S3 File Processing with Lambda and Java

Assignment

Create a file processing system that automatically processes text files uploaded to an S3 bucket using a Java Lambda function.

Requirements:

1. S3 Bucket

- Create an S3 bucket: `file-processing-bucket-<your-name>`
- Configure an event notification to trigger Lambda on `.txt` file uploads

2. Java Lambda Function

- **Function Name**: `TextFileProcessor`
- **Runtime**: Java 17
- **Trigger**: S3 Event (ObjectCreated)
- **Functionality**:
  - Read the uploaded text file from S3
  - Count: lines, words, and characters
  - Extract the first 100 characters as a preview
  - Store processing results in a DynamoDB table

3. DynamoDB Table

- **Table Name**: `FileProcessingResults`
- **Partition Key**: `fileName` (String)
- **Attributes**: `lineCount`, `wordCount`, `charCount`, `preview`, `processedDate`

File Format to Process:

```
Sample text file content
with multiple lines
for testing the processor
```

Expected Processing Result: JSON

```
{
  "fileName": "sample.txt",
  "lineCount": 3,
  "wordCount": 12,
  "charCount": 58,
  "preview": "Sample text file content with multiple lines for testing...",
  "processedDate": "2024-01-15T10:30:00Z"
}
```

Implementation Tasks:

1. **Create S3 bucket** with event notification
2. **Create DynamoDB table**
3. **Write Java Lambda function** that:
    - Handles S3 trigger event
    - Reads the text file from S3
    - Processes the content
    - Saves results to DynamoDB
4. **Configure IAM roles** with appropriate permissions

Success Criteria:

- Upload a `.txt` file to S3
- Lambda automatically triggers and processes the file
- Processing results are stored in DynamoDB
- No errors in CloudWatch logs

Deliverables:

1. Java source code for Lambda function
2. S3 event configuration
3. IAM role policies
4. Screenshots of:
    - Uploaded file in S3
    - Processed results in DynamoDB
    - Lambda execution logs

Assessment Focus:

- S3 event configuration
- Java Lambda development
- S3 file reading in Java
- DynamoDB operations
- Error handling