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Research and Problem Identification for AI Agents

AI agents are autonomous systems that sense their environment, make decisions, and act to achieve goals. They are characterized by autonomy, reactivity, proactiveness, and adaptability through learning. Types include reactive agents that respond directly to inputs, deliberative agents that plan before acting, learning agents that improve through data, and conversational agents that interact through natural language. Examples range from Siri and Alexa to self-driving cars and online recommendation engines.

Python libraries such as LangChain and Rasa support conversational systems, while the OpenAI API provides advanced language models for natural dialogue and personalization. Cloud services like Azure AI Agents, Google Dialogflow, and IBM Watson make large-scale deployment possible. For this project, the OpenAI API is most relevant because it enables personalized conversation and feedback, essential for tailoring health and fitness recommendations.

The problem being addressed is the lack of individualized diet and workout guidance. Generic plans often fail to account for different body types, schedules, or preferences. The proposed AI agent will create customized diets and routines, track progress, and adjust recommendations to keep users motivated and consistent.

The goal is to help people build sustainable healthy habits. Objectives include collecting user data, generating tailored plans, and adapting them over time while offering reminders and

support. Success will be measured by user engagement, satisfaction with personalization, and reported improvements in health.

Research into agent types, tools, and applications has guided the design, showing why a conversational and adaptive approach is the best fit for this project.