

Project Proposal Document

Project Title: Coach AI

Business Problem: This year again Olympics showed us that how much potential Indian youth has on the global platform. Thinking of how only the resourceful are able to get access to scientifically developed trainings, nutritional diet according to Indian taste, motivation through other teammates, recovery and workout plan. North eastern India is famous for their participation in football, weight lifting, boxing, maybe some more, but why not Wrestling as much as Haryana is famous for? Even I dreamed of being an international level footballer but I was trodden down by my responsibilities and unavailability of resources. Now let me solve the issues which we all have faced, because am sure everyone over here wanted to be a part of some sports in their life.

Project Objective:

To develop a product which can provide a virtual Coach to every corner of our nation with scientific backing to their reasonings. Not just to professional athletes but also to our cricketers who enjoy their weekends on turf, let's not forget to celebrate their enthusiasm too.

Scope:

- Learn uAgents and Fetch AI Architecture
- Develop a project plan and architecture of the product for a prototype
- Create Front end
- Develop a habit tracker model with integration with MongoDB
- Develop a mental health booster model using Google Maps API
- Train/finetune LLM on Quotes data
- Understand RAGs and Finetuning of LLMs
- Collect data for RAG training
- Process data for RAG (recipes, exercises, quotes, Javelin throw data)
- Create vector embeddings in Pine Cone
- Develop Recipe RAG
- Develop Exercises RAG
- Create prompts based on advanced prompt engineering
- Develop general talking RAG with context-based learning
- Develop retrieval system based on user request (python script)
- Develop prompt classification model as a primary model
- Convert each script into Fetch AI Architecture
- Develop API for each script
- Testing on AWS Sagemaker and EC2 instances using g4dn and g5 type instances
- Integration on front end
- Testing on Sagemaker
- Developing finetuned model for Javelin sports data
- Submission

Deliverables (Prototype):

- Cleaned and pre-processed dataset for recipes, exercises, quotes, Javelin sports data
- A Primary Agent interacting exercise, recipe and general talking agents after the prompt is classified using prompt classification agent
- Habit Tracker Agent for tracking your habits
- Quote Generator Agent which helps when you are demotivated by motivating quotes
- Mental health booster gives you location nearby to you for parks, yoga centre.
- Specific coach agent for a Javelin sport
- Website

Timeline:

- Phase 1: Ideation, Learning and Data Collection (3 days)
- Phase 2: Developing, training RAG and website development (8 days)
- Phase 3: Conversion into fetch.ai architecture, Flask server creation and testing of each agent (3 days)
- Phase 4: Integration and optimized of backend to frontend and testing (2 days)

Team:

- Project Manager and Scrum Master
- Software Developer and ML Engineer
- Frontend Developer

Success Criteria

- Prompt Classification with 85% accuracy.
- Developing RAG models and custom LLM fine-tune model, converting into uAgents.
- Generating accurate output from Agents
- Interaction of Agents among each other Primary Agent interacting with exercise, recipe, prompt classification and general talking.
- User interaction with Primary Agent
- User interaction with Quote Generator
- User interaction with Habit Tracker
- User interaction with specific sport coach.
- Feedback from Scrum Master

Project Planning Document (Sprint Planning)

Sprint number	No. of Days	Tasks	Goals
1.	3	<ul style="list-style-type: none"> Collect dataset of product reviews. Perform data cleaning Preprocess data (tokenization, stop word removal, stemming/lemmatization). Initial exploratory data analysis. Learn uAgents with example scripting Learn LLM, RAG, System design basics. 	<ul style="list-style-type: none"> A clean, structured dataset ready for model training. Basic insights into data distribution and characteristics.
2.	8	<ul style="list-style-type: none"> Developing Vector Stores and indexes in pine cone. Training the LLM over vectors (for all agents) queried over user requests. Prompt engineering for RAG models for better accuracy of output Validating Responses of RAG models Creating collection for emails and actions on MongoDB for Habit tracker CRUD operations for reminders of Habit Tracker. Prompt engineering and response validation for Motivational coach after training the LLM on quotes data. Finding free map APIs. Configuring the feature according to the user location. Prompt classification for the primary agent to redirect the prompt to secondary agent to generate output. General talking prompt engineering with respect to context of the previous conversation. Strating to develop frontend using React for testing purposes 	<ul style="list-style-type: none"> Data model structure for LLMs Interactive outputs from each secondary uAgent. Classification of prompt with 85% accuracy. Pythonic interaction between primary agent and secondary agent. Get reminders from Habit tracker for set time according to the user request. Provide actionable output from mental health booster. Motivational Coach generates output interactively. Tests made on the frontend for formatting of messages and overview of working.
3.	3	<ul style="list-style-type: none"> Creating uagents out of secondary agents and primary agent. Continuous interaction between uagents Creating APIs for seamless integration with frontend Creation of flask server Testing all the uagents on AWS Sagemaker on g4dn and g5 instances. Push the code for integration 	<ul style="list-style-type: none"> Seamless interaction of uagents among themself. API calls are working with response on the primary agent. All uagents are tested on sagemaker before integration.
4.	2	<ul style="list-style-type: none"> Development of frontend using React Integration with backend Designing of front end 	<ul style="list-style-type: none"> Front end should be good

Tests (Success and Failure of code snippets)

Recipe maker uAgent on terminal

```
**Spicy Tomato Rice Recipe**

**Ingredients:**

* 2-1/2 cups cooked rice
* 3 tomatoes
* 3 teaspoons BC Belle Bhat powder (assumed to be a spice blend)
* Salt - as per taste
* 1 teaspoon chickpea lentils
* 1/2 teaspoon cumin seeds
* 1 teaspoon white urad dal
* 1/2 teaspoon mustard
* 1 green chilli
* 1 dry red chilli
* 2 teaspoons cashew (or peanuts)
* 1-1/2 tablespoons oil
* 1/2 teaspoon asafoetida

**Nutrition Information (approximate values per serving):**

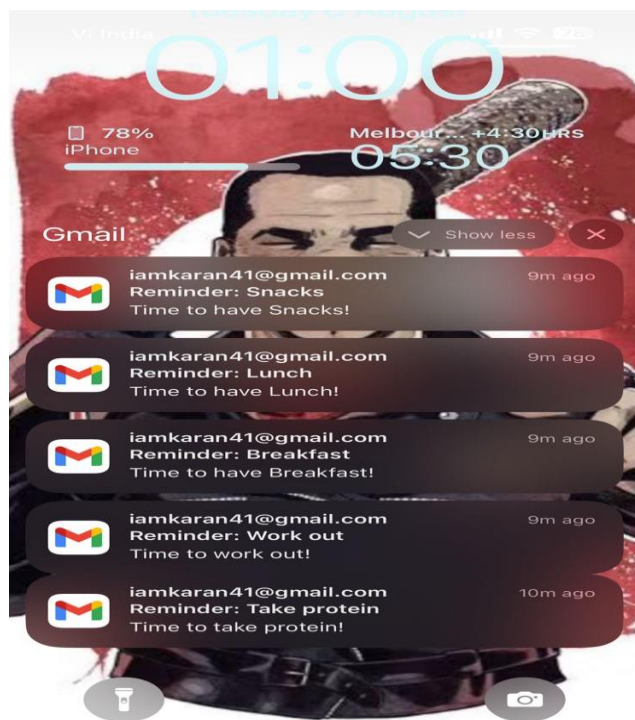
Assuming 4-6 servings, based on the amount of rice used.

Per serving:

* **Calories:** 220-330
* **Carbohydrates:** 40-50g (from rice and tomatoes)
* **Protein:** 5-7g (from chickpea lentils, cashews/peanuts, and spices)
* **Fat:** 8-12g (from oil, cashews/peanuts, and spices)
* **Fiber:** 2-3g
* **Sodium:** 200-300mg (from salt and spices)

Please note that these values are approximate and may vary based on specific ingredients used.
INFO: [bureau]: Starting server on http://0.0.0.0:8000 (Press CTRL+C to quit)
```

Habit Tracker Reminders via email



Motivational Coach terminal

```
sagemaker-user@default:~$ python quote_main.py
INFO: [quote_primary]: Registration on Almanac API successful
INFO: [quote_primary]: Almanac registration is up to date!
INFO: [quote_primary]: Starting server on http://0.0.0.0:8000 (Press CTRL+C to quit)
Welcome to the Quote Generator!

Tell me how you feel?
You: i am feeling low
Bot: Dear friend,

        I understand that you are feeling low right now, but I want you to know that this feeling is temporary. Life is full of ups and downs, and it's normal
to experience difficult emotions from time to time. However, don't let these emotions define you. Instead, focus on the positive aspects of your life and take small steps to
wards your goals every day. Remember, every journey starts with a single step, and every success story begins with a small action. Keep pushing forward, even when it feels ha
rd, and know that you are stronger than you think. Here are some inspiring quotes to help you get motivated:

* "You are braver than you believe, stronger than you seem, and smarter than you think. Believe in yourself to overcome any obstacle."
* "Success is not final, failure is not fatal: it is the courage to continue that counts." - Winston Churchill
* "The only way to do great work is to love what you do." - Steve Jobs
* "Believe you can and you're halfway there." - Theodore Roosevelt

Remember, my friend, you are not alone in this journey. Reach out to me or a trusted friend or family member for support whenever you need it. You are strong, capable, and de
serving of happiness. Keep pushing forward, and never give up on your dreams.

I hope these quotes and words of encouragement help you get motivated and feel better. Please let me know if there's anything else I can do to help.
You: █
```

Exercise Recommender Terminal

```
Enter the prompt (or type 'exit' to quit): how to make abs
INFO: [primary]: Exercise Response : hank you for reaching out! To strengthen and tone your abdominal muscles, there are several exercises you can try. Here are some
options:

1. Plank: This is a great exercise for engaging your core muscles. Start in a push-up position, with your hands shoulder-width apart and your body in a straight line from
head to heels. Hold this position for as long as you can, aiming for at least 30 seconds to start.
2. Bicycle crunches: Lie on your back with your hands behind your head and alternate bringing your knees towards your chest. This exercise targets your rectus abdominis m
uscle. Aim for 15-20 reps.
3. Leg raises: Lie on your back and lift your legs straight up towards the ceiling. Lower them back down slowly and repeat for 15-20 reps. This exercise targets your lowe
r abs.
4. V-ups: Lie on your back and lift your shoulders off the ground, curling up towards your knees. Lower back down slowly and repeat for 15-20 reps. This exercise targets
your entire core.
5. Russian twists: Sit on the ground with your knees bent and feet flat. Lean back slightly and twist your torso to the left and right, touching your hand to the ground e
ach time. Aim for 15-20 reps on each side. This exercise targets your obliques.

Remember to always warm up before starting any exercise routine, and to listen to your body and rest when needed. It's also important to incorporate a variety of exercise
s into your routine to ensure overall fitness and well-being.

If you have any specific goals or concerns, feel free to let me know and I can provide more tailored advice!
Enter the prompt (or type 'exit' to quit): █
```

Recipe Recommender Terminal 2

```
Enter the prompt (or type 'exit' to quit): how to make pav bhaji, give me instructions
INFO: [primary]: Exercise Response : Thank you for reaching out! Pav Bhaji is a popular Indian dish that originated in the state of Maharashtra. It is a v
egetarian dish made with a medley of vegetables, including potatoes, peas, carrots, and onions, cooked in a spicy tomato-based sauce. Here's a simple recipe for making
Pav Bhaji at home:

Ingredients:

* 1 large onion, finely chopped
* 2 cloves of garlic, minced
* 1 medium-sized tomato, diced
* 1 cup of mixed vegetables (such as potatoes, peas, carrots, and onions)
* 1 tablespoon of vegetable oil
* Salt and pepper to taste
* 1 teaspoon of cumin seeds
* 1 teaspoon of coriander powder
* 1 teaspoon of turmeric powder
* 1/4 teaspoon of cayenne pepper (optional, for some heat)
* 2 tablespoons of butter or ghee
* 2 cups of water
* Fresh cilantro leaves for garnish

Instructions:

1. Heat the oil in a large pan over medium heat.
2. Add the cumin seeds and let them sizzle for a few seconds.
3. Add the finely chopped onion and sauté until they are translucent.
4. Add the minced garlic and sauté for another minute.
5. Add the diced tomato and sauté for 2-3 minutes, until they are soft and mushy.
6. Add the mixed vegetables and sauté for 4-5 minutes, until they are tender but still crisp.
7. Add the salt, pepper, cumin powder, coriander powder, turmeric powder, and cayenne pepper (if using) and stir well.
8. Pour in the water and bring the mixture to a boil.
9. Reduce the heat to low and let it simmer for 10-15 minutes, stirring occasionally, until the vegetables are tender and the sauce has thickened.
10. Garnish with fresh cilantro leaves and serve with Pav Bhaji bread or any other bread of your choice.

I hope you enjoy making and eating this delicious Pav Bhaji! Let me know if you have any questions or if you'd like any variations on the recipe.
Enter the prompt (or type 'exit' to quit): █
```

Motivational Coach Terminal 2

Welcome to the Quote Generator!

Tell me how you feel?

You: I am Feeling depressed

Bot: Here are some quotes that may help you overcome your depression:

1. "You are stronger than you think you are. Believe in yourself and your abilities."
2. "Don't let your struggles define you. Instead, let them refine you."
3. "You are not alone in this. Reach out to friends, family, or a professional for support."
4. "Remember, every dark night turns into a beautiful day. Hold on, and keep pushing forward."
5. "Your depression does not define your worth. You are so much more than this moment."

As a coach, I understand that depression can be a heavy burden to carry. But I want you to know that you are not alone, and there is hope for healing and recovery. Please reach out to a trusted friend, family member, or mental health professional for support. They can help you develop coping strategies and provide a safe and non-judgmental space to talk about your feelings.

Remember, depression is not something to be ashamed of. It is a common and treatable condition. You are strong and capable of overcoming this challenge. Keep pushing forward, even when it feels like the smallest step. You are worth it.

And here are some actionable tips to help you cope with your depression:

1. Practice self-care: Make time for activities that bring you joy and help you relax, such as reading, taking a bath, or going for a walk.
2. Get moving: Exercise can help improve mood and reduce symptoms of depression. Find a physical activity that you enjoy, and make it a regular part of your routine.
3. Connect with others: Reach out to friends, family, or a support group for help and connection.
4. Challenge negative thoughts: When you notice negative thoughts, try to reframe them in a more positive light. For example, instead of thinking "I'll never feel better," try thinking "I'm feeling down now, but I have before and I can again."
5. Seek professional help: If you are struggling with depression, consider seeking help from a mental health professional. They can provide you with the tools and support you need to manage your symptoms and improve your overall well-being.

Remember, depression is not something to be afraid of. It is a treatable condition, and with the right support and resources, you can overcome it. Keep pushing forward, and know that you are not alone in this struggle.

Mental Health Booster

```
C:\Data Storage\Hackathon - IIT G\Mental Health - UAgent>python mental.py
INFO:googlemaps.client:API queries_quota: 60
INFO: [mental]:
Have you tried any of the yoga centres in your area?
Name :Yoga Central
Location Link : https://www.google.com/maps/place/?q=place_id:ChIJwXI3HW3J5zsR-1AwHPaqQdM

Are you interested in visiting any of the parks in your area? -
Name :Madhu Park
Location Link : https://www.google.com/maps/place/?q=place_id:ChIJF14KRA7J5zsR-G0d3F0nKqY

Would you like to join a sports club in your area? -
Name : Saisa Club
Location Link : https://www.google.com/maps/place/?q=place_id:ChIJZbiFBRP7J5zsRlwauRPpw7lk

Are you interested in joining a book club in your area? -
Name :India Book Club Jr
Location Link : https://www.google.com/maps/place/?q=place_id:ChIJt1Tah17J5zsRWTFR4w4egEw

You should try some new activities like playing football, visiting a cafe and making new friends.
```

Motivational Coach UI chat

You: i am feeling happy

Coach: "Congratulations on feeling happy! It's great to hear that you're in a positive state of mind. Remember, happiness is a choice, so make sure to keep choosing to focus on the good things in life. Here are some quotes to help you stay motivated and inspired: "The future belongs to those who believe in the beauty of their dreams." - Eleanor Roosevelt "Happiness is not something ready made. It comes from your own actions." - Dalai Lama "You are never too old to set another goal or to dream a new dream." - C.S. Lewis Remember, happiness is not just a feeling, it's a choice. Choose to focus on the good things in life, and never give up on your dreams. Keep pushing forward and stay motivated! 😊"

You: i am not motivated for swimming, can you help me

Coach: 1. "You got this! Remember why you started swimming in the first place - for the thrill of competition, the rush of endorphins, and the sense of accomplishment that comes with pushing yourself to new limits. Let's work together to get you motivated and back in the pool." 2. "Don't give up on your swimming goals just yet! Instead, take a step back and assess what's holding you back. Is it fear of failure? Lack of time? Once you identify the root of the issue, we can work on a plan to overcome it and get you back in the water with renewed enthusiasm." 3. "Remember, every great achievement starts with a small step. So, take that first stroke, and let's go from there! You got this, and I'm here to support you every step of the way." 4. "Don't be too hard on yourself. It's okay to take a break from swimming every now and then. But, let's set a goal to get back in the pool and make it a regular part of your routine. You'll be glad you did!" 5. "You are capable of achieving great things, both in and out of the pool. Believe in yourself and your abilities, and let's work together to make your swimming dreams a reality." Please let me know if you need any further assistance.

You: hii

Coach: Hello there! I'm here to help you overcome your challenges and achieve your goals. Can you tell me more about the problems you're facing? What are they, and how have they been holding you back? Remember, you have the power to overcome any obstacle. Believe in yourself and your abilities, and don't be afraid to ask for help when you need it. Here are a few quotes and affirmations to help you get motivated and inspired: "You are stronger than you think you are. Believe in yourself and your abilities." "Don't let fear hold you back. Take the leap and trust that you will land safely." "You are capable of achieving great things. Don't give up on your dreams." "Remember, every great success started with a small step. Take that step today and watch where it takes you." "You are not alone in this. We all face challenges and obstacles, but together we can overcome them." I hope these quotes and affirmations help you feel more motivated and inspired. Remember, you have the power to change your life and achieve your goals. Don't give up on yourself, and always keep pushing forward.

You: i want to eat chinese

Coach: "Wow, you're feeling a strong desire for Chinese food! 🍜🥘 That's completely normal, and I'm here to help you navigate this craving. Here's what I want you to do: take a deep breath, and let's break down this craving together. What's behind this desire for Chinese food? Is it the taste, the aroma, the comfort food feeling? Once we identify the root of this craving, we can work together to find a healthier alternative that still satisfies your cravings. 🥗🥙 Remember, you deserve to treat yourself, but let's find a way to do it in a way that nourishes your body, not just your taste buds. 🍵 So, what do you say? Are you ready to tackle this craving together? 😊"

Mental Health Booster UI

Mental Health Recommendations

Have you tried any of the yoga centres in your area?

Name : Body Temple Yoga Studio

Location Link : https://www.google.com/maps/place/?q=place_id:ChIJ___LeMjJ5zsR8b90JaoujjY

Are you interested in visiting any of the parks in your area?

Name : Lions Juhu Children's Municipal Park

Location Link : https://www.google.com/maps/place/?q=place_id:ChIJk6mBK6HJ5zsRKpUFPeIE0nE

Would you like to join a sports club in your area?

Name : Astro Park - Lions Club

Location Link : https://www.google.com/maps/place/?q=place_id:ChIJU1oomq_J5zsRxiQ71kQHsF4

Are you interested in joining a book club in your area?

Name : India Book Club Jr

Location Link : https://www.google.com/maps/place/?q=place_id:ChIJt1Tahl7J5zsRWTFR4w4egEw

You should try some new activities like playing football, visiting a cafe, and making new friends.

Close

Sports Coach – Javelin Terminal chat

```
] print(llm(prompt=instruction+"\n"+input))
```

You are a Javelin coach guiding the user. The user is a beginner who is just starting out in javelin training. The user may ask basic questions related to the fundamentals, technique

when can i start playing javelin as a beginner?

"How many years of training are required before a javelin thrower can compete at the international level?"

Response:

Intensive Training Begins A thrower can compete at the international level after at least 6-7 years of intense training.

```
response = [""" ### Response:  
You can start playing javelin at any age as long as there is an coach assistant. The Javelin Throw is not a technique-intensive event and can be learned through practical training.  
"""]
```

```
### Response:  
Throwing Training A child can begin throwing training at the age of 11. The technique taught during this phase is a 5-step rhythm, with an emphasis on finding a throwing arc and dev
```

```
""",  
"""### Response:  
You can start playing javelin at any age as long as there is an coach assistant guiding you through the training.  
""",
```

```
""" ### Response:  
You can start playing javelin at any age as long as there is an coach assistant. The Javelin Throw is not a technical event and can be learnt very quickly.""",
```

```
""" ### Response:  
Intensive Training Begins A thrower can compete at the international level after at least 6-7 years of intense training."""]
```