



Smart Cities Hackathon Tier 1 Challenge 0

Tier 1: Challenge 0



Welcome to the aql hackathon! To get started, either scan the following QR code, or carefully type the website address into your browser's address bar. Once you're there you'll have to enter some login information. You should use an email address and username of your choice, with a secure password. Be sure to make a note of your password.



Once you've entered and submitted your details, you should be prompted to verify your email address. Go to your email inbox and click on the verification link. This should lead you to the aql Marvin homepage, with your account logged in.

Let's get acquainted with this page, as we'll be using it for the remainder of the hackathon. On the left hand side of the screen you should see a dropdown labelled 'Choose assistant...', with a button labelled '+ New Chat' below it. Select the challenge 0 assistant from the dropdown, then click the '+ New Chat' button. If at any point you need to create a fresh chat with Marvin or change the assistant that you're using, this will be how you do it.

Challenge 0: Learn how to interact with an AI

You should now have everything in place to work through challenge 0. This challenge will walk you through effectively using Marvin, our in-house AI. Marvin can do brilliant things, but like all tools it is only as good as the person who is using it. Each of the following exercises will guide you towards writing high-quality prompts, allowing you to get the most out of not just Marvin, but any other AI too. Each of the following exercises illustrates some aspect of good prompt writing technique.

As you progress through your sheet, be sure to carefully read what Marvin writes. By the end of the sheet you should know how to get clear, easy to follow replies in a style that suits you. Good luck!

1. Setting the Tone of the Conversation

In 2024 most people can spot AI written content from a mile away. Did you know that with prompting you can completely change the writing style of an AI? This can come in handy if you want your answers to be either simpler or more technically detailed.

To see this, try prompting Marvin with a question like:

"Explain IoT."

Now try asking it the same question, but this time prompt for less technical detail:

"Explain IoT as if I'm a 10-year-old."

Or more technical detail:

"Explain IoT in a scientific tone with detailed formulas."

This technique can be useful if you don't initially understand what Marvin is telling you. Start off with simpler, easier to understand output then progress to more advanced! As you progress through the rest of this exercise sheet, try to experiment with the different AI tones and styles.

Task 2. Clear Prompting

People have gotten pretty good at using Google to find information that they're interested in online. Googling usually works best if you enter the keywords that filter your results to a list of relevant material, which you can then skim through to find the information you want. AI works best when you do the opposite! If your prompt doesn't completely specify what it is that you need to know, then the AI can't give you the help or information you need. Let's see this by asking Marvin a vague question, like:

"Tell me about the MQTT."

This should give you some correct, but vague information as a response. Try again, but this time try specifically requesting details of interest:

"Explain the purpose of MQTT and how it works."

"What are the most common uses of MQTT?"

This time we should have much higher quality, targeted information. When working through the challenges for this hackathon, make sure to explain exactly what you want Marvin to do at each step!

3. Iterative Feedback

Very often an AI is capable of giving you the answer you want, but fails to do so on the first attempt. By iterating on the original question, you can nudge the AI towards providing the information or functionality you want over the course of the conversation.

Let's try getting Marvin to produce something techy:

"Give me a program that displays the current date and time in a user-friendly format, and updates it every second. I would like it placed in a HTML file."

This should give us some nice code that we can paste into a file and open in a web browser (If you're not sure how to do this step, try asking Marvin using the techniques you've learned here).

Once you've done that, try iterating on the output:

"How about showing me the time on a clock face instead?"

This should give you a completely new page, with a clock design made just for you.

See what other variations on this idea you can get out of Marvin. Can you do anything interesting with the colour or size of the clock? Can you create something else entirely? Be creative and see what happens!

4. Getting Help With Your Code

Try saving the following block of code into a .html file as you did for the previous exercise, and running it:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width,
initial-scale=1.0">
  <title>Click Counter</title>
</head>
<body>
  <h1>Click Counter</h1>
  <p id="counter">Clicks: 0</p>
  <button id="clickButton">Click me!</button>

  <script>
    let count = 0;
```

```
document.getElementById('clickButton').onClick =  
function() {  
    count = count++;  
    document.getElementById('counter').innerHTML =  
`Clicks: ${count}`;  
};  
</script>  
</body>  
</html>
```

You should see a counter, and a button that you changes the counter on each click. Unfortunately there's something wrong with the code... The counter never changes. See how long it takes you to spot the issue (don't worry if you find that you can't, just move on to the next step). Now give your code to Marvin and ask it to spot the issue. You should have an immediate fix for the bug(s) in your code, with a set of easy to understand explanations for what went wrong! In general Marvin is very good at spotting small details and providing quick feedback, so don't be afraid to use it for this purpose.

5. Take Care with Leading Questions

When giving Marvin a description of what it is you need, bear in mind that if you tell it to do something that doesn't really make sense, then it will try to do something that doesn't really make sense. For example, let's take the prompt that we used earlier, telling Marvin to build us a clock, and change it slightly:

"Give me a program written in Python that displays the current date and time in a user-friendly format, and updates it every second. I would like it placed in a HTML file."

All we've changed is that we specify that the program should be written in the Python programming language. The solution we get from Marvin this time around should solve the same problem, but in addition to the required HTML file it provides instructions that needlessly integrate Python. The lesson here is that you should take care not to specify anything that you aren't sure of in your prompt. Sometimes saying less is more!

6. Cutting Your Losses

This segment contains some general advice for dealing with AI, and doesn't have any exercises. You should still have a read of it and try to bear the contents in mind as you move forward with the hackathon.

An unfortunate problem with modern AI is that it struggles to identify when it's mistaken, or to switch between different approaches when solving a problem. In effect, AI sometimes acts

like a stubborn person, unwilling to take a different view of a situation. This means that if you find after a long conversation with the AI you still don't seem to have made any progress, your best bet could be to scrap the conversation and start a fresh one. By taking care to start the conversation off with a fresh prompt that steers the AI away from its first line of reasoning, you stand a better chance of reaching a usable solution.

That's it for this worksheet, you're now ready to move on with the rest of the hackathon. Good luck!