



# Software Engineer - QA Voice Agent

Take Home September 2025

## Background Context

You're joining a team that builds AI voice agents for e-commerce customer support phone calls. We handle calls for various intents including order fulfillment, returns and exchanges, product questions, membership inquiries, store information, etc.

As we scale and launch new features, we need an automated QA system that can analyze call transcripts at scale. Human QA requires hours manually reviewing calls to understand success and failure patterns, but we want to build an AI agent to replicate and improve this process.

## The Problem:

Our current binary metric (automated vs escalated) doesn't tell the full story:

Automated calls can be

- Successful - customer helped AND issue resolved
- Unsuccessful - customer hung up before issue unresolved despite no escalation

Escalated calls can be

- Partially successful - we helped before escalation (provided info, started return process)
- Unsuccessful - customer immediately wanted human, or we failed to help them

## Your Task

Build a **QA agent** that can analyze call transcripts and provide detailed insights beyond our current binary classification.

## Core requirements

1. Design a prompt-based analysis system that can categorize calls and identify success and failure patterns
2. Bonus: Evaluate and compare different models and approaches (e.g., llama, qwen, openai, anthropic, mistral, gemini, etc) and provide a recommendation with reasoning
  - Feel free to make reasonable assumptions where requirements are unclear. We're interested in your problem-solving approach and how you think about prompt engineering for complex classification tasks.
  - Finally, focus on quality over quantity. A well-executed simple solution is better than an overly complex one that doesn't work reliably!

## Submission requirements

1. **Code**
  - Python scripts with your QA analysis functions
  - Your actual prompts (clearly labeled and documented)
  - Requirements.txt file
  - Example showing how to run your system on the sample data
2. **Prompt**
  - The specific prompts you designed for different analysis tasks
  - If using multiple prompts - how your prompts work together, any prompt chaining or multi-step analysis you implemented
3. **Model comparison**
  - Results from testing different models
  - Performance comparison across key metrics (accuracy, speed, cost, reliability)
  - Clear recommendation with reasoning for which model/approach works best
  - Any trade-offs or limitations discovered
4. **Sample outputs**
  - Your system's analysis of the provided sample transcripts
  - Show outputs for different call types (successful, unsuccessful, escalated)
5. **Bonus - Video recording**
  - Walk through your code and prompts (using loom, zoom, etc)
  - Demo running it on a sample transcript
  - Quick explanation of your model choice

## What we're looking for

- Practical problem-solving - how do you approach a real business challenge?
  - Technical execution - clean code that actually works on the sample data
  - Analytical thinking - thoughtful comparison methodology and clear reasoning
  - Communication - ability to explain technical decisions and trade-offs
  - Business awareness - understanding of how your solution addresses the core problem
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## Mock sample data ("Nike")

### Call 1 - Automated (Successful)

**Intent:** Order Status

**Outcome:** Automated - Successful

**AI Agent:** Hi, thanks for calling Nike. Am I speaking with Sarah?

**Customer:** Yes.

**AI Agent:** Hi Sarah, thanks for calling. I can access your account and help answer any questions. What can I help you with today?

**Customer:** I'd like to know the status of my order.

**AI Agent:** Is this about your order for the Air Max 270 sneakers in black?

**Customer:** Yes, that's right.

**AI Agent:** I've pulled up your order. It looks like your order is currently on its way to you and will be delivered by FedEx. You should receive it by tomorrow at 3 PM. Did you have any other questions?

**Customer:** The package is being delivered, but they sent it to the wrong address.

**AI Agent:** I'm sorry to hear your package was delivered to the wrong address. If you're unable to locate the package, please allow 5 business days after the delivery date, then contact our customer service team for further assistance. Is there anything else I can help you with?

**Customer:** No, thank you.

**AI Agent:** Great, thanks for calling Sarah. Have a great day.

### Call 2 - Automated (Partially Successful)

**Intent:** Return Status

**Outcome:** Automated - Partially Successful

**AI Agent:** Hi, thanks for calling Nike. Am I speaking with Mike?

**Customer:** Yes.

**AI Agent:** Hi Mike, welcome back. I can access your account and help answer any questions. What do you need help with today?

**Customer:** Return order.

**AI Agent:** Are you checking on the status of a return, or would you like to start a new return?

**Customer:** Checking on status of return.

**AI Agent:** Is this about your return for the Jordan 1 High sneakers?

**Customer:** Yes.

**AI Agent:** I've pulled up your order. To check your return status for the Jordan 1 High sneakers, I recommend visiting our returns portal. Would you like me to text you a link where you can view more information?

**Customer:** Yes, please.

**AI Agent:** Great, I've just sent that to you. Was there anything else you needed help with?

**Customer:** Customer service.

**AI Agent:** The best way to reach our team is by email at [help@nike.com](mailto:help@nike.com), but I can also help. Is there anything else I can try to help with?

**Customer:** Customer issue.

**AI Agent:** I'll connect you with a team member who can help you.

**AI Agent:** Thanks for calling Nike. Our customer service team is experiencing higher than normal volume. We are available to answer all inquiries by email at this time. Please reach out to us directly at [help@nike.com](mailto:help@nike.com). We appreciate your understanding. Have a great day.

### **Call 3 - Escalated (Partially Successful)**

**Intent:** Return/Refund Issue

**Outcome:** Escalated - Partially Successful

**AI Agent:** Hi, thanks for calling Nike. Am I speaking with Jessica?

**Customer:** Yes.

**AI Agent:** Hi Jessica, thanks for calling. I can access your account and help answer any questions. What can I help you with today?

**Customer:** I submitted a return and haven't received a refund.

**AI Agent:** Are you checking on a return you've already submitted, or would you like to start a new return?

**Customer:** Checking on the status.

**AI Agent:** Is this about your order for the Nike Dri-FIT running shirt?

**Customer:** No.

**AI Agent:** Can you tell me your order number, any items that were included, or the date you placed it?

**Customer:** Give me one minute.

**AI Agent:** Sure, take your time. Let me know when you're ready.

**AI Agent:** I'm not hearing anything. Take your time, let me know when you're ready.

**Customer:** I'm ready. The order number is NK8421357.

**AI Agent:** I think you said the order number is NK8421. Is that correct?

**Customer:** No.

**AI Agent:** If you have it handy, please say your order number again.

**Customer:** NK8421357.

**AI Agent:** I found your order. Your order number is 8421357, and I see it was fulfilled. Would you like me to text you a link where you can view more information?

**Customer:** No. I returned 2 items and haven't received a refund.

**AI Agent:** I see you returned 2 items from your order, and I apologize you haven't received your refund yet. Please allow up to 14 business days for the refund to process after we receive the returned items.

**Customer:** It has been 14 days.

**AI Agent:** I apologize it's been 14 days and you still haven't received your refund. I can send you a text with a link to our returns portal where you can check your return status.

**Customer:** Yes, please.

**AI Agent:** Great, I've just sent that to you. Was there anything else you needed help with?

**Customer:** Yeah, I'd like to speak with somebody about this.

**AI Agent:** The best way to reach our team is by email at [help@nike.com](mailto:help@nike.com), but I can also help. Is there anything else I can try to help with?

**Customer:** Can you have somebody call me?

**AI Agent:** I'll connect you with a team member who can help you.

**AI Agent:** Thanks for calling Nike. Our customer service team is experiencing higher than normal volume. We are available to answer all inquiries by email at this time. Please reach out to us directly at [help@nike.com](mailto:help@nike.com). We appreciate your understanding. Have a great day.

#### **Call 4 - Escalated (Unsuccessful)**

**Intent:** Product Question

**Outcome:** Escalated - No Human Available

**AI Agent:** Hi, thanks for calling Nike. Am I speaking with David?

**Customer:** Yes.

**AI Agent:** Hi David, thanks for calling. I can access your account and help answer any questions. What can I help you with today?

**Customer:** I need help with sizing for the Air Force 1s. I usually wear a 10 but heard they run big.

**AI Agent:** I can help with general sizing information. Air Force 1s typically run about half a size large, so many customers size down. However, for the best fit recommendation, I'd like to connect you with our product specialist.

**Customer:** That would be great.

**AI Agent:** Let me transfer you to our product team now.

**AI Agent:** Thanks for calling Nike. Our customer service team is experiencing higher than normal volume. We are available to answer all inquiries by email at this time. Please reach out to us directly at [help@nike.com](mailto:help@nike.com). We appreciate your understanding. Have a great day.

#### **Call 5 - Escalated (Unsuccessful)**

**Intent:** Membership Question

**Outcome:** Escalated - No Human Available

**AI Agent:** Hi, thanks for calling Nike. Am I speaking with Lisa?

**Customer:** Yes.

**AI Agent:** Hi Lisa, thanks for calling. I can access your account and help answer any questions. What can I help you with today?

**Customer:** I want to cancel my Nike membership and get a refund for this month.

**AI Agent:** I understand you'd like to cancel your Nike membership. For membership cancellations and refund requests, I'll need to connect you with our membership team who can process that for you.

**Customer:** Okay, please do that.

**AI Agent:** Let me transfer you now.

**AI Agent:** Thanks for calling Nike. Our customer service team is experiencing higher than normal volume. We are available to answer all inquiries by email at this time. Please reach out to us directly at [help@nike.com](mailto:help@nike.com). We appreciate your understanding. Have a great day.