CS 466/566 – Voice Assistants Final Project - Winter 2024

Name: Mounika Javvaji

❑ Step 1 - Describe the Application

Voice Assistant name: Sifra

I'm embarking on the creation of an application called FitFocus aiming to revolutionize the landscape of exercise and fitness management for individuals. With FitFocus, users can seamlessly oversee their fitness-related tasks such as workout routines, progress tracking, community engagement, and access to fitness services. The application empowers users to effortlessly handle various aspects of their fitness journey, including setting workout goals, monitoring progress, scheduling workout sessions, and connecting with fitness professionals.

One of the standout features of FitFocus is its ability to promptly and easily arrange additional fitness services, such as personalized workout plans, virtual training sessions, and access to specialized fitness classes. Users no longer need to juggle multiple platforms or struggle with finding the right resources. With FitFocus, everything they need to enhance their fitness journey is conveniently accessible in one user-friendly interface.

Overall, I believe that FitFocus will significantly elevate individuals' fitness journeys by providing them with a comprehensive and intuitive platform that simplifies the pursuit of a healthier and fitter lifestyle.

❑ Step 2 - Interaction Model

FitFocus is designed to provide a seamless and user-friendly chat experience for individuals seeking fitness and wellness support. It encompasses various functionalities such as setting exercise goals, determining workout intensity levels, and calculating calorie expenditure.

FitFocus interacts with users in a natural and supportive manner, offering tailored recommendations and options based on their preferences and requirements. As users engage more with the application, FitFocus learns and adapts to provide increasingly personalized advice and assistance, enhancing the overall user experience.

❑ **INTENTS:**

1) **Intent Name: “ExerciseIntent”:**

   Description: The "ExerciseIntent" allows users to discover specific exercises by type and obtain detailed instructions. Users can specify the type of exercise they're interested in, such as cardio, strength training, or yoga, and receive guidance on how to perform the chosen exercise effectively within a concise interaction.

2) **Intent Name: “Difficulty_Level”:**

   Description: The "Difficulty_Level" intent in FitFocus allows users to specify their fitness proficiency levels (beginner, intermediate, expert). Based on this input, the virtual assistant recommends suitable exercise routines tailored to the user's capabilities, ensuring effective and personalized workout experiences.

3) **Intent Name: “CalorieBurnCalculation”:**

   Description: The "CalorieBurnCalculation" intent computes calories burned for a specified exercise based on user-input parameters: exercise duration, weight, and exercise type. FitFocus provides accurate estimates to aid users in managing their fitness goals effectively, facilitating informed decision-making within a streamlined user experience.

❑ Training phrases:

Training phrases for “ExerciseIntent” Intent:

1) **What is the best exercise for neck pain? Could you provide some instructions?**
2) **Are there any specific stretches for relieving neck tension?**

3) What exercises can I do to alleviate neck pain, I need instructions on how to engage in a workout?
4) What's a good exercise routine for chest?
5) What are some exercises for strengthening my glutes, please give me instructions to do exercise?
6) What are some effective exercises for toning my forearms?
7) Can you recommend exercises to alleviate lower_back pain and strengthen the core?
8) What's the best way to tone and define my triceps?
9) What are some effective exercises for strengthening my quadriceps?
10) What's the best way to build muscle mass in my chest?
11) How can I increase flexibility in my hamstrings?
12) What are some exercises to target my lower_back muscles, Can you offer instructions for exercising?
13) How do I develop stronger biceps without using weights?
14) Can you suggest a workout routine to get triceps?
15) How can I strengthen my abdominals

Training phrases for "Difficulty_Level" Intent:

1) As an expert athlete, what should my approach be towards periodization and training cycles?
2) I've reached an expert level in weightlifting, what advanced training methods can I implement for continued progress?
3) What are some expert level interval training protocols for optimizing performance?
4) What are some expert techniques for enhancing flexibility beyond basic stretching?

5) What expert level exercises would you recommend for someone looking to push their fitness limits?

6) I'm looking to step up my core workout, what are some intermediate-level exercises I can try?

7) Are there any specific exercises for intermediate runners to improve speed and endurance?

8) How can I transition from basic cardio to more intense workouts at an intermediate level?

9) I've progressed from beginner workouts, what are some intermediate-level strength training exercises?

10) What are some challenging but achievable exercises for someone at an intermediate fitness level?

11) What are some beginner-level exercises I can do to strengthen my core?

12) How can I start incorporating exercise into my daily routine as a beginner?

13) What are some basic workouts for beginner to improve flexibility?

14) I'm new to fitness, could you recommend beginner -friendly cardio exercises?

15) I have limited time for workouts. Can you recommend some beginner level but effective exercises?

Training phrases for "CalorieBurnCalculation" Intent:

1) Tell me the calories burnt during a 60 min running weighing 65 kilograms

2) What's the calorie burn for kickboxing for 40 minutes, with a weight of 80 kilograms?

3) Estimate the calorie expenditure for running for 35 minutes, with a weight of 75 kilograms.

4) I want to know the calories burnt for dancing for 90 minutes , weighing 62 kilograms.

5) Calculate the calorie burn for 45 minutes of circuit training, weighing 70 kilograms.

6) How many calories do I burn doing jumping jacks for 15 minutes, weighing 63 kilograms?

7) Estimate the calorie expenditure for hiking for 160 minutes, with a weight of 68 kilograms.

8) Calculate the calories burned during yoga for 45 minutes, weighing 55 kilograms.

9) What's the calorie burn for playing basketball for 50 minutes, with a weight of 72 kilograms?

10) Estimate the calories burnt for weightlifting for 40 minutes, weighing 85 kilograms.

11) I want to know the calorie burn for walking for 60 hour, weighing 60 kilograms

12) Calculate calories burned during a 20minute Walking session, with a weight of 75 kilograms.

13) **Estimate the calorie expenditure for swimming for 45 minutes, with a weight of 80 kilograms.**

14) **Calculate the calorie burn for cycling for 30 minutes at 10 km/h, weighing 70 kilograms.**

15) **How many calories do I burn running for an 60 hour at a moderate pace, weighing 65 kilograms?**

❑ Parameters and Entities:

- **Intent Name: "ExerciseIntent"**

  Parameters and their Entities:

  1. Instructions: Provides clear and concise guidance or directives for carrying out a particular task or activity, ensuring efficiency and effectiveness in execution.

  2. Exercise Part: Denotes a specific segment or component of a workout regimen or physical activity routine, designed to target particular muscle groups or achieve specific fitness goals through systematic engagement and repetition.

- **Intent Name: "Difficulty_Level"**

  Parameters and their Entities:

  1. Levels: The entity "levels" refers to the different levels of difficulty that can be assigned to tasks, such as Beginner, Intermediate and Expect levels. This intent helps to categorize tasks based on their complexity, aiding in appropriate resource allocation or user experience customization.

- **Intent Name: "CalorieBurnCalculation"**

  Parameters and their Entities:

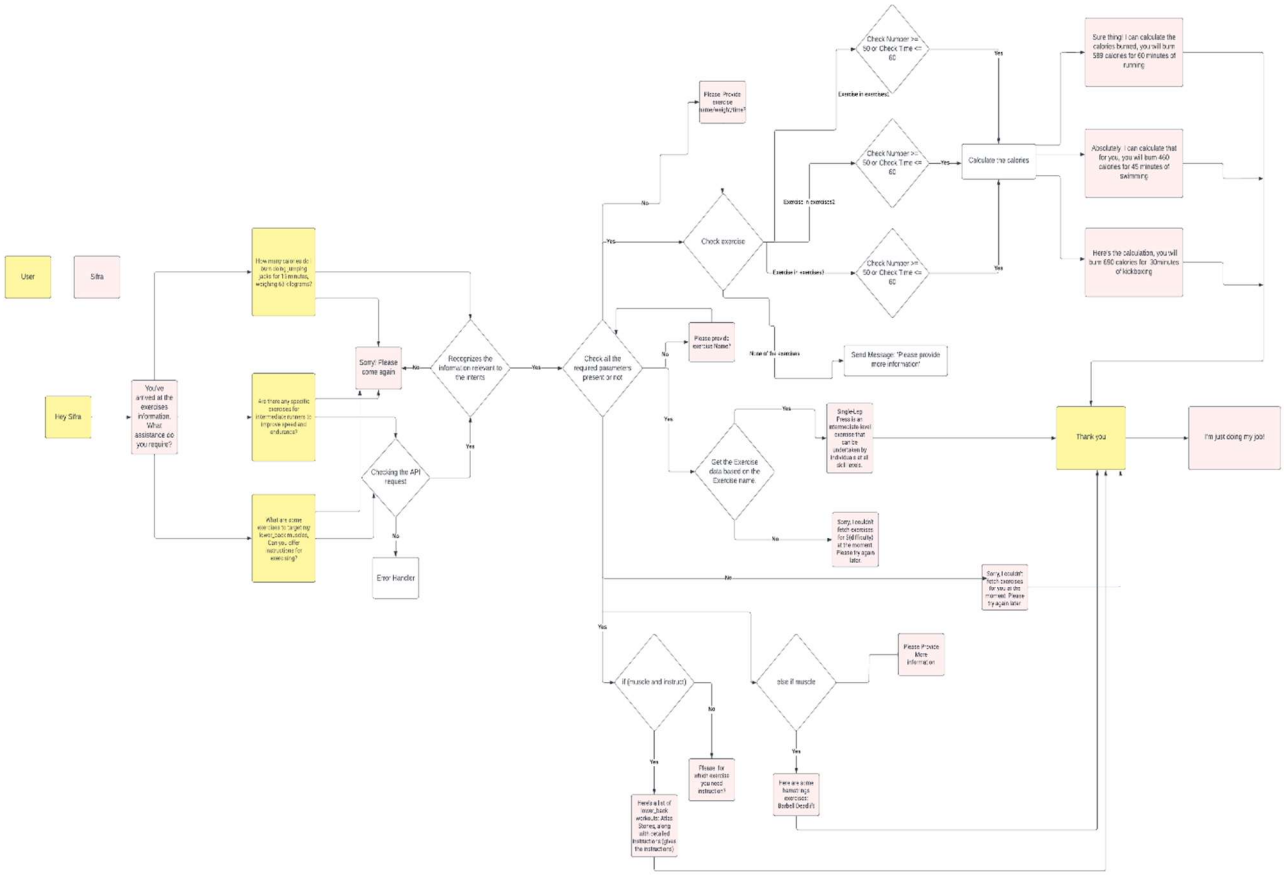
  1. Time: This entity refers to the duration of the exercise session or activity, typically measured in minutes or hours. It is essential for calculating the total calorie burn as it determines the length of time during which physical activity occurs.

  2. Exercise Name: This entity specifies the type of exercise or physical activity being

performed, such as jogging, swimming, weightlifting, or cycling. Different activities have varying intensities and metabolic demands, affecting the rate at which calories are burned.

3. Weight: This entity represents the body weight of the individual engaging in the exercise. Weight plays a crucial role in determining the amount of energy expended during physical activity, as heavier individuals generally burn more calories than lighter individuals due to the increased effort required to move their bodies.

❑ Step 3 - Conversational Flow Diagram



❑ Step 4 - Fulfillment

Intent: “ExerciseIntent”

Logic:

Step1: It extracts user input parameters regarding the muscle group and whether the user wants instructions.

Step2: Constructs an API URL with the muscle parameter to fetch exercise data.

Step3: Fetches exercise data from the API.

Step4: Parses the response to extract exercise names and instructions.

Step5: Generates response messages with exercise suggestions and instructions.

Step6: Selects a random response message from the list.

Step7: Constructs the final response text based on user input and fetched data.

Step8: Sends the response back to the agent (chatbot) for delivery to the user.

Step9: Handles errors gracefully if there are any issues fetching exercise data from the API.

Intent: “ExerciseIntent”

Logic:

Step1: Receive the difficulty level parameter from the agent.

Step2: Construct the API URL using the received difficulty level parameter.

Step3: Make an HTTP GET request to the constructed API URL.

Step4: Handle the response from the API:

a. If the request is successful:

i. Extract the name of the exercise from the response data.

ii. Generate three different reply options containing the exercise name and difficulty level.

iii. Select one reply randomly from the generated options. iv. Add the selected reply to the response.

b. If the request fails:

i. Log the error to the console.

ii. Add a message indicating that exercises couldn't be fetched for the specified difficulty level at the moment.

Step5: Return the response to the agent.

Intent: “CalorieBurnCalculation”

Logic:

Step1: Define an array randomPhrases containing random phrases to be used as responses.
Step2: Define three arrays exercises1, exercises2, and exercises3, each containing different types of exercises.
Step3: Define an array array containing metabolic equivalent of tasks (MET) values for different activities.
Step4: Define the function CalorieBurnCalculationintent(agent) which takes an agent object as a parameter.
Step5: Inside the function:

a.Generate a random phrase from randomPhrases.
b. Generate a random MET value from array.
c. Extract parameters exercisename, number, and time from the agent's parameters.
d. Calculate the calories burned using the formula: calories = Math.floor(met * number * (time / 60)).
e. Initialize an empty string agentMessage.
f. Check conditions for determining the message:

- If exercisename is in exercises1 or if number is greater than or equal to 50 or if time is less than or equal to 60, set agentMessage accordingly.
- Otherwise, if exercisename is in exercises2 or if number is less than or equal to 50 or if time is greater than or equal to 60, set agentMessage accordingly.

- Otherwise, if exercisename is in exercises3 and number is greater than or equal to 50 and time is less than or equal to 60, set agentMessage accordingly.
- Otherwise, if exercisename is in exercises3 and number is less than or equal to 50 and time is greater than or equal to 60, set agentMessage accordingly.
- If none of the above conditions are met, set agentMessage to "Please provide more information". g. Add agentMessage to the agent's response.

Step6: End of function.

❑ Step 5 - User Testing

❑ In this step, you will be testing the application with users. As such, you will need to find **2 people** to test your application and you will have to put together three types of tests.

❑ **Part 1 - Usability Testing:** Create a list of **5 tasks** for a potential user to complete. Ask the person testing your application to complete each task. Keep track of whether they were able to complete the task, and if so, how long it took.

Task	**Time to Complete**	**User 1 - Done?**	**User 1 - Time**	**User 2- Done?**	**User 2 - TIme**
Task 1- Calculate the calorie burn for 45 minutes of circuit traning, weighing 70 kgs.	50 sec	Yes	35 sec	yes	45 sec
Task 2 Tell me the calories burnt during a 60 min running	55 sec	yes	40 sec	Yes	35 sec

weighing 65 kilograms					
Task 3 Are they any specific stretches for relieving tension?	45 sec	yes	40 sec	yes	38 sec
Task 4 What are some effective exercises for toning my forearms?	60 sec	yes	55 sec	yes	50 sec
Task 5 what are some beginner level exercises I can do to strengthen my core?	40 sec	yes	33 sec	yes	35 sec

Part 2 - Likert Scale Testing: Come up with **10 questions** to ask using the Likert Scale. See the sample questionnaire in the User Testing lecture slides.

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
How well did the FitFocus Agent understand your needs and requirements?					Yes
How likely are you to recommend the FitFocus service to others?				Yes	

How satisfied are you with the variety of exercises available on FitFocus?			Yes		
To what extent does FitFocus help you track your fitness progress effectively?				Yes	
How motivating does you find the features provided by FitFocus to stick to your fitness routine?			Yes		
How likely are you to continue using FitFocus in the future?					Yes
To what extent does FitFocus help you set and achieve your fitness goals?				Yes	
How satisfied are you with the performance speed and responsiveness of the FitFocus?				Yes	
How satisfied are you with the accuracy of the progress tracking features in FitFocus?			Yes		
Overall, how satisfied are you with your experience using FitFocus?					Yes

❑ **Part 3 - Open-ended questions:**

1. **What enhancements or additional capabilities would you like to see incorporated into the FitFocus virtual assistant in the future?**

   It would be beneficial if the assistant could provide insights on how different exercises contribute to overall fitness goals and suggest variations or modifications based on past user preferences and performance.

2. **Did you encounter any aspects of the FitFocus virtual assistant that were perplexing or challenging to utilize?**

   I found the prompts to be somewhat repetitive, especially when specifying exercise types and difficulty levels. It wasn't always clear how the assistant utilized the information provided to tailor exercise recommendations effectively, particularly in terms of adjusting difficulty levels or suggesting suitable modifications for different proficiency levels.

3. **Is there any further feedback you'd like to provide regarding your experience with the FitFocus virtual assistant?**

   I believe there is potential to further streamline the user experience by providing clearer instructions and explanations on how to optimize workouts based on individual fitness levels and goals.

❑ **Step 6 - Review and Reflection**

❑ **General Impressions**:

I have mixed feelings about this assignment. I liked using Dialogflow instead of Alexa skills because it's easier to use and has a nice interface. Testing the application was simple too. But I had trouble writing the code in the console and moving between different parts of it. Also, deploying the Dialogflow agent took a lot of time, which was frustrating.

If I could change something, I would make the questions easier to understand, especially for students. In this assignment, I struggled with the questions in step 2 about creating the slots because they were unclear.

Overall, despite the challenges with development and deployment, I think using Dialogflow was a good decision for this assignment, and I'm happy with how it turned out.

❑ **Time:**

Regarding this assignment, I can say that it demanded considerable time and effort on my part. I dedicated approximately five days to the project, with one entire day devoted to designing the conversational flow diagram and fulfillment although this step took me a long time to complete. Another day was spent on testing the application to ensure that all functionalities were working correctly. Additionally, another day was allocated to

understanding APIs as I lacked sufficient knowledge about them. However, going through each API's working process was very helpful for me and will be beneficial in the future. The hardest and most time-consuming part of the assignment was making sure the fulfillment worked properly. It was tough and needed a lot of work and time. Testing it also took a while because I had to check if everything was working right. Fixing any mistakes or problems with it also took a long time because I had to keep looking at the cloud console many times.

- **Testing:**

  When I was making my Dialogflow agent "FitFocus," I did usability testing to make sure it was easy to use. But I found out that having real users test it was even more important. They gave me great insights into what they needed and any problems they had. I tested all the ways people might talk to my agent to catch any issues early on. This helped me fix problems quickly. User testing helped me understand what users expected and how they used the agent. This let me make it better for them.

  User testing also showed me what features users wanted. I listened to their feedback and added these features to make the agent even better. The feedback from users helped me feel confident that my agent worked well for them.

  If I had more time, I'd keep testing and adding features based on what users say. This way, the agent would keep getting better and better, meeting users' needs.In short, testing with users was crucial for making my Dialogflow agent "FitFocus" a success. It helped me understand what users wanted and how they used the agent, making it more user-friendly.

- **Future Work**:

  Testing is an important part of making sure a program works well for its users. Even though I did a lot of testing to see how people use the program and how they like it, there's always room to make it even better. I want to try out new ways of testing to learn more about how people use the program and where we can make it better. One thing we need to improve is how the program works with other apps. It would be great if it could work with more apps so that more people can use it in different ways. This would make the program more helpful for a lot of different people.

  While the program does its job pretty well, there are still some things we can do to make it even better. For example, it could be better at understanding what people say and giving them what they need. If we improve this, it would make the program easier to use and more helpful for everyone. I also looked at how people use the program, which helped me make it easier for them to use.

❑ **Step 7 - Demo and Presentation**

Demo: https://bot.dialogflow.com/4c98d095-cf60-464e-9d39-782766bc28db

Presentation: https://media.pdx.edu/media/t/1_9obmvr0z/335477932