School of Information Technology and Engineering (SITE)

Master of Computer Application (MCA)

Course Project Report

IMAGE PROCESSING USING PYTHON AND FLASK ON AWS

Submitted for the Course ITA 6009 : Cloud Computing

Offered by Dr. R. K. NADESH during WINTER 2018-2019

By

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APRIL 2019

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Project Title : **IMAGE PROCESSING USING PYTHON AND FLASK ON AWS**

1. Introduction

1.1 Background

We are implementing an application made up of python and flask on CLOUD 9 in AWS.It will basically run on deep learning algorithm. The AWS Cloud lets you build applications quickly and cost effectively - you pay for the resources you need and can quickly add more resources when you need them.

1.2 Problem Statement

You are given a lot of flexibility in AWS to configure and build your applications the way you want. Given that you control your resources, security in AWS is a shared responsibility between AWS and you. AWS will provide secure facilities and building blocks for your application. AWS also provides guidance, and tools that can help you operate securely.

For example, if you are using EC2, it is your responsibility to take advantage of features such as Security Groups (firewall), Private Subnets (to provide network isolation) and encryption options to build secure applications. You are also responsible for keeping the operating system and application stack patched on your server.

If you use AWS managed services like RDS, you still have to make security decisions, but operational tasks like patching the Operating System and SQL engine can be done automatically on your behalf. When using APIs like Amazon S3 API, the underlying infrastructure and maintenance is fully abstracted from you and you are only responsible for calling the API and configuring your access and encryption policies.

2. Overview and Planning

2.1 Proposed System Overview

An AWS service that can take in a declarative document called a 'template' and use it to provision AWS resources on your behalf so you don't have to. We used this to create a VPC to the specifications needed for the course.

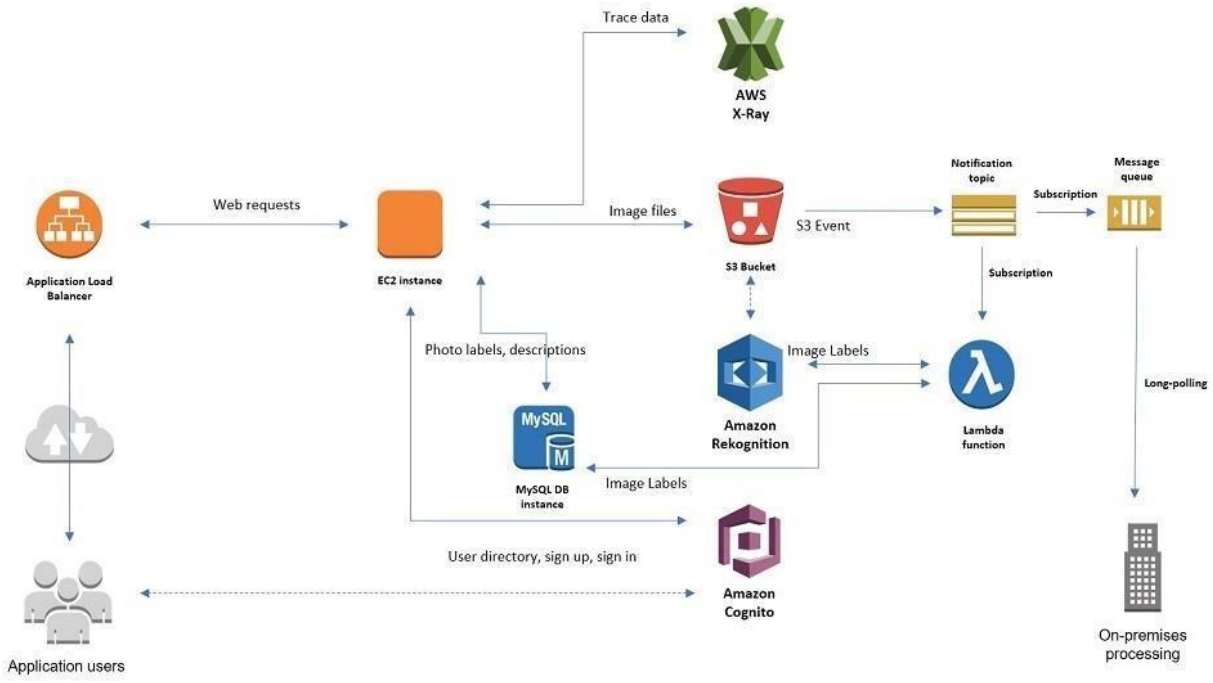
2.2 Challenges

Building the first component of the course project. AWS Cloud9 is a cloud-based IDE that lets you write, run, and debug your code with just a browser.

2.3 Assumptions

The application is deployed on an Amazon EC2 instance with an Application Load Balancer sitting in front of the instance to direct user requests to the instance. Amazon Cognito is used to sign up/sign in users for the application.

2.4 Architecture Specifications



2.5 Hardware Requirements

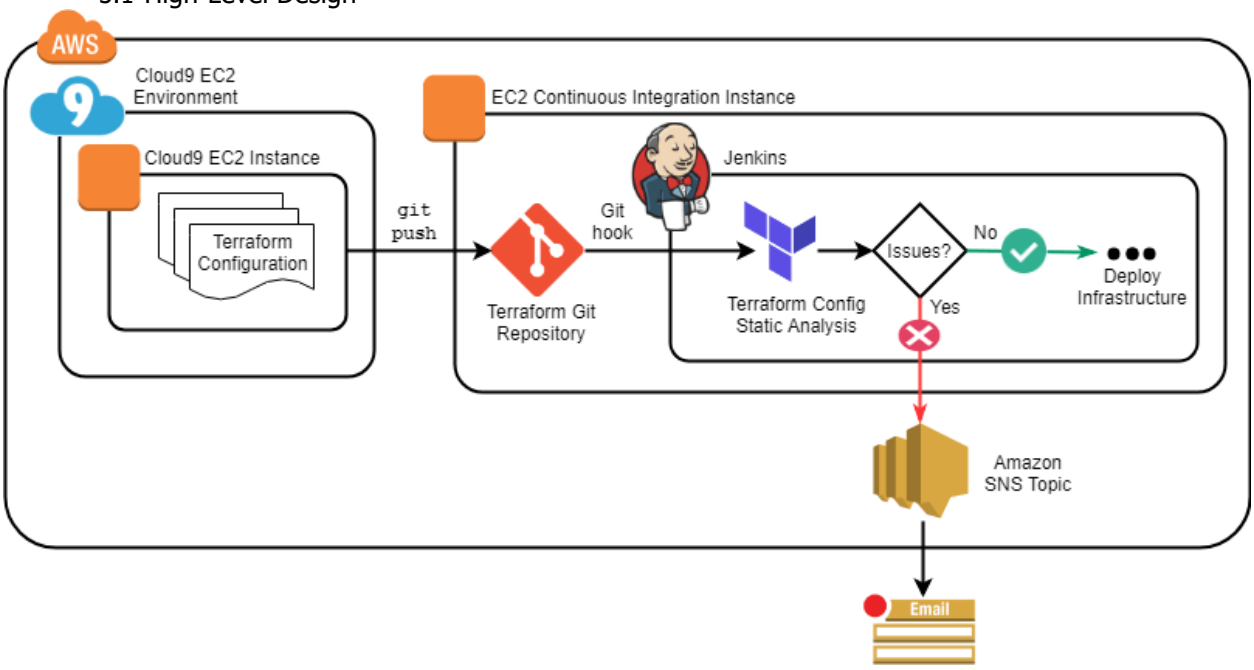
1) PC OR LAPTOP WITH I3 OR ABOVE VERSION PROCESSOR
2) WINDOWS 7 OR ABOVE
3) RAM MININUM 4 GB

2.6 Software Requirements

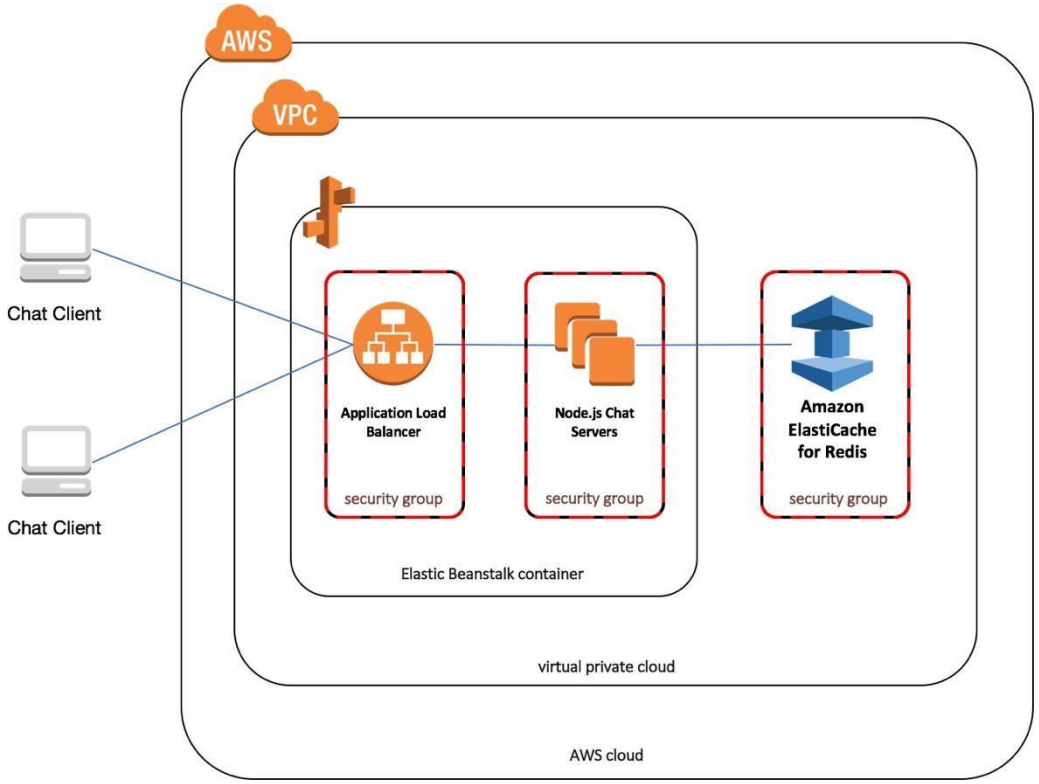
1) AWS ACCOUNT
2) GOOD INTERNET CONNECTION
3) PUTTY INSTALLED

3. System Design

3.1 High-Level Design



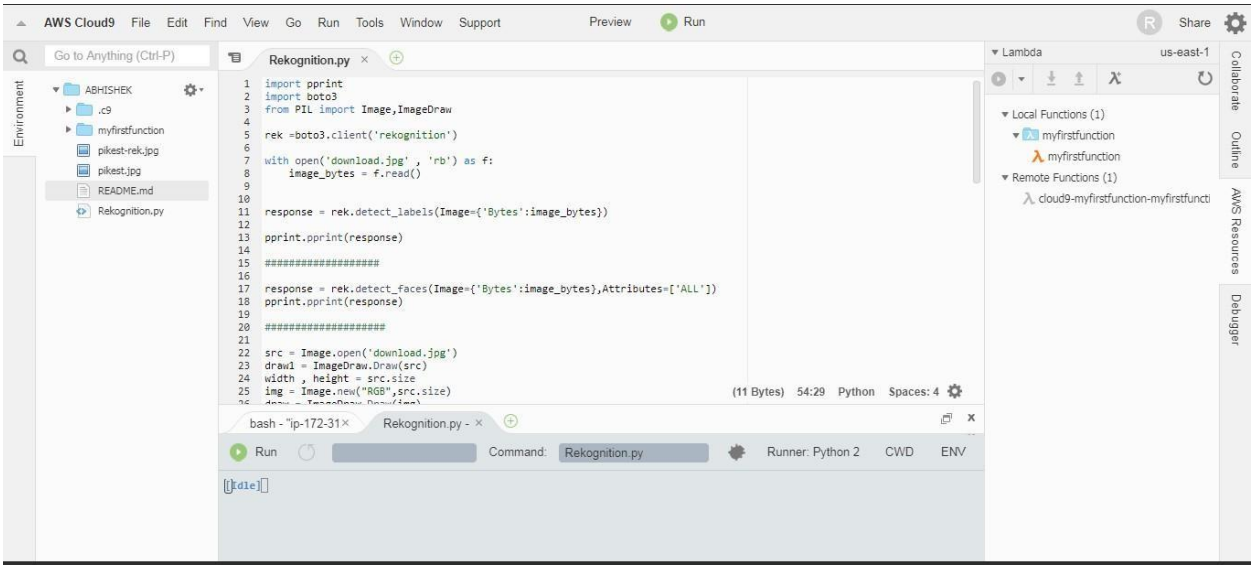
3.2 Low-Level Design

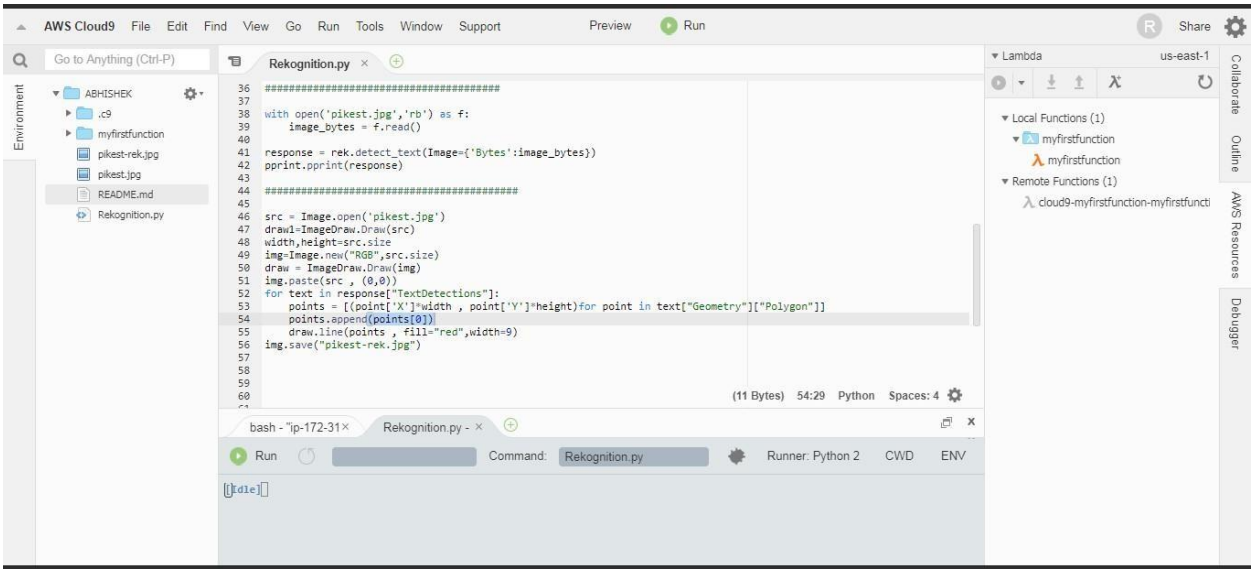


4. Implementation (Code)

```
import pprint
import boto3
from PIL import Image,ImageDraw

rek =boto3.client('rekognition')

with open('download.jpg' , 'rb') as f:
        image_bytes = f.read()


response = rek.detect_labels(Image={'Bytes':image_bytes})

pprint.pprint(response)

###################

response = rek.detect_faces(Image={'Bytes':image_bytes},Attributes=['ALL'])
pprint.pprint(response)

####################

src = Image.open('download.jpg')
draw1 = ImageDraw.Draw(src)
width , height = src.size
img = Image.new("RGB",src.size)
draw = ImageDraw.Draw(img)
img.paste(src , (0,0))
for face in response["FaceDetails"]:
    for point in face["Landmarks"]:
        x=point["X"] * width
        y=point["Y"] * height
        r = 5
        draw.ellipse((x-r,y-r,x+r,y+r),fill="red")
img.save('download-rek.jpg')

#######################################

with open('pikest.jpg','rb') as f:
    image_bytes = f.read()

response = rek.detect_text(Image={'Bytes':image_bytes})
pprint.pprint(response)

#########################################

src = Image.open('pikest.jpg')
draw1=ImageDraw.Draw(src)
width,height=src.size
img=Image.new("RGB",src.size)
draw = ImageDraw.Draw(img)
img.paste(src , (0,0))
```

```
for text in response["TextDetections"]:
    points = [(point['X']*width , point['Y']*height)for point in text["Geometry"]["Polygon"]]
    points.append(points[0])
    draw.line(points , fill="red",width=9)
img.save("pikest-rek.jpg")
```





```
import csv
import boto3
with open('credentials.csv' , 'r') as input:
    next(input)
    reader = csv.reader(input)
    for line in reader:
        access_key_id = line[2]
        secret_access_key = line[3]


photo = 'mix.jpg'
client = boto3.client('rekognition' , aws_access_key_id = access_key_id , aws_secret_access_key =
secret_access_key)
with open(photo , 'rb') as source_image:
    source_bytes = source_image.read()


response =
client.recognize_celebrities(Image={'S3Object':{'Bucket':'umangpincha','Name':photo}} )

for key, value in response.items():
    if  key=='CelebrityFaces':
        for people in value:
            print (people)
```

Conclusion And Future Developments

Machine learning is undoubtedly the biggest topic of discussion in the digital world right now. The things we had only imagined in science fiction movies are now happening in real life and we are very close to achieving a state where machine learning becomes an integral part of everyday life. Newer uses of machine learning and AI are coming into the picture and businesses are making huge investments in research and development to make machine learning work for them.According to Forbes, "machine learning patents grew at a 34% Compound Annual Growth Rate (CAGR) between 2013 and 2017, the third-fastest growing category of all patents granted." In this article, we shall discuss some of the top machine learning trends for 2018 and peek into the future of machine learning.

References

1) **Pythonprogramming.net**
2) **Youtube.com**
3) **www.tensorflow.org**
4) **www.learncodeonline.com**

Any other related information, you want to add.

Data analysis is a process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, informing conclusions, and supporting decision-making.The data are necessary as inputs to the analysis, which is specified based upon the requirements of those directing the analysis or customers (who will use the finished product of the analysis). The general type of entity upon which the data will be collected is referred to as an experimental unit (e.g., a person or population of people). Specific variables regarding a population (e.g., age and income) may be specified and obtained. Data may be numerical or categorical (i.e., a text label for numbers).

For Evaluation only

Status : ACCEPTED / REJECTED

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(Deemed to be University under section 3 of UGC Act, 1956)

M.C.A WINTER 2018-2019
ITA 6009: Cloud Computing
Course Project-Design Review- II
Evaluation Sheet
(Review Date 27.02.2019)

Title:

Team Name

Project Team

S.No	Register Number	Student Name	Signature	Guided By

Team Member(s) Contribution and Performance Assessment

Components	Student 1	Student 2	Student 3
Understanding Background & Problem Statement (05)			
Overview and Planning (05)			
System Design, Implementation (15)			
Documentation & Q&A (05)			
Total (30)			

Expectation for Next Reviews	Comments

Name & Signature of the Evaluator