Case til stillingen som AI-udvikler i PFA

Denne opgave er både hands-on og lidt teoretisk i sin natur. Det handler om, hvordan du ville bygge en poc på en AI-agent og udstille det i et "produktionsklart" API.

Helt konkret ønskes det, at du laver en AI agent, som kan besvare spørgsmål inden for et begrænset vidensdomæne. Vidensbasen er indsat i bilag2.

Du kan benytte enhver sprogmodel i din rådighed, men hvis du ikke har adgang til en sprogmodel programatisk, kan du oprette en account hos Google AI Studio, og generere en API-key, derigennem. Se evt. bilag 1. Hvis du på ingen måder kan få en sprogmodel til at virke, er det også okay at mocke en.

Brug ikke mere end maks 4 timer på det. Det er vigtigere, at du har gjort dig gode tanker, så vi kan få en dialog, end at du når at implementere det hele. Dog ser vi gerne, at der er lavet noget kode, vi kan se på.

I casen forventes det, at du:

- Bygger en agent til at besvare spørgsmål omkring den vedhæftede viden.
- Udstiller agenten i et fastAPI i python med et chat endpoint til at kalde agenten.
- Har gjort dig tanker vedrørende input validering, error håndtering, logging og general god kode praksis.
- Skriver dokumentation af dit API med Swagger
- Uploader din kode til et offentlige github repositry, så vi kan læse den.
- Har en .README der forklarer hvordan man kan starte API'et op lokalt hvis vi vil teste det
- Laver en kort præsentation på 5-10 min, hvor du gennemgår det, du har bygget, dine tanker bag, og hvordan du evt. kunne forbedre det, hvis du havde mere tid.

Yderlige ting du ville kunne overveje, og evt. udvikle hvis tiden er til det:

- Lave en dockerfil for API'et
- Bruge github actions til at opsætte CI/CD
- Tænk over evaluering af kvaliteten af agenten. Hvordan gribes det an?
- Tænk over, hvordan du kan styre cost vs latency
- Tænk over, hvordan du kan/vil håndtere, hvis agenten ikke må svare på spørgsmål uden for vidensbasen
- Vibe-coding er fint, hvis processen/tilgangen til at løse problemet kan diskuteres.

Som nævnt er det ikke noget du skal bruge mange timer på – det er bare så vi har noget teknisk at tage udgangspunkt i til næste samtale 😊 Du må derudover meget gerne sende linket til dit github repo senest dagen før samtalen så vi kan nå lige at kigge på det.

Hvis du har nogle spørgsmål derudover, så kan du altid bare skrive eller ringe til mig.

Bilag 1: Guide til at kalde en sprogmodel fra google

1. Gå til https://aistudio.google.com/
2. Login med google bruger. Alternativt lav en ny gratis bruger
3. Klik på Get API Key i bunden til venstre
4. Alternativt bliver du bedt om at generere et nyt projekt
5. Projektet får tildelt en API-key, du nu kan kopiere og benytte

https://ai.google.dev/gemini-api/docs/quickstart

```
<<Python>>
from google import genai

# The client gets the API key from the environment variable `GEMINI_API_KEY`.
# Alternatively, you can pass it directly when creating the client.
client = genai.Client(api_key="your API KEY")

response = client.models.generate_content(
  model="gemini-2.5-flash-lite", contents="Explain how AI works in a few words"
)
print(response.text)
<<Python>>
```

Bilag 2: Fiktiv vidensbase

Company Overview: Northstar Culinary Technologies

Northstar Culinary Technologies is a Danish design and technology company founded in 2017 and headquartered in Copenhagen, Denmark. The company specializes in high-quality kitchen gadgets that integrate embedded AI to support precision cooking, food preparation, and kitchen workflow optimization. Northstar Culinary Technologies positions itself at the intersection of Scandinavian industrial design, advanced sensor technology, and applied artificial intelligence.

The company employs approximately 140 people across product engineering, industrial design, embedded systems, software development, manufacturing operations, and customer support. Its primary markets are the Nordic countries, Germany, France, and Japan, with a growing direct-to-consumer presence in North America. Products are sold through a mix of premium retail partners and the company's own online store.

Northstar Culinary Technologies' mission is to "make professional-grade cooking accessible without sacrificing craftsmanship or control." Internally, the company emphasizes durability, precision, and user trust. AI features are designed to assist rather than automate decision-making, and users are always able to override or disable intelligent features.

The company is privately held and funded by Danish private investors and a family-owned industrial design group. It has been profitable since 2022 and prioritizes long product lifecycles and repairability over rapid product turnover.

Product Portfolio

Northstar Culinary Technologies currently produces four flagship kitchen products, each combining physical craftsmanship with embedded intelligence.

Aegis Cooktop is a portable induction cooktop designed for precision temperature control. It uses onboard sensors and AI-based thermal modeling to maintain stable pan temperatures regardless of pan material or food load. Users can select manual mode or guided cooking profiles, such as low-temperature sauces or high-heat searing.

Sentinel Chef Knife is a professional-grade chef's knife with an integrated grip sensor and inertial measurement unit. When paired with the companion app, it provides feedback on cutting technique, consistency, and safety. The knife functions fully without digital features; all AI-assisted feedback is optional and processed locally on the paired device.

Orion Smart Scale is a high-precision kitchen scale capable of detecting ingredient type and density using weight patterns and optional camera input. It assists with portioning, recipe scaling, and nutritional estimation. All recognition models are stored locally on the device or user phone.

Lumen Oven Probe is a wireless temperature probe designed for ovens and grills. It uses predictive modeling to estimate remaining cooking time and resting behavior for meats and baked goods. The probe operates independently but integrates with the Northstar mobile application ecosystem.

All products are designed to function without cloud connectivity. Cloud services, when enabled, are limited to firmware updates, optional recipe synchronization, and anonymized diagnostics.

Organizational Structure and Leadership

Northstar Culinary Technologies operates with a product-centric organizational structure.

The CEO and founder, Anders Holm, is responsible for company vision, brand, and long-term strategy. He has a background in industrial design and previously worked in high-end kitchen equipment manufacturing. The CTO, Sofie Lindberg, leads embedded systems, AI development, and software architecture, with a strong emphasis on on-device intelligence and reliability.

Product teams are organized around individual devices rather than functional domains. Each product team includes industrial designers, mechanical engineers, embedded software engineers, and QA specialists. A central AI platform team maintains shared models, tooling, and evaluation standards.

Manufacturing and supply chain operations are managed internally, with final assembly performed in Denmark and selected components sourced from long-term European partners. Customer support and repair services are based in Copenhagen to support the company's focus on longevity and sustainability.

Major product decisions require joint approval from design, engineering, and compliance leadership.

AI, Data, and Ethics Policies

Northstar Culinary Technologies maintains strict internal policies governing the use of AI and data.

All AI features must default to local, on-device processing. No raw sensor data is transmitted off the device without explicit user consent. When cloud features are enabled, data is anonymized and used solely for product improvement, not for advertising or resale.

The company enforces a "human-in-control" principle: AI systems may suggest, guide, or warn, but must not prevent users from performing actions. Safety-critical features, such as temperature alerts, are advisory rather than restrictive.

Model updates undergo extensive validation using real-world cooking scenarios. Any change that materially affects device behavior must be documented and communicated to users through release notes.

Northstar Culinary Technologies does not train generalized models on user data. Personalized features, where present, are trained locally and remain bound to the user's device.

Customer Experience and Support

Northstar Culinary Technologies positions customer experience as a core part of its brand.

Each product includes comprehensive documentation, both physical and digital, explaining not only how to use the device but how its intelligent features work. The company avoids opaque terminology and explicitly describes limitations of its AI systems.

Customer support is available during Danish business hours, with multilingual support for key markets. Repair and replacement services are designed to favor repair over replacement, and spare parts are made available for at least seven years after product release.

Software updates are optional and reversible. Customers may choose to remain on older firmware versions without losing core functionality.

Feedback from customers is collected through structured surveys and beta programs. While feedback strongly influences future designs, the company explicitly avoids feature creep that could compromise simplicity or reliability.