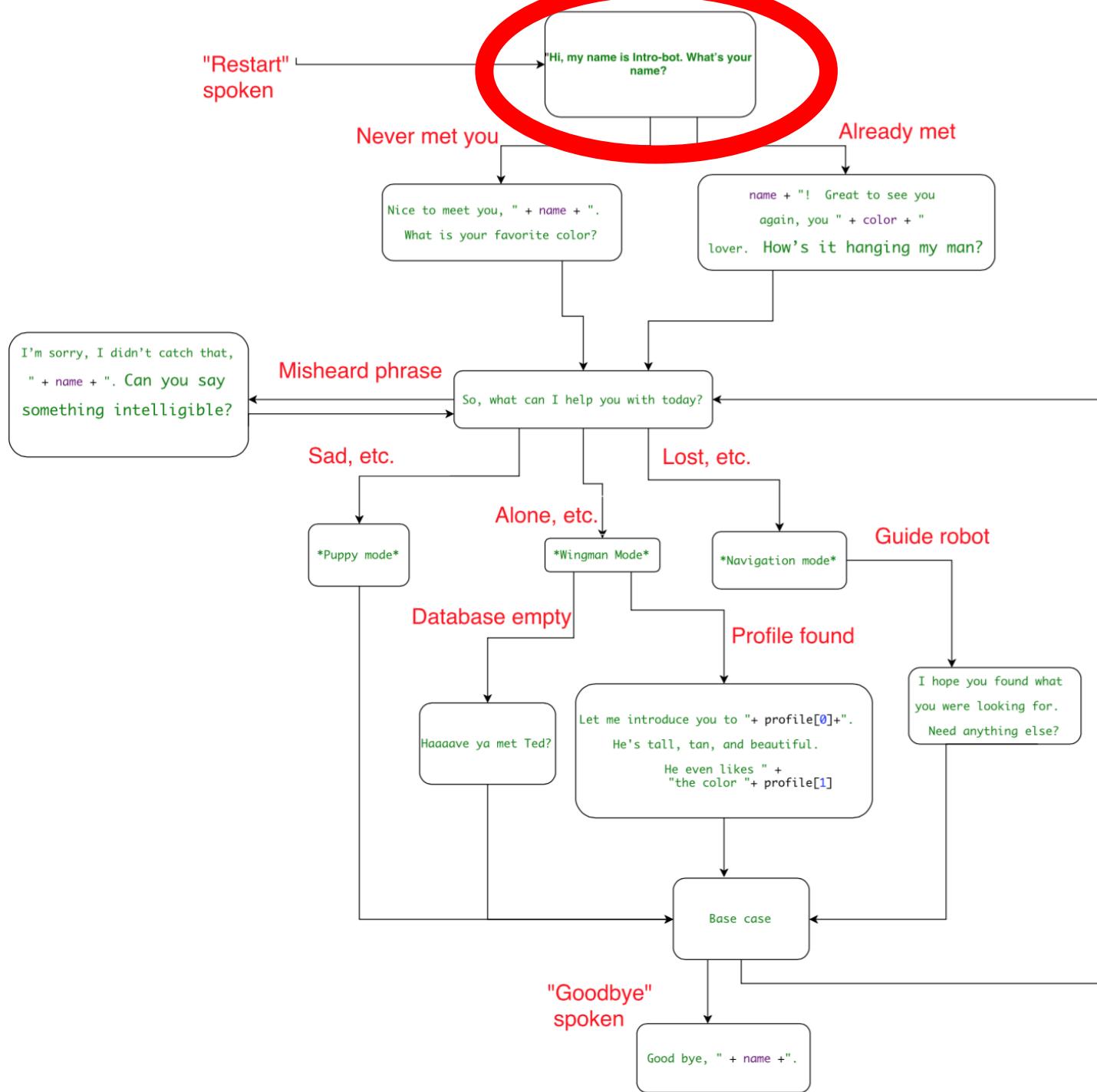
- Artificial Intelligence with ability to talk to people
- Emotional detection + response
- Memory of past interaction
- Improved voice-activated navigation
- Modular development for future features

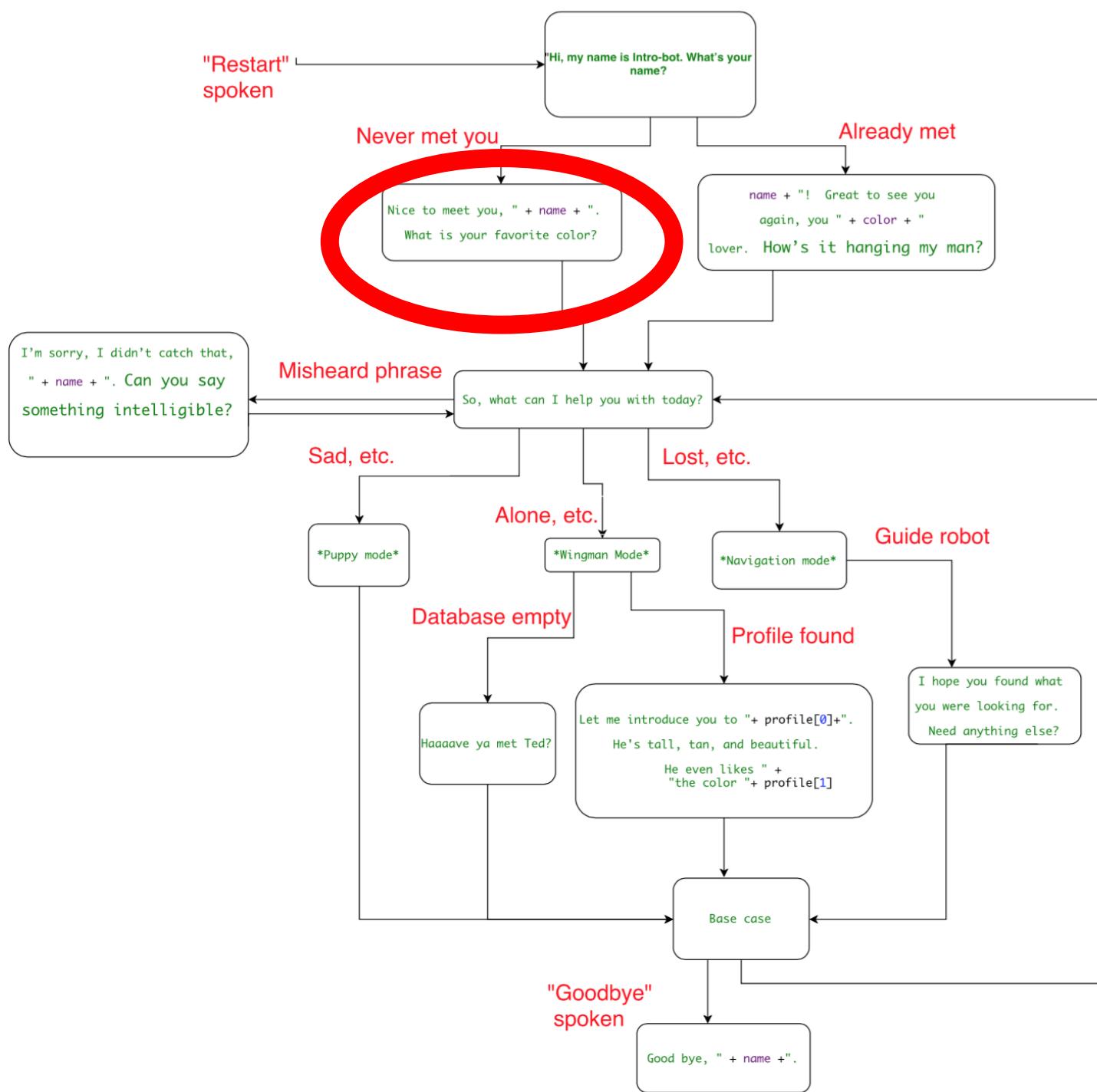
Use cases

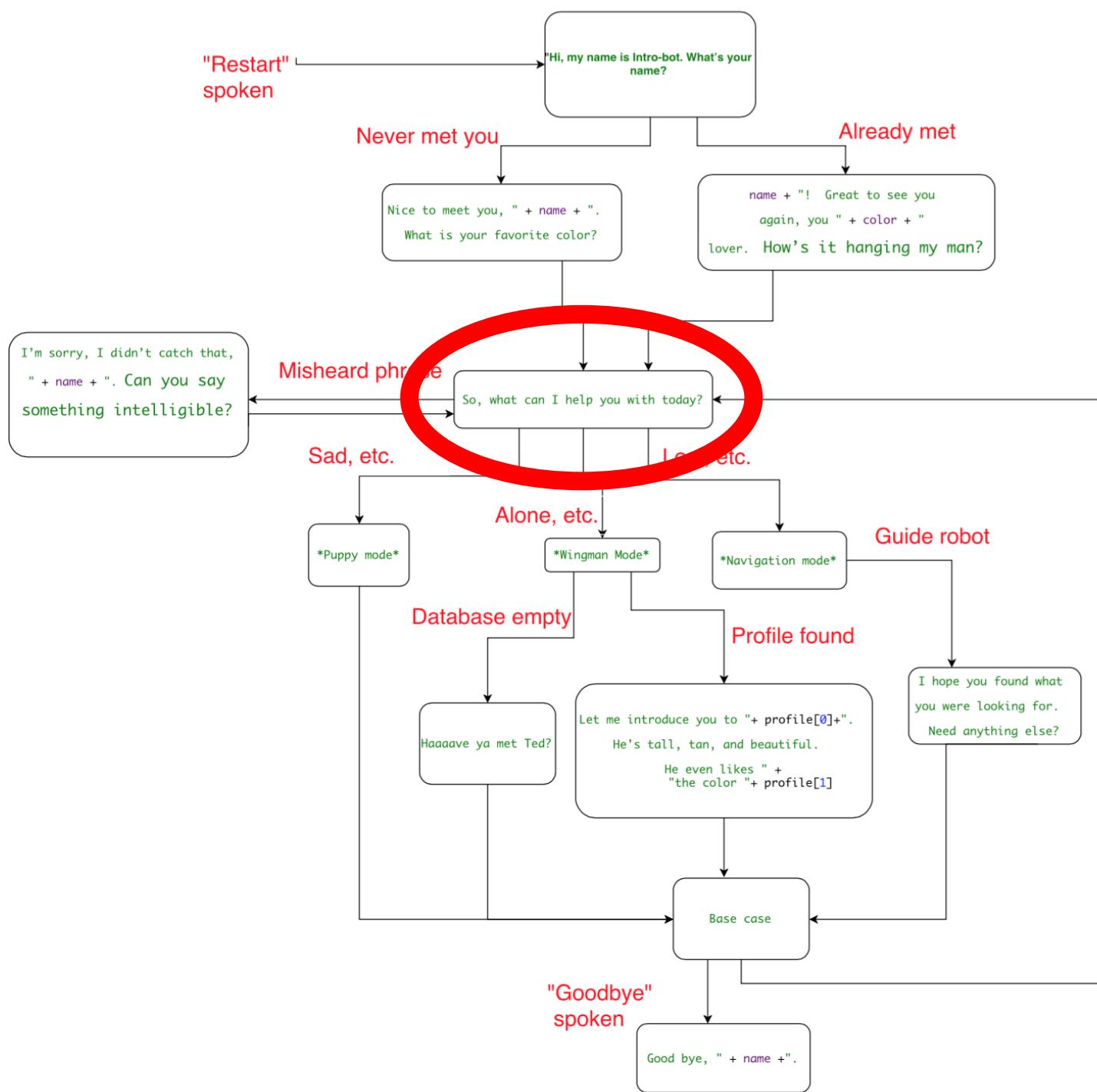
introduce yourself
robot remembers you?
tell the robot how you feel: it **responds**

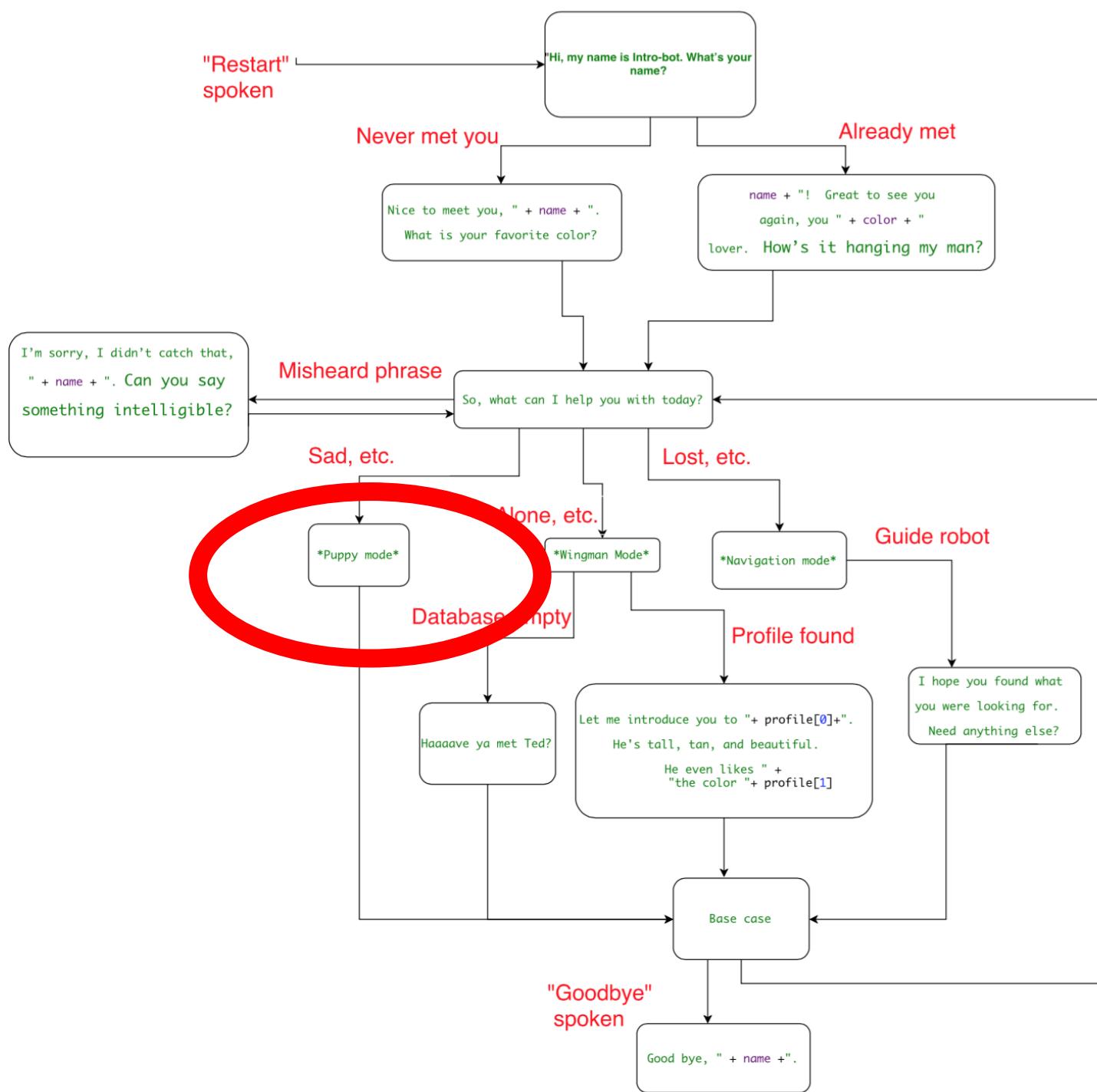


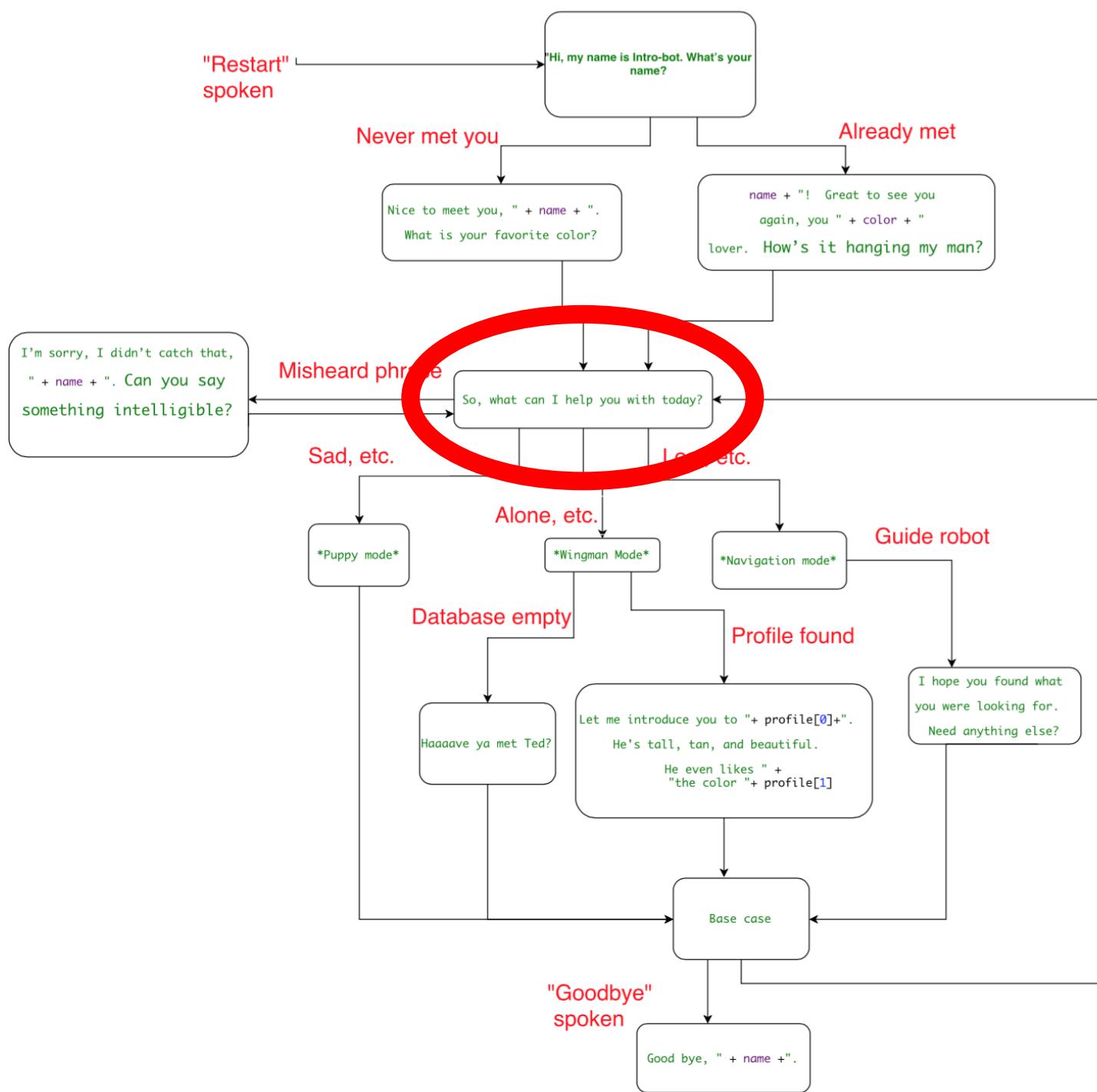


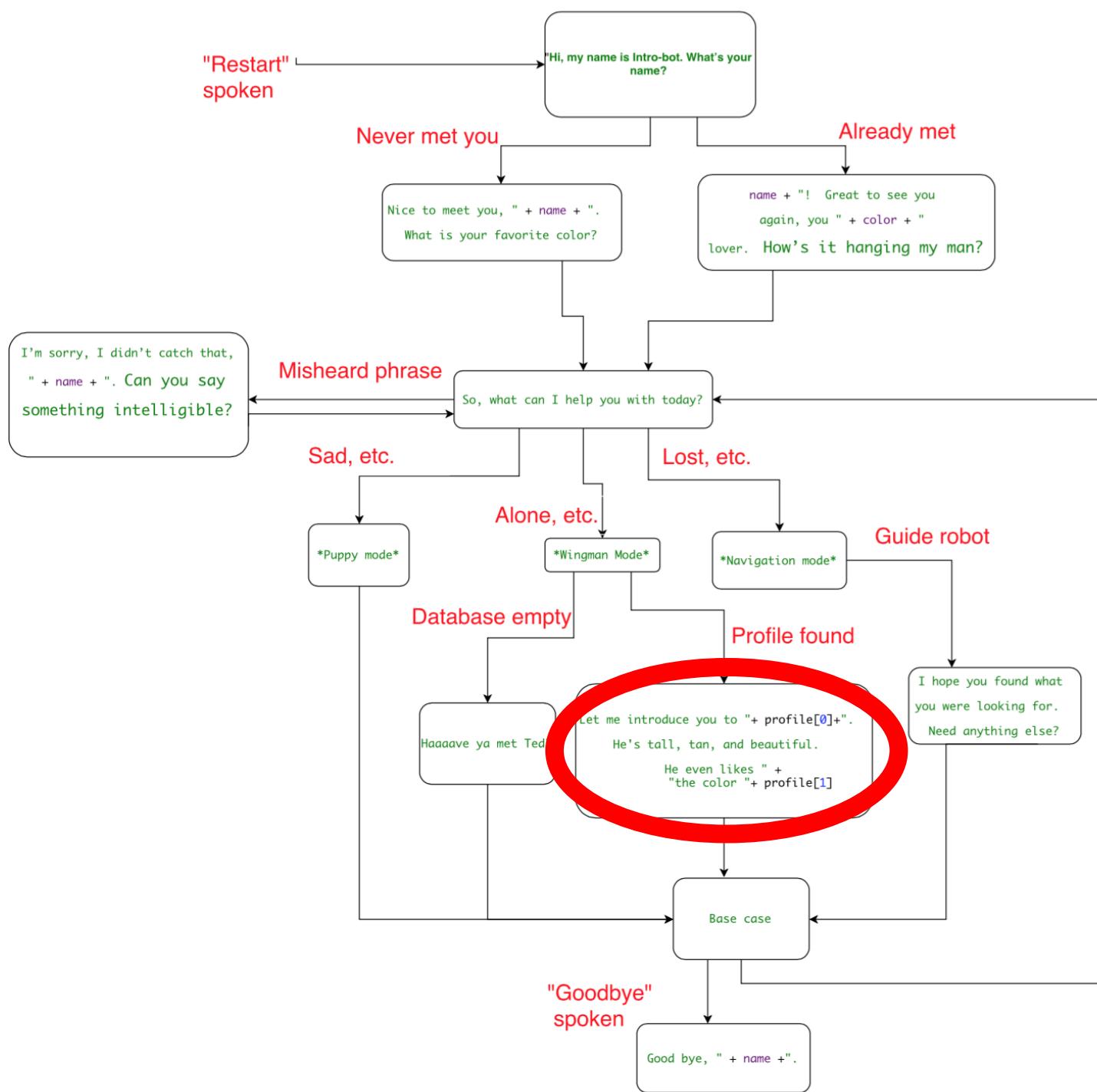


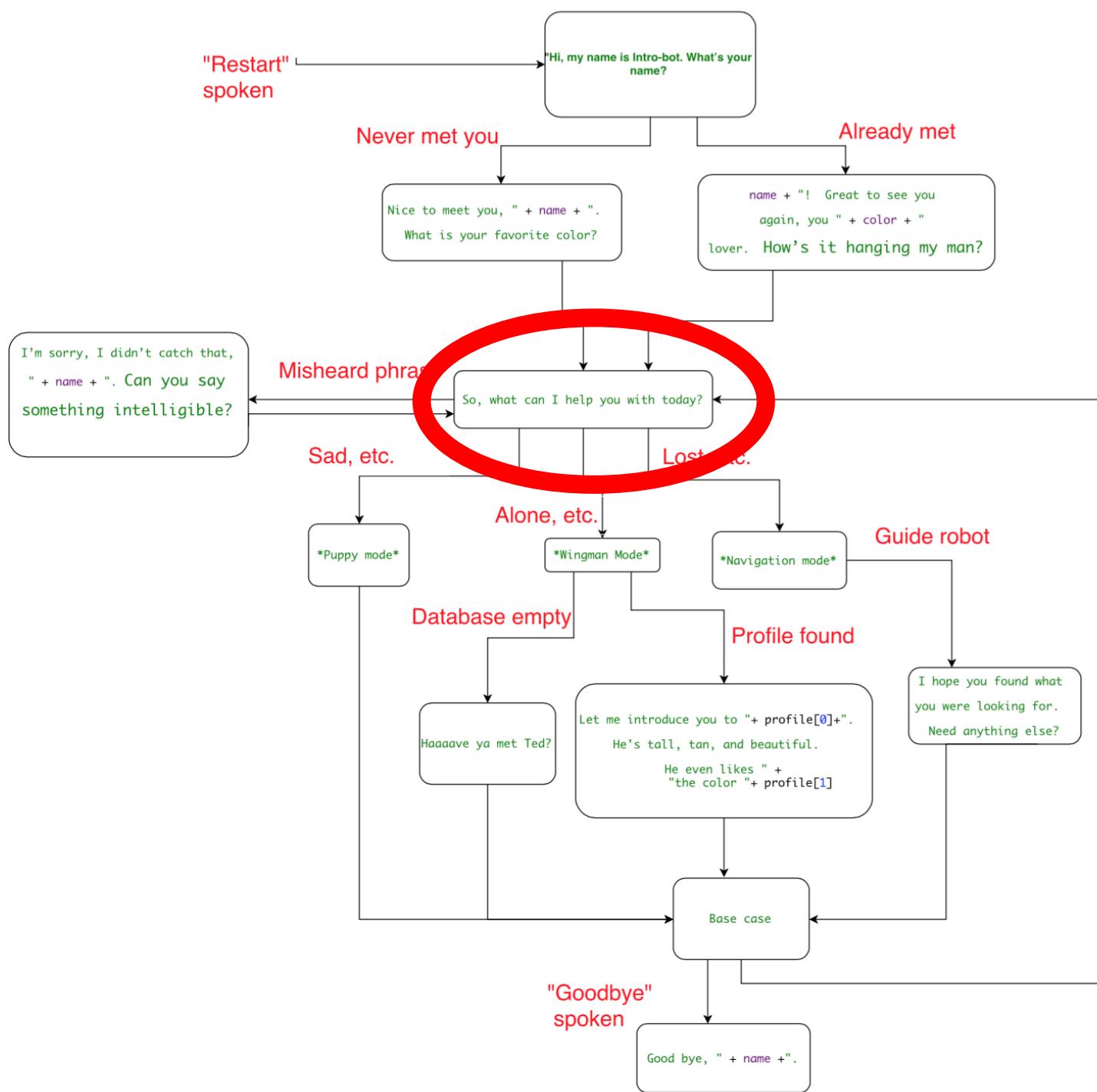


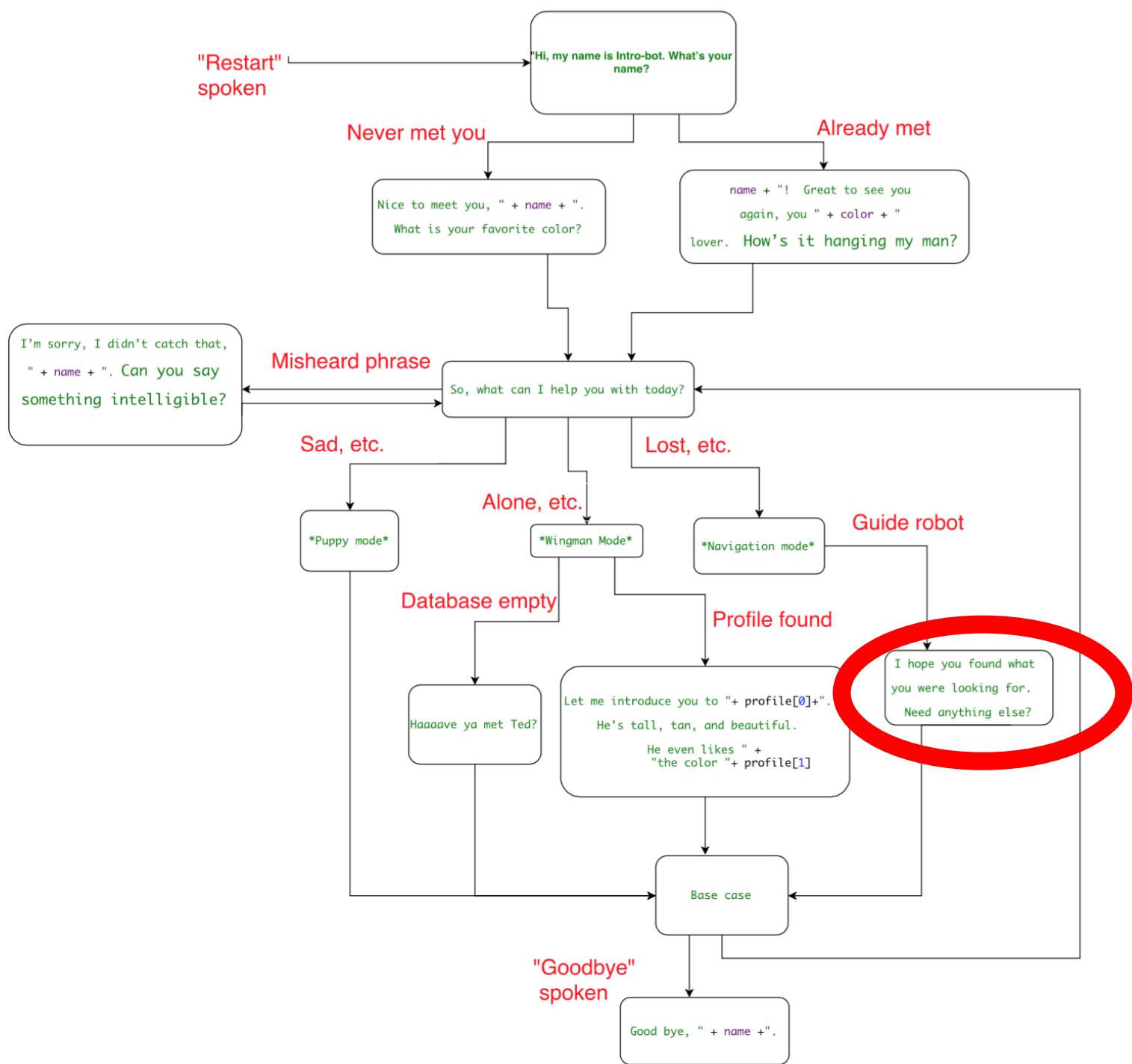


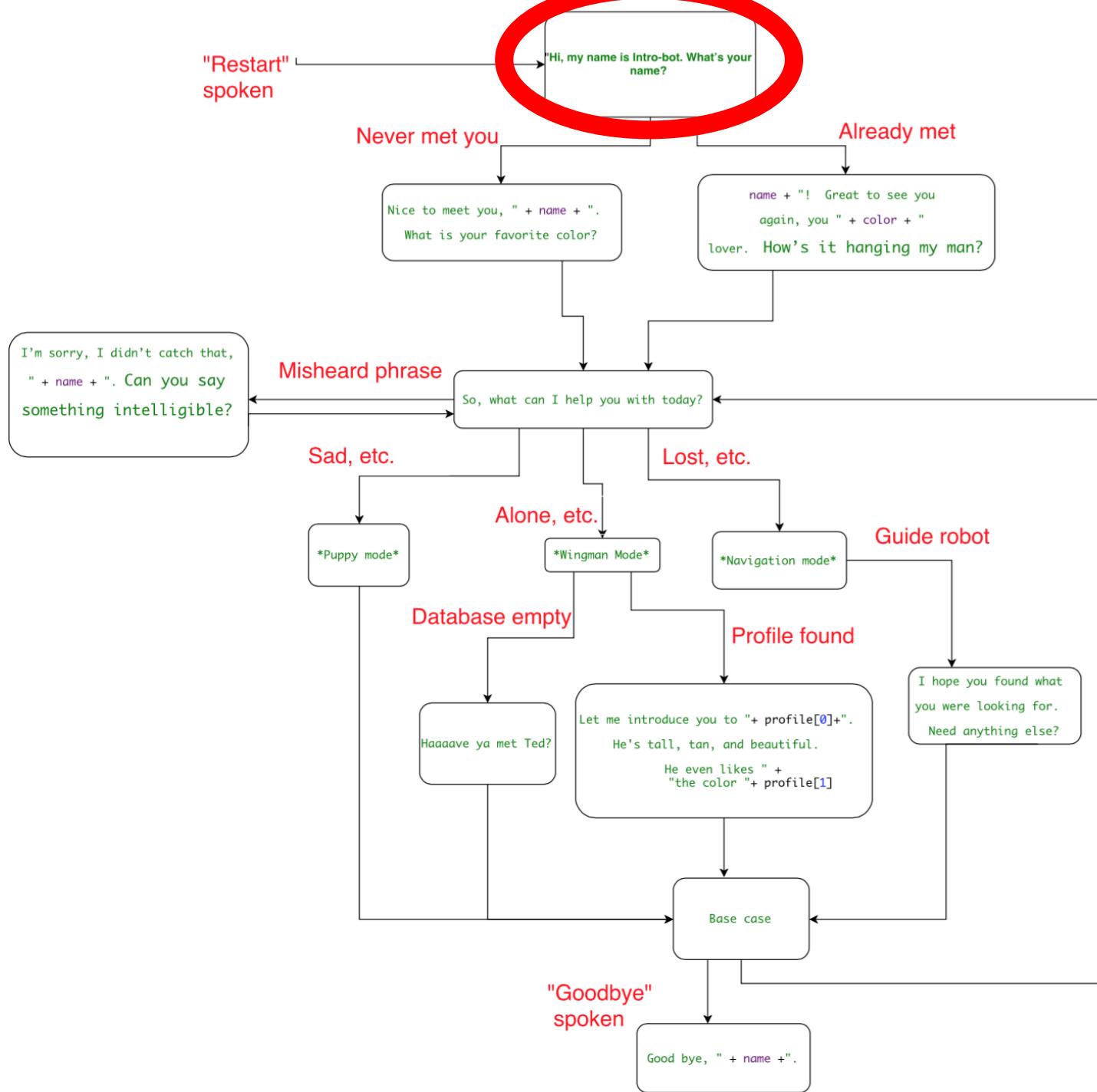




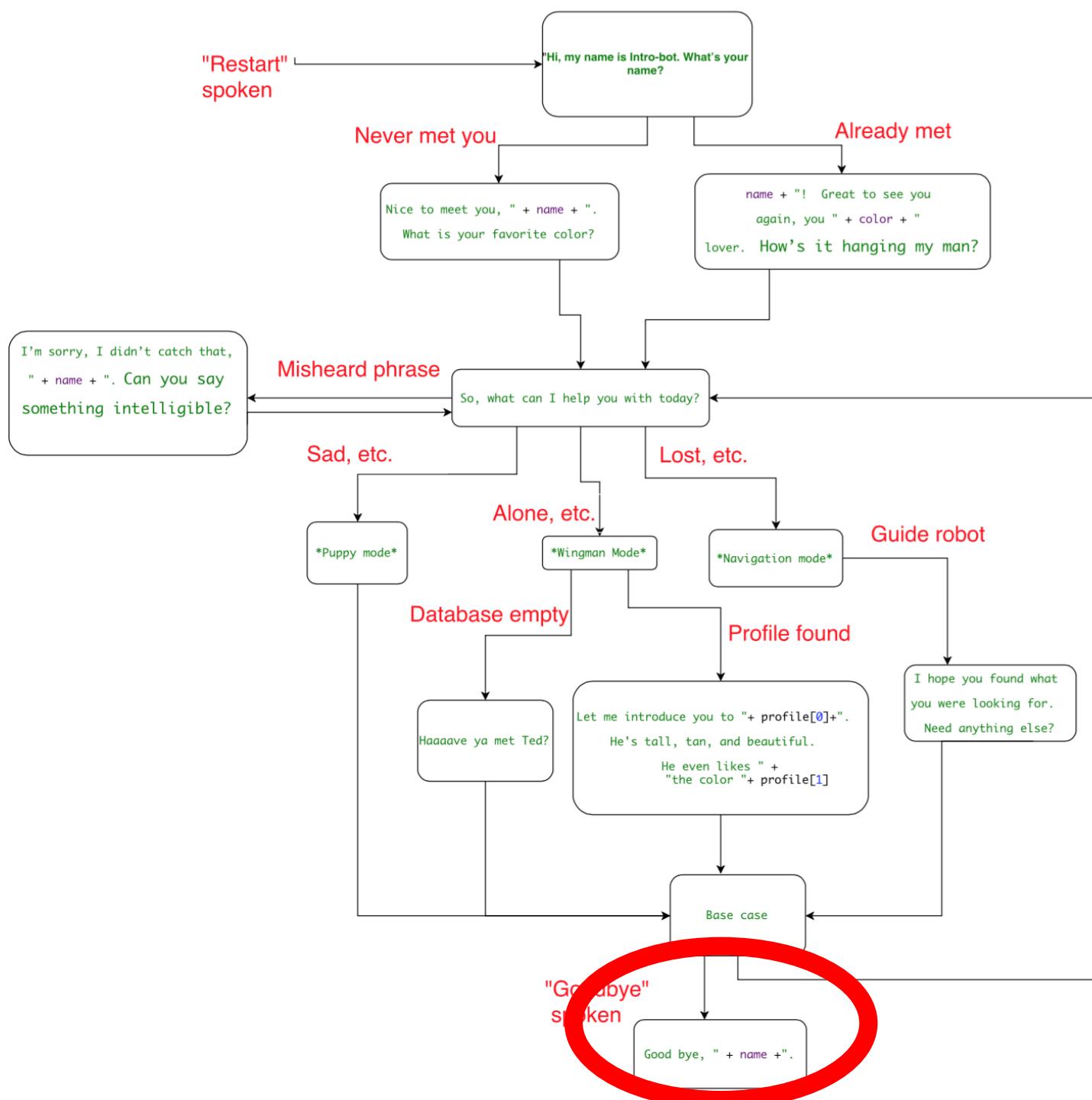












Needed Improvements

- Limited corpus → unsophisticated language model
- Microphone quality dependency with device
- Better segregation between client and server

Future work

- Autonomous Driving: fit with sensors
- API/Library so other lab members can program easily
- USE FOR PROTOTYPING!

References

Chang, Poo Hee. "A Mobile Robot Platform Empowered with Android Smartphones." (2015). Print.

<http://android-developers.blogspot.sg/2009/09/introduction-to-text-to-speech-in.html>

<http://cmusphinx.sourceforge.net/wiki/tutorial>

<http://developer.android.com/develop/index.html>

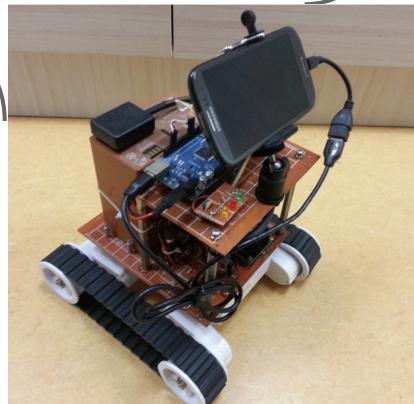
http://tutorialspoint.com/android/android_text_to_speech.htm

Collaboration



Scaled voice control
(Dongwei)

← LEFT! ← left



Navigation mode (Brian)

Location found!



Object detection (Taiming)

