Prompting with a Pinch of Logic and Code: Your AI Starter Kit

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Introduction: The Magic of Giving Instructions

Imagine you're in a kitchen, and you're trying to bake a cake. You have all the ingredients, but you don't know exactly how to put them together. So, you call your friend, a great baker, and say, "Hey, I have flour, sugar, eggs, and butter. I want to make a cake. Can you help me?"

That, in its simplest form, is what we are going to learn: how to give the right instructions to get what you want. In our case, instead of your friend, we'll be talking to AI. This book will teach you how to give instructions (we call these instructions "prompts") to AI tools, and we'll see that just like any recipe, the way you phrase your request matters a lot. It's a bit like learning a new language, but a language that machines understand – and it's all about logic and a bit of code! So, let's dive in!

1 Talking to AI – The Power of Prompts

We're beginning our journey into the world of Artificial Intelligence, and like learning any new language, we need to understand how to communicate with it. The first step in doing this is through something we call "prompting." A prompt is simply an instruction that we give to an AI. It's how we tell it what we want it to do.

Here's a simple example: imagine we want AI to create a list for us, we can give it a prompt like "Write me a list with 10 random numbers in it, then print it."

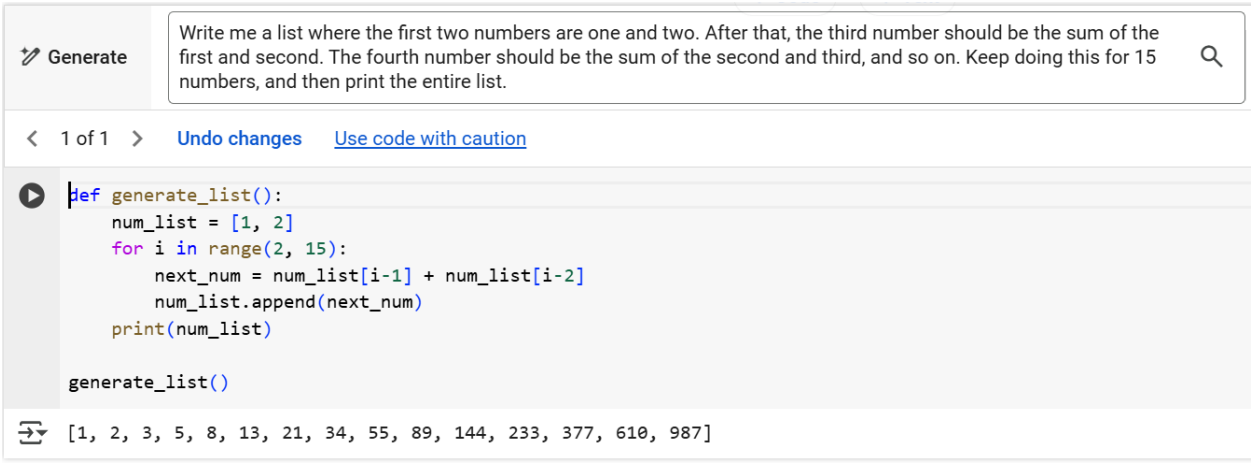
We might think this is a straightforward request, but as we will see, the way we phrase our prompts can change the outcome drastically.

1.1 Starting Simple: Creating Lists

Let's take our number list example a bit further. We can ask AI to create a list following a certain pattern:

"Write me a list where the first two numbers are one and two. After that, the third number should be the sum of the first and second. The fourth number should be the sum of the second and third, and so on. Keep doing this for 15 numbers, and then print the entire list."

The AI can follow these instructions and generate a sequence like 1, 2, 3, 5, 8, and so on. This might remind you of something called the "Fibonacci sequence".



1.2 Refining Our Prompts: Less is More

Sometimes, we can get the same result using a much shorter prompt. In our case, instead of writing lengthy instructions, we could have simply said "Generate a Fibonacci sequence list starting with 1 and 2, and give me the first 15 numbers." See how much shorter this instruction is compared to our previous version?

The lesson here is: try to be clear, and try to be concise. It is all about learning how to get to the point when giving instructions to the AI.

1.3 Beyond Simple Numbers: Transforming Lists

Now, let's imagine we have a list of numbers, and we want to create a new list based on the original one. For example, if our original list is 1, 2, 3, 4, 5... we want to generate a new list where every number is one more than the corresponding number in the original. So, the new list would be 2, 3, 4, 5, 6....

This might seem basic, but this concept of transforming lists is very useful. A countdown timer is a real-world example of a transforming list. Think of each second or day going by and how it decreases a countdown timer; this represents a type of sequence with direct applications in real life.

2 Logic and Conditions: Making AI Smarter

Now, let's add another layer of intelligence to our interactions with AI. Let's explore the concept of conditions.

2.1 Checking Conditions: The "If" Logic

Imagine we want to create a student's report card. We can prompt the AI by giving it details like the student's name, and the marks in three subjects. Once the AI knows this, it needs to process the information. We can tell the AI:

"Read the name and marks in three subjects for a student. Calculate the total marks, the average marks, and then display the report card. Also, assign a grade to the student based on their marks. If the student's grade is F, then also output: grade needs improvement."

```
# Input student details
name = input("Enter student's name: ")
subject1 = float(input("Enter marks in subject 1: "))
subject2 = float(input("Enter marks in subject 2: "))
subject3 = float(input("Enter marks in subject 3: "))

# Calculate total and average marks
total_marks = subject1 + subject2 + subject3
average_marks = total_marks / 3

# Assign a grade based on the average marks
if average_marks >= 90:
  grade = "A"
elif average_marks >= 80:
  grade = "B"
elif average_marks >= 70:
  grade = "C"
elif average_marks >= 60:
  grade = "D"
elif average_marks >= 50:
  grade = "E"
else:
  grade = "F"


# Display the report card
print("\n--- Report Card ---")
print("Student Name:", name)
print("Subject 1 Marks:", subject1)
print("Subject 2 Marks:", subject2)
print("Subject 3 Marks:", subject3)
print("Total Marks:", total_marks)
print("Average Marks:", average_marks)
print("Grade:", grade)

# Output additional message for grade F
if grade == "F":
  print("Grade needs improvement.")
```

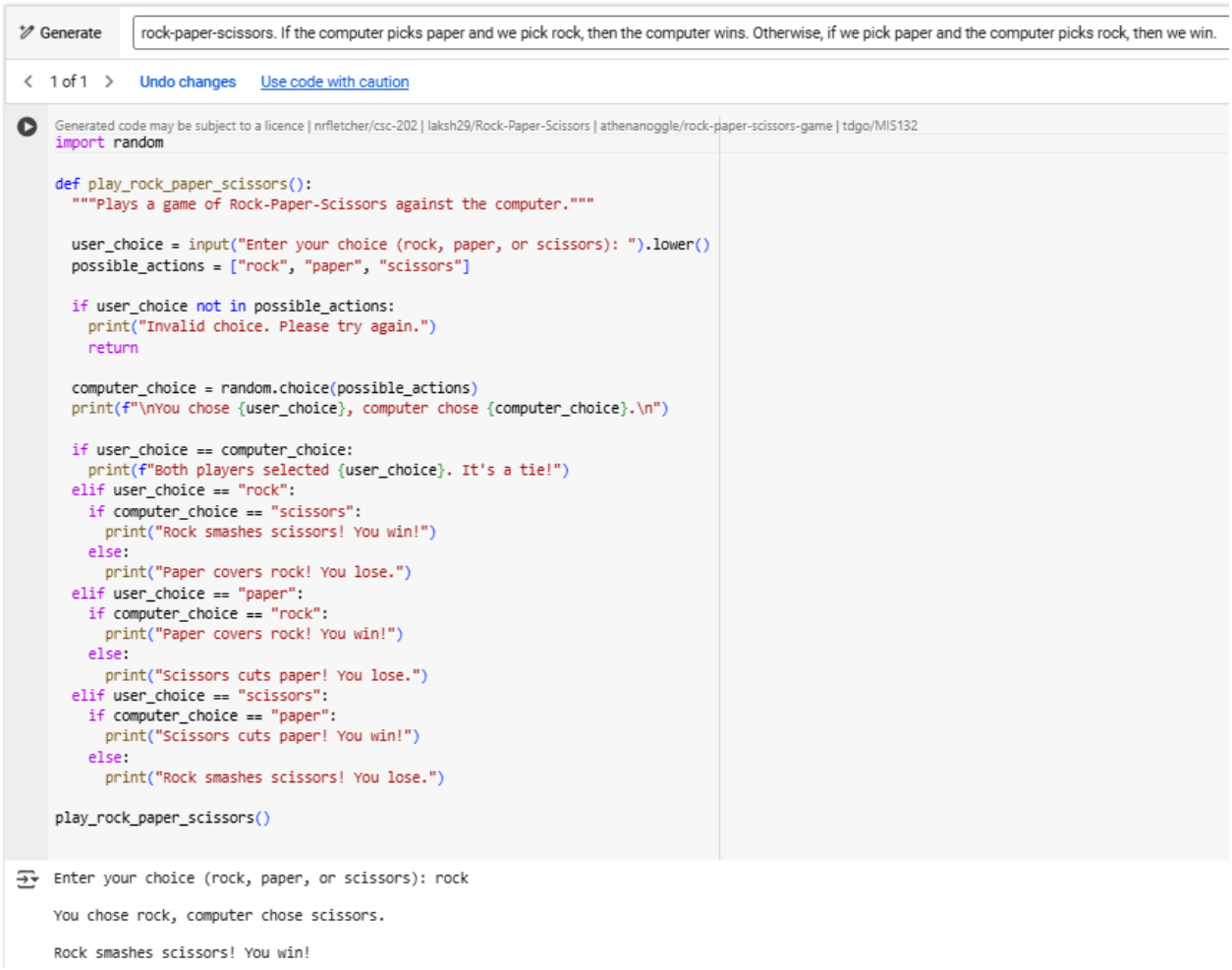
```
Enter student's name: Aakash
Enter marks in subject 1: 40
Enter marks in subject 2: 51
Enter marks in subject 3: 67

--- Report Card ---
Student Name: Aakash
Subject 1 Marks: 40.0
Subject 2 Marks: 51.0
Subject 3 Marks: 67.0
Total Marks: 158.0
Average Marks: 52.666666666666664
Grade: E
```

Using "if" conditions like this makes the AI understand the logic of grades, and it makes decisions based on our inputs.

2.2 Randomness and Conditions: Let the Games Begin

Another example of incorporating logic is when we play games with AI. Take a game like rock-paper-scissors. If the computer picks paper and we pick rock, then the computer wins. Otherwise, if we pick paper and the computer picks rock, then we win.



3 Real-World Applications: Beyond Theory

The examples that we saw in the previous chapters are not just abstract ideas. These ideas are applied every day in real life situations and are used to solve problems.

- **Timers and Counters**: Remember how we created a list where each number was one more than the previous? This is at the heart of how timers and counters work.
- **Decision Making**: Using 'if' conditions, we can get AI to make decisions such as to grade a report card or to declare who won in rock-paper-scissors.

4 Going a Bit Deeper: Playing with Text and Files

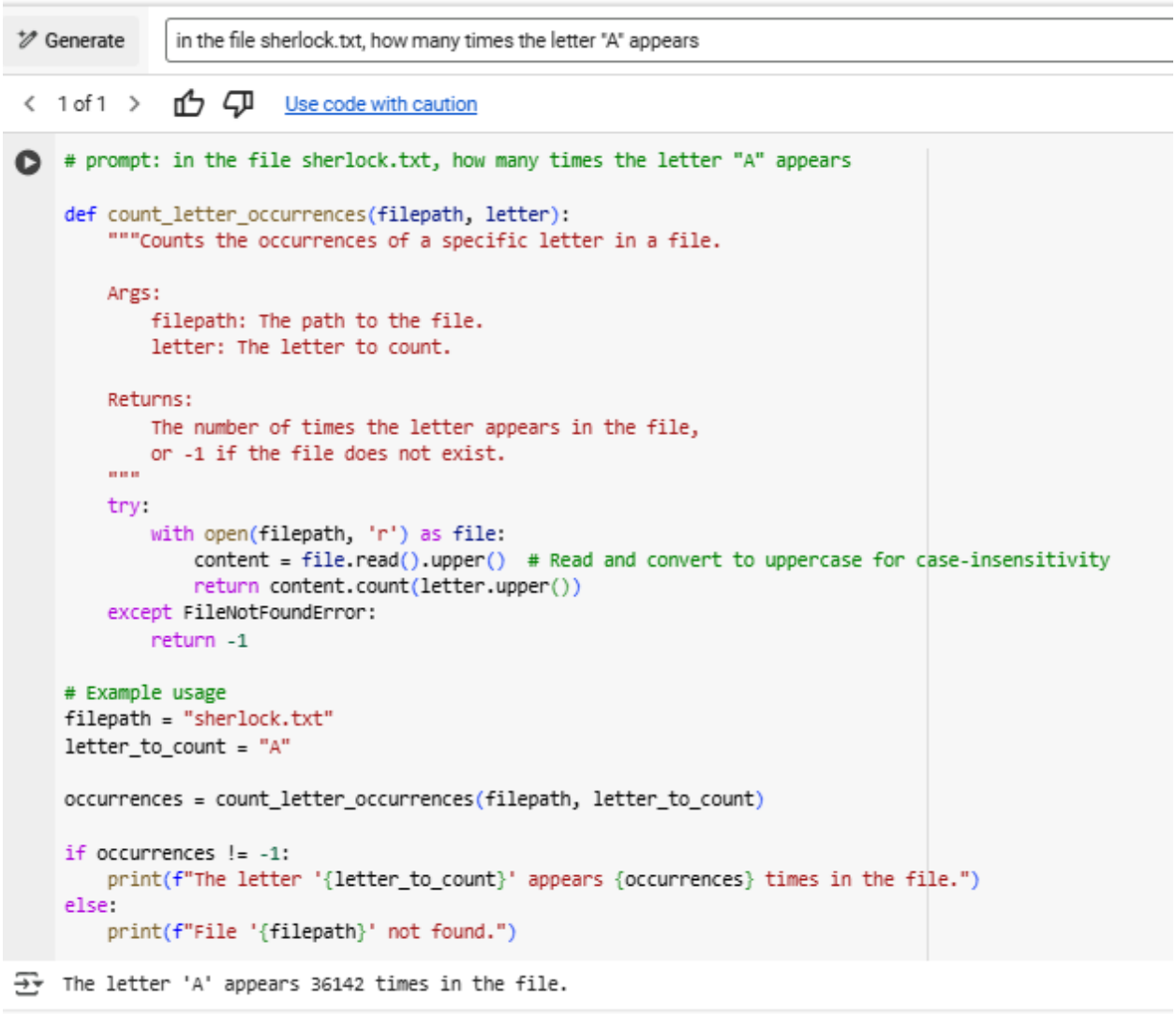
Let's look at some more complicated examples of prompting and coding.

4.1 Text Transformation

Imagine we want to transform a string (a word, or a sentence). Suppose we have a sentence "Hello World". We can ask the AI to change every letter in the sentence, by shifting it by three places in the alphabet.

4.2 Working with Files

Now, let's try and work with large text files. Imagine we have a very big book on the computer. We can ask the AI to open this book, and count how many times the letter "A" appears in the file.



Conclusion: Your Journey Begins Here

We have just scratched the surface of what's possible with AI. By learning how to write good prompts and understanding some basic programming and logic, you can unlock the power of Artificial Intelligence.