Lab 3 – Monitoring Lambda

1. Log into the AWS console and verify that the N. Virginia region is selected
2. In the services search text box, type in **Lambda**
3. Click **Lambda**
4. Click **Functions**
   If you have created Lambda functions in this region, they will be shown here.
5. Click **Training**
6. Click the **Monitor** tab
7. Review the charts available here, most importantly:
    a. Invocations - How many times has our Lambda function run?
    b. Duration - How long does the function take to run? If we can reduce the duration, the cost will be reduced.
    c. Throttles - If we see throttles, that means that we are running the maximum concurrent Lambda functions, and new requests are being slowed down. This could be do to a limit that you have set.
    d. Total concurrent executions - How many instances of this Lambda function are being executed at once?
8. Click **View CluodWatch Logs**
    a. This will take us to the CloudWatch Console.
    b. Click **Log groups**
        i. Each Lambda Function will have it's own Log Group
        By default, these logs never expire. You will pay to store these logs indefinitely.
        ii. Click the check box to the left of the log group for the **Training** function
        iii. Click **Actions > Edit retention setting(s)**
            1. Expire events after: 2 months (60 days)
            2. Click **Save**
    c. Click the name of the log group for the Training function
        i. Scroll down, and notice the list of **Log streams**
        Each time you deploy your lambda function with changes to it, this starts a new log stream.
        ii. Click the most recent log stream
        iii. Here you can see all the actions that have been taken. The oldest events are at the top of the list.
            1. Expand a few of the log events and take a closer look.
            Imagine your Lambda function is being launched thousands of times. Reviewing these Log events would be nearly impossible.

d. Click **Log groups**
    i. Click the check box to the left of the log group for the **Training** function
    ii. Click **View in Logs Insights**
    iii. Notice the name of the log stream is shown.
    iv. Click **Run query**
        1. This will submit the default query
        2. Now it is centralizing all of this information and returning it to a single point of view.
    v. On the right, click the **Queries** folder.
        1. Expand Lambda
        2. Notice some of the pre-built queries.
        3. Expand **View latency statistics for 5-minute intervals**
            a. Click **Apply**
            b. Notice that the query in the middle of the screen was changed.
            c. Click **Run query**
    vi. Click the text box that says *Select up to 50 log groups*
        1. We can run these queries across many log groups at once. This allows us to quickly query multiple Lambda functions simultaneously.
e. Close the CloudWatch browser tab to return to the Lambda console.

9. Click the **Configuration** tab
10. Click **Monitoring and Operations tools**
11. Additional monitoring tools: Click **Edit**
    a. CloudWatch Lambda Insights:
    This service is available at an additional charge.
    CloudWatch Lambda Insights monitors Lambda functions, collecting and summarizing system metrics (CPU, memory, disk, network) and diagnostic data (cold starts, worker shutdowns) to swiftly identify and resolve issues with Lambda functions.
    b. Amazon CodeGuru Profiler:
    Amazon CodeGuru Profiler is a developer tool that helps optimize performance and reduce operational costs of applications running on AWS. It analyzes application's runtime behavior, identifies performance bottlenecks, and provides recommendations for improvement.