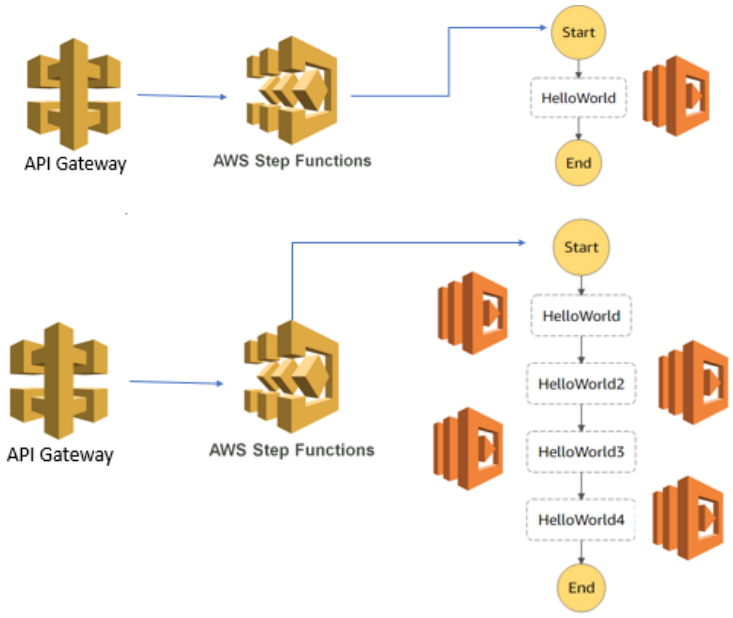
Goal:

Set up two different Step function workflows, one only contains one function. The other contains four functions. Check if cold start latencies accumulate or whether AWS Step Functions already optimizes the scheduler in a way that functions are pre-warmed.



Approach:

1. Creating the Lambda State Machines using this tutorial (https://docs.aws.amazon.com/step-functions/latest/dg/tutorial-creating-lambda-state-machine.html)
    a. Implement each function to wait a certain time before execution to simulate actual workload such as a dataset query (the average execution duration was 200ms in this experiement)
2. Creating a Step Functions API Using API Gateway (https://docs.aws.amazon.com/step-functions/latest/dg/tutorial-api-gateway.html)

Challenges:

- API Gateway is only able to invoke the state machine since Step Functions is asynchronous and immediately responds withouth execution result (https://docs.aws.amazon.com/step-functions/latest/apireference/API_StartExecution.html#API_StartExecution_RequestSyntax)

Result:

- Using Apache JMeter to send 10 almost concurrent requests in 5 period with 5 seconds pause between
- Solution: Use AWS CLI to fetch Step Function execution history (https://docs.aws.amazon.com/cli/latest/reference/stepfunctions/list-executions.html)
    - aws stepfunctions list-executions --state-machine-arn arn:aws:states:us-east-1:520443335433:stateMachine:Helloworld --max-items 50
    - Import JSON to Excel and calculate cold start latencies in both cases

	Single Step	Multi Step
Avg. cold duration	456,90ms	3339,90ms
Avg. warm duration	80,72ms	335,95ms