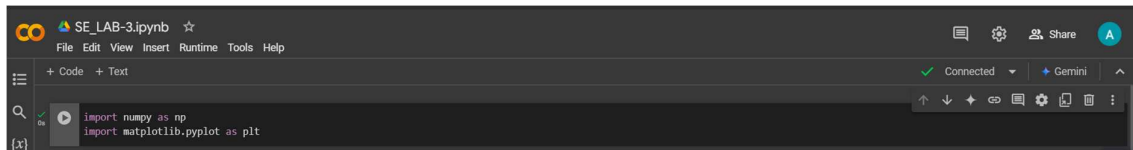


SE Lab Task-3

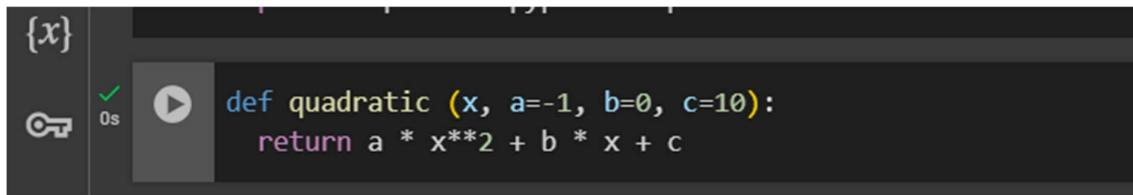
1. Develop weather modelling using the quadratic model using Waterfall.
2. Write about all the phases in Waterfall model

1. Importing libraries



```
SE_LAB-3.ipynb
File Edit View Insert Runtime Tools Help
+ Code + Text
import numpy as np
import matplotlib.pyplot as plt
```

2. Defining the quadratic expression



```
{x}
def quadratic (x, a=-1, b=0, c=10):
    return a * x**2 + b * x + c
```

3. Defining the stages of Waterfall model and implementing using pyplot library



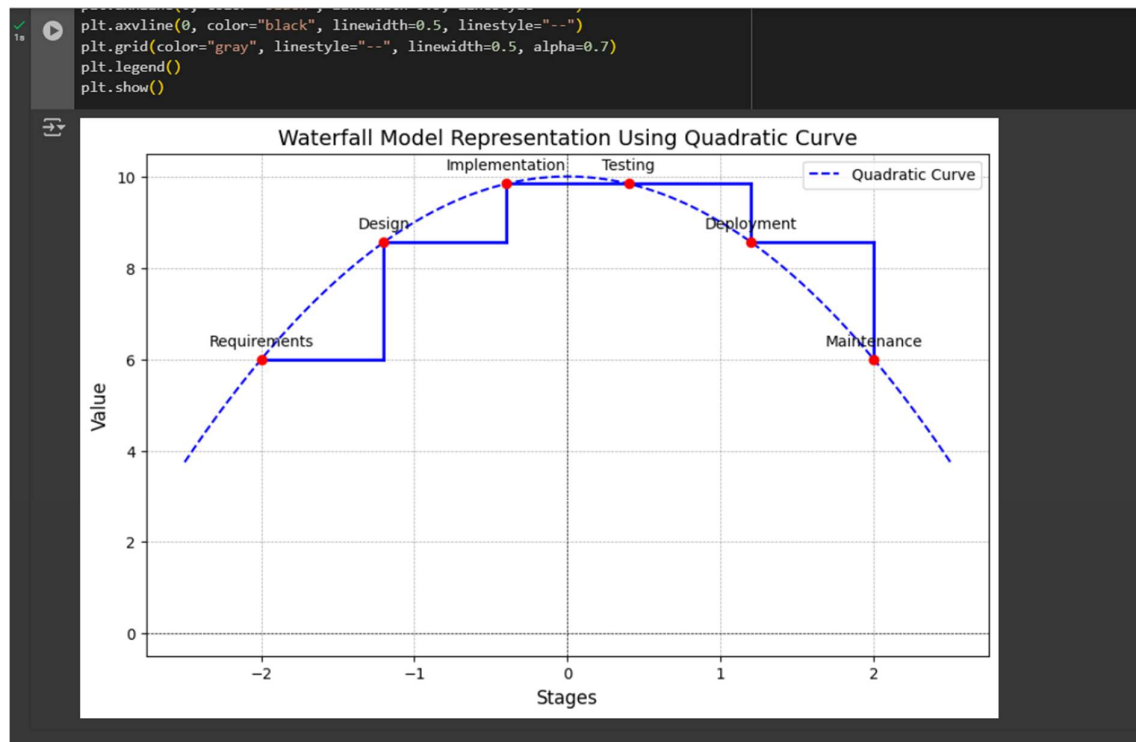
```
stages=["Requirements", "Design", "Implementation", "Testing", "Deployment", "Maintenance"]
x_positions = np.linspace(-2, 2, len(stages))
y_positions = quadratic(x_positions)

x_curve = np.linspace(-2.5, 2.5, 500)
y_curve = quadratic(x_curve)
plt.figure(figsize=(10, 6))
plt.plot(x_curve, y_curve, color='blue', linestyle="--", label="Quadratic Curve")

for i in range(len(stages)):
    if i > 0:
        plt.plot(
            [x_positions[i-1], x_positions[i]],
            [y_positions[i-1], y_positions[i]],
            color='blue',
            linewidth="2"
        )
    plt.plot(
        [x_positions[i], x_positions[i]],
        [y_positions[i-1], y_positions[i]],
        color='blue',
        linewidth="2"
    )
    plt.scatter(x_positions[i], y_positions[i], color="red", zorder=5)
    plt.text(x_positions[i], y_positions[i] + 0.3, stages[i], ha="center", fontsize=10)

plt.title("Waterfall Model Representation Using Quadratic Curve", fontsize=14)
plt.xlabel("Stages", fontsize = 12)
plt.ylabel("Value", fontsize = 12)
plt.axhline(0, color="black", linewidth=0.5, linestyle="--")
plt.axvline(0, color="black", linewidth=0.5, linestyle="--")
plt.grid(color="gray", linestyle="--", linewidth=0.5, alpha=0.7)
plt.legend()
plt.show()
```

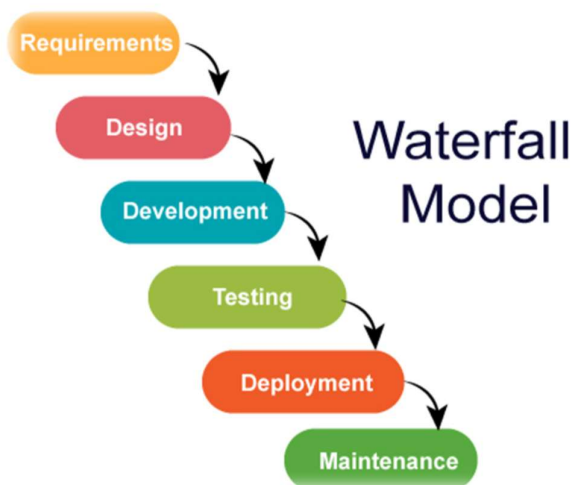
4. Implementation Output



5. Phases of waterfall model

Waterfall model: The Waterfall Model is a linear application development model that uses phases: When one phase ends, the next begins. The phases occur in sequence and if fault or error is found then the model does not allow developers to go back to previous steps instead start from the beginning of the phase.

The six phases of the waterfall model:-



Step 1: Collect Requirements

- Gather all the needs and wants for the system
- Write them down in a document

Step 2: Design the System

- Study the requirements document
- Plan the system's architecture and hardware needs

Step 3: Build the System

- Break down the system into smaller parts (units)
- Develop and test each unit

Step 4: Put it All Together

- Combine all the units into a complete system
- Test the entire system for errors

Step 5: Release the System

- Give the system to the customer or release it to the market

Step 6: Maintain the System

- Fix any problems that come up
- Make updates and improvements to the system

Advantages	Disadvantages
Easy to understand and follow.	Hard to make changes once the project starts.
The process is divided into clear steps.	Not good for complicated or risky projects.
Best for small projects with clear goals.	Can't handle changing needs well.

Simple to manage because it's step-by-step.	Testing happens only at the end.
--	----------------------------------

Works well when requirements don't change.	Users are involved only at the end.
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