

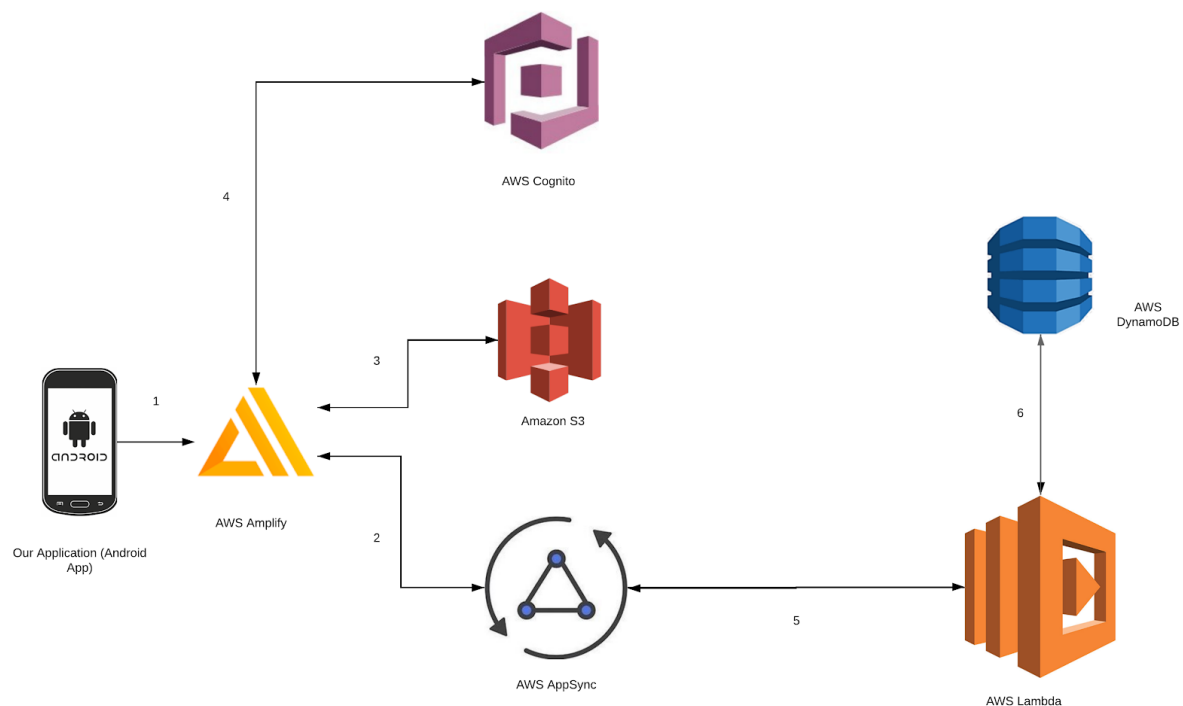
Employee Tracker

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Introduction

We were looking to do a program that could efficiently utilize multiple Cloud based services and different API's while also keeping the app design relatively simple while being easy to use and understand for all types of users.

“Employee Tracker” is an application that allows employers to keep track of their employee information and data in an AWS cloud system. It can be tailored to whatever certain companies need. For example if a new manager is working at a company, he can use the app to quickly learn employee's names and faces while also being able to find out relevant information about them like their position in a fast, efficient manner.



Summary

The app will utilize multiple Cloud based applications to deliver its services in a concise manner. Current the app using the following services

AWS Amplify

AWS Amplify helps with app development that can easily be integrated with AWS services. It is a set of libraries, components and CLI's that the majority of our application backend is built on..

AWS Cognito

Cognito is used on the backend for user authentication. All basic user information is stored on it and it allows users to log in with alternative platforms (e.g. Google). It allows us to add user sign up, sign ins and access control to our app easily

AWS AppSync

AppSync is a service that allows the creation of flexible API to securely access and combine data from multiple data sources. It helped us build a scalable application and assists with functionality with AWS Lambda

AWS Lambda

Lambda will be used to help run code from the cloud on the backend of the application. It will be used to communicate and interact with the other AWS services and connect to the API.

AWS DynamoDB

DynamoDB is a solid document database that delivers incredible performance at any scale. It works together with Lambda to retrieve information and then returns the data back to the user.

AWS S3

Amazon Simple storage service is a scalable object storage system. It lets us manage objects at scale through API requests and store & retrieve objects for the application

Android Sdk

Used in development of our mobile app which is written in java.

App Interactions

1.AWS Cognito is used to authenticate users via a predefined policy which is assigned to Authenticated users, so in this way only authenticated users will be able to access(read/write/delete) data available on our application.

2. AWS Amplify integrates all the AWS clients into the app

3. AWS S3 is used to store large files like images for our application.

4. Appsync helps Amplify connect to Lambda and DynamoDB

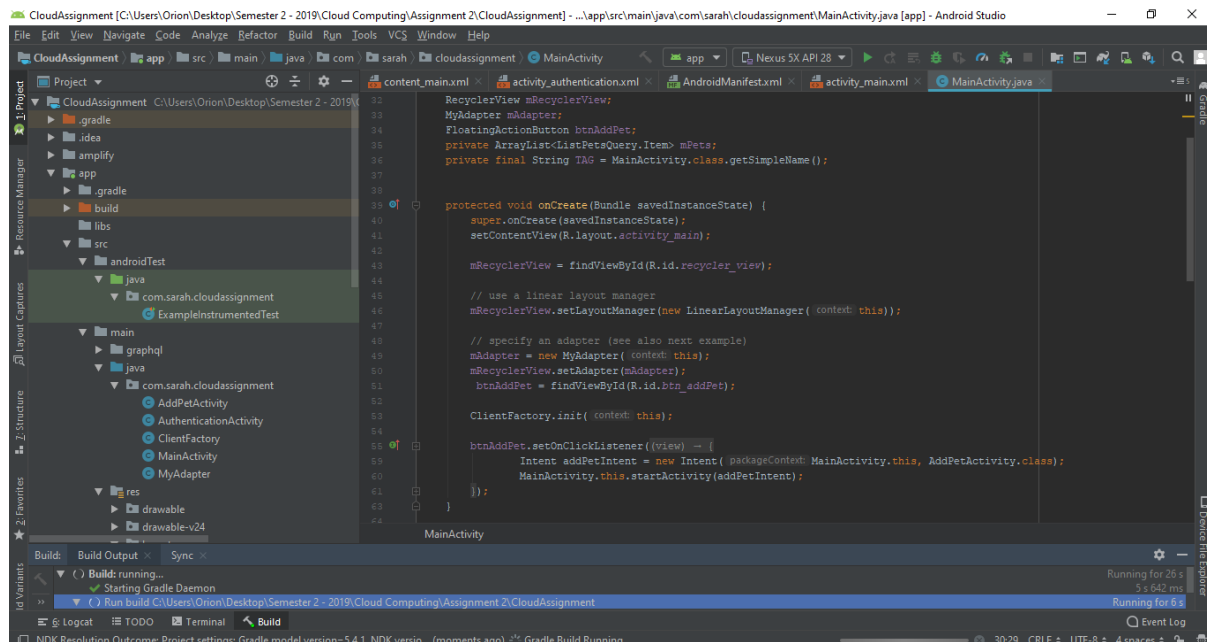
5. Lambda helps us run code for virtually any type of application/backend service with zero administration. We can set up our code to automatically trigger from other AWS services or call them directly from our mobile app.

6.DynamoDB is used to keep track of each employee data such as name,description, profile photo. All these data are stored in DynamoDB, but the images are stored in s3 so DynamoDB just keeps the name of each image assigned to each employee.

Implementation

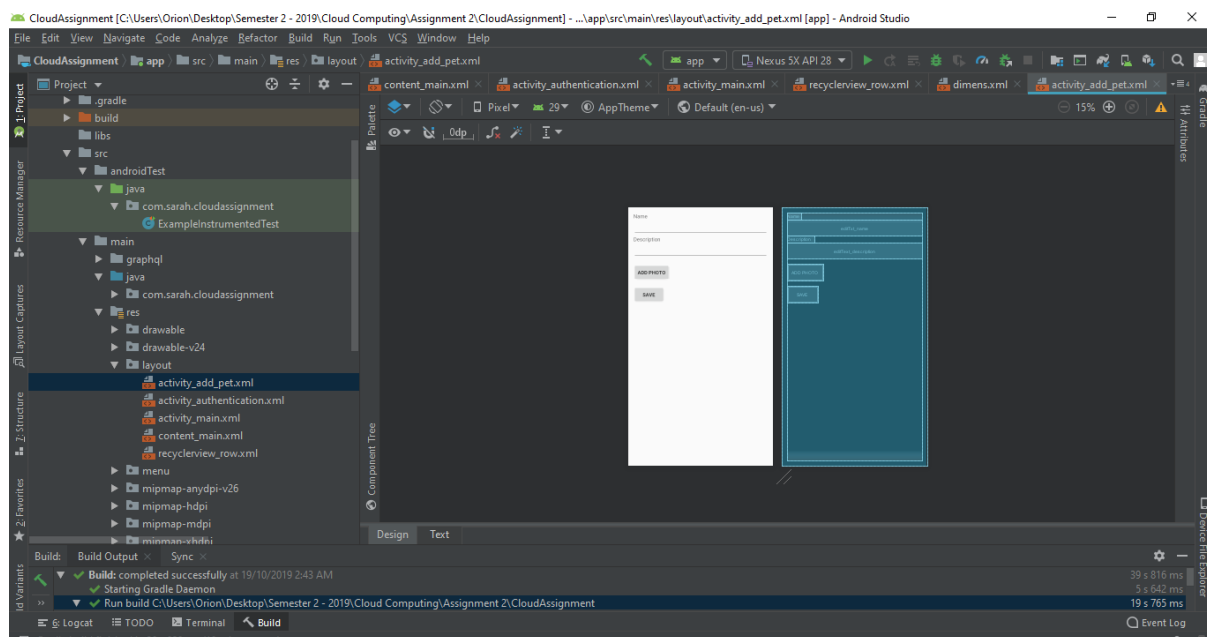
Android Studio Code

-The majority of the app was coded in Android Studio using Java, It the application to use for android programming



Android Studio Display

-Android studio shows users a preview of what the app will look like in its layout xml files



Amplify CLI

-Amplify is used through a command line interface and requires you to go to the root directory of your android app

-Amplify pushes data to the Cloud

```
"amplify publish" will build all your local backend and frontend resources (if you have hosting category added) and provision it in the cloud

Pro tip:
Try "amplify add api" to create a backend API and then "amplify publish" to deploy everything

EmployeeApp>amplify push

Current Environment: adnroidapp

| Category | Resource name | Operation | Provider plugin |
|-----|-----|-----|-----|
| Api | EmployeeAmplifyAndroid | Update | awscloudformation |
| Auth | employeeapp203c0271 | No Change | awscloudformation |
? Are you sure you want to continue? Yes

The following types do not have '@auth' enabled. Consider using @auth with @model
- Employee
Learn more about @auth here: https://aws-amplify.github.io/docs/cli-toolchain/graphql#auth

GraphQL schema compiled successfully.

Edit your schema at (C:\Users\sarah\Documents\Programming\Android projects\EmployeeApp\amplify\backend\api\EmployeeAmplifyAndroid\schema.graphql or place .graphql files in a directory at C:\Users\sarah\Documents\Programming\Android projects\EmployeeApp\amplify\backend\api\EmployeeAmplifyAndroid\schema)
? Please select from one of the below mentioned services Content (Images, audio, video, etc.)
? Please provide a friendly name for your resource that will be used to label this category in the project: MyEmployeeAppResources
```

-Viewing the status

```
C:\Windows\System32\cmd.exe

GraphQL schema compiled successfully.

Edit your schema at (C:\Users\sarah\Documents\Programming\Android projects\EmployeeApp\amplify\backend\api\EmployeeAmplifyAndroid\schema.graphql or place .graphql files in a directory at C:\Users\sarah\Documents\Programming\Android projects\EmployeeApp\amplify\backend\api\EmployeeAmplifyAndroid\schema)
? Please select from one of the below mentioned services Content (Images, audio, video, etc.)
? Please provide a friendly name for your resource that will be used to label this category in the project: MyEmployeeAppResources
? Please provide bucket name: 
? Who should have access: Auth users only
? What kind of access do you want for Authenticated users? create/update, read, delete
? Do you want to add a Lambda Trigger for your S3 Bucket? Yes
? Select from the following options (Use arrow keys)
> Choose an existing function from the project
  Create a new function

EmployeeApp>amplify status

Current Environment: adnroidapp

| Category | Resource name | Operation | Provider plugin |
|-----|-----|-----|-----|
| Api | EmployeeAmplifyAndroid | Update | awscloudformation |
| Auth | employeeapp203c0271 | No Change | awscloudformation |

GraphQL endpoint: https://ko4cyth6ejbn3gx6act3ycx3ca.appsync-api.us-east-1.amazonaws.com/graphql
```

-Adding storage on the S3 bucket through Amplify

```
\EmployeeApp>amplify add storage
? Please select from one of the below mentioned services Content (Images, audio, video, etc.)
? Please provide a friendly name for your resource that will be used to label this category in the project: MyEmployeeAppResources
? Please provide bucket name: employeeapp-adnroidapp-20191815151532-deployment
? Who should have access: Auth users only
? What kind of access do you want for Authenticated users? create/update, read, delete
? Do you want to add a Lambda Trigger for your S3 Bucket? No
Successfully added resource MyEmployeeAppResources locally

Some next steps:
"amplify push" builds all of your local backend resources and provisions them in the cloud
"amplify publish" builds all of your local backend and front-end resources (if you added hosting category) and provisions them in the cloud

\EmployeeApp>amplify push

Current Environment: adnroidapp
```

Category	Resource name	Operation	Provider plugin
Storage	MyEmployeeAppResources	Create	awscloudformation
Api	EmployeeAmplifyAndroid	Update	awscloudformation
Auth	employeeapp203c0271	No Change	awscloudformation

AppSync:

-Acknowledgement of the data source in AppSync

AWS AppSync

×

APIs

EmployeeAmplifyAndroid-adnroidapp

Schema

Data Sources

Functions

Queries

Settings

Monitoring

AWS AppSync > EmployeeAmplifyAndroid-adnroidapp > Data Sources

Data Sources

Connect existing AWS resources to your API. Info

Data Sources

Edit

Delete

Create data source

< 1 >

⚙



	Name	Type	Resource
<input type="radio"/>	EmployeeTable	AMAZON_DYNAMODB	Employee-udq6ffkdrvedhpf53ab6rdsd3y-adnroidapp

DynamoDB:

-Table of database in DynamoDB

Employee-udq6ffkdrvedhpf53ab6rdsd3y-adnroidapp [Close](#)

Overview **Items** Metrics Alarms Capacity Indexes Global Tables Backups [More](#) ▾

[Create item](#) Actions ▾  

Scan: [Table] Employee-udq6ffkdrvedhpf53ab6rdsd3y-ad... Viewing 1 to 4 items

Scan ▾ [Table] Employee-udq6ffkdrvedhpf53ab6rdsd3y-adnroidapp: id ▾ ^

+ Add filter

Start search

__typename ▾	createdAt ▾	description ▾	name ▾
Head of Developers	2019-10-20T03:17:48.533Z	Front-end Developer	Alex
Employee	2019-10-20T03:19:20.955Z	Customer Service Manager	Sam
Employee	2019-10-20T03:21:40.981Z	Sales Manager	Zahra
Employee	2019-10-20T03:14:18.835Z	IT Intern	Julia

Lambda:



-User pool code executing in Lambda


employeeapp-adnroidapp-... Throttle Qualifiers ▾ Actions ▾ [Select a test event](#) ▾ Test Save

Configuration Monitoring


▼ Designer


[Go back to application employeeapp-adnroidapp-20191018154932-authemployeeapp203c0271-BMSR0ZOYTW32](#)

  employeeapp-adnroidapp-201910-UserPoolClientLambda-15W14Z1F0EV3O

 Layers (0)

+ Add trigger

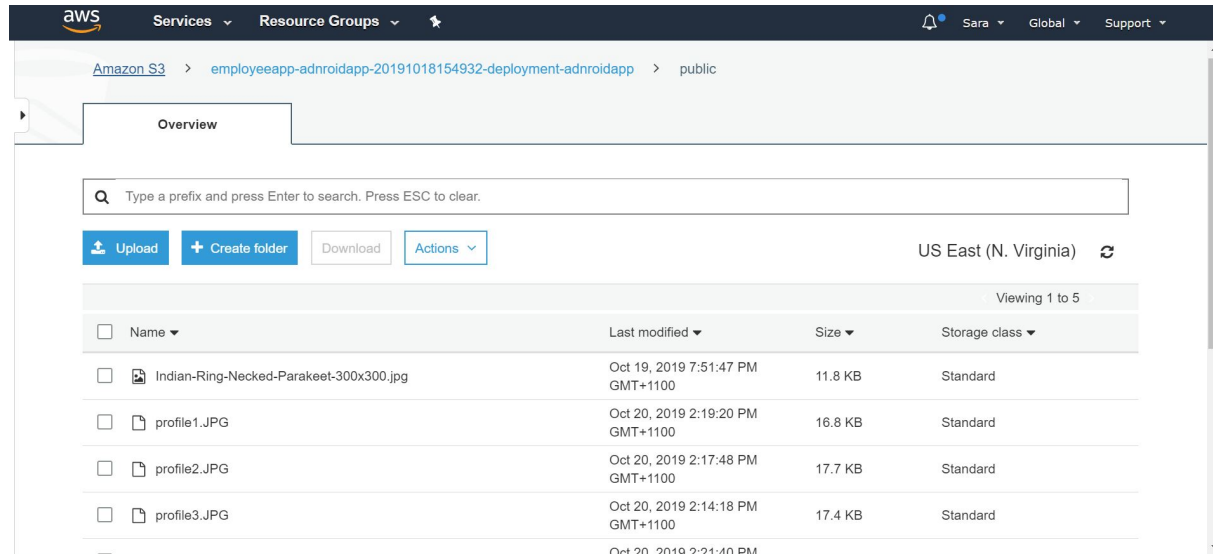
 Amazon CloudWatch Logs

 Amazon Cognito User Pools

Resources that the function's role has access to appear here

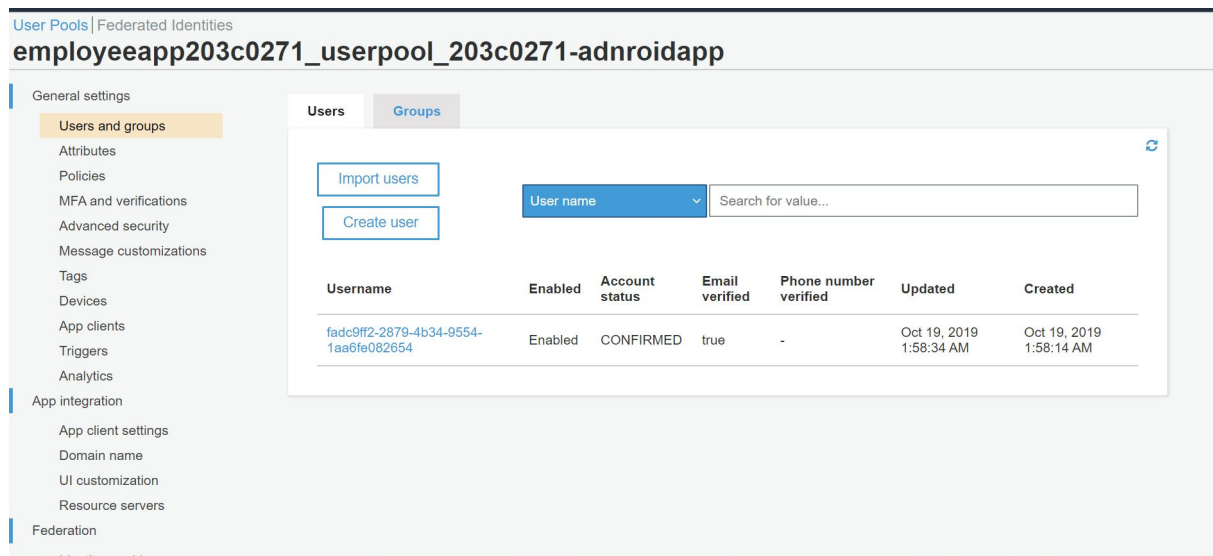
S3:

-Images from the upload stored in S3 bucket

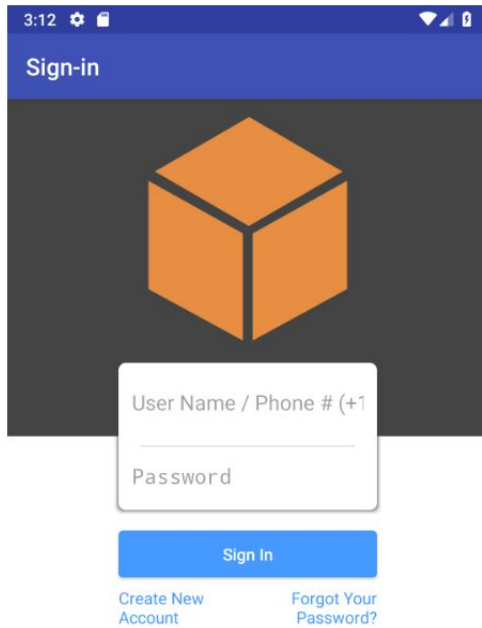


Cognito:

-User pool information generated by Cognito. Only authenticated users can edit and read the data in our mobile app.



1. Sign in page



A mobile app sign-in screen. At the top, a blue header bar contains the text "Sign-in". Below the header is a large orange 3D cube icon. Underneath the icon is a white login form with two input fields: "User Name / Phone # (+1)" and "Password". Below the form is a blue "Sign In" button. At the bottom, there are two links: "Create New Account" and "Forgot Your Password?". The status bar at the top shows the time 3:12 and various icons.

3:12

Sign-in

User Name / Phone # (+1)

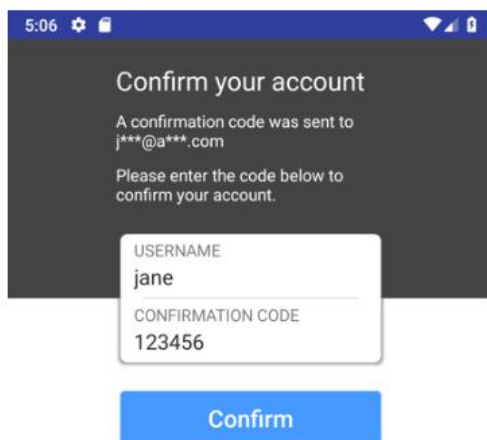
Password

Sign In

Create New Account

Forgot Your Password?

2. Confirmation page



A mobile app confirmation screen. The header bar is blue with the time 5:06. The main title is "Confirm your account". Below it, text states: "A confirmation code was sent to j***@a***.com" and "Please enter the code below to confirm your account." There is a white form with two fields: "USERNAME" with the value "jane" and "CONFIRMATION CODE" with the value "123456". Below the form is a blue "Confirm" button.

5:06

Confirm your account

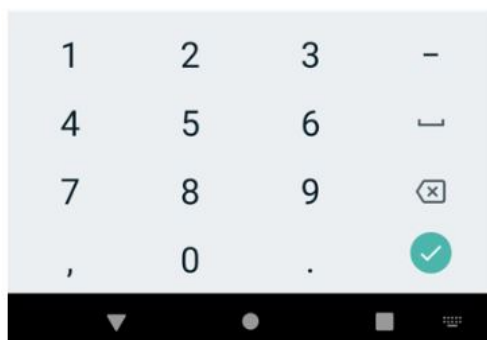
A confirmation code was sent to j***@a***.com

Please enter the code below to confirm your account.

USERNAME
jane

CONFIRMATION CODE
123456

Confirm



A numeric keypad interface. It consists of a 4x4 grid of buttons. The first three columns contain digits 1-9, 0, and a decimal point. The fourth column contains a minus sign, an equals sign, a backspace icon, and a green checkmark icon. The status bar at the bottom shows various icons.

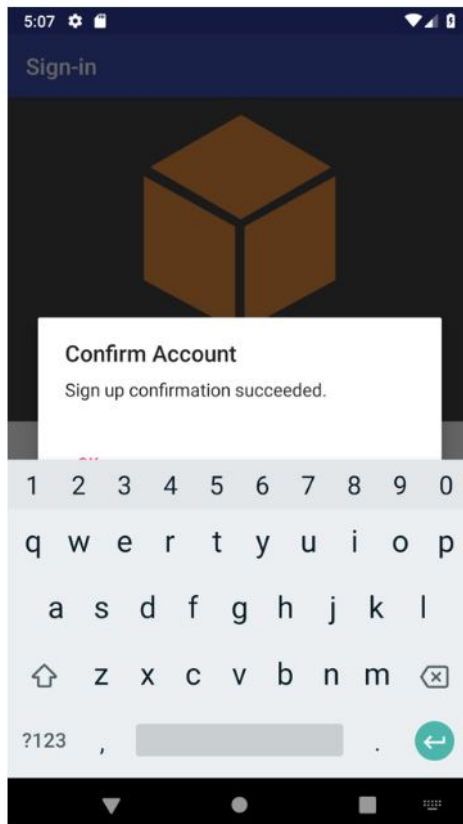
1 2 3 -

4 5 6 =

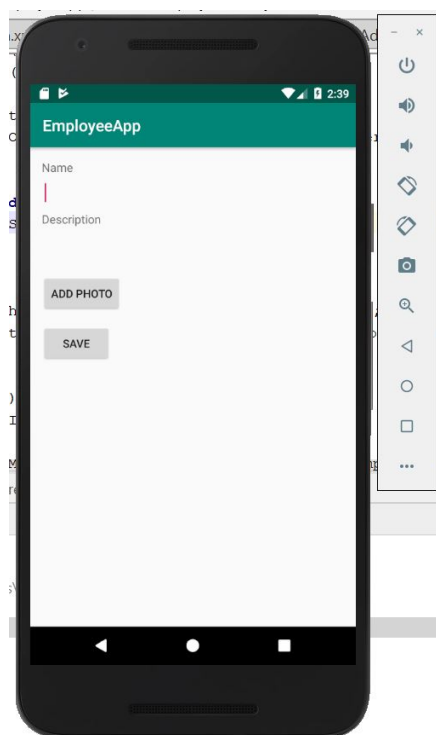
7 8 9 ↩

, 0 . ✓

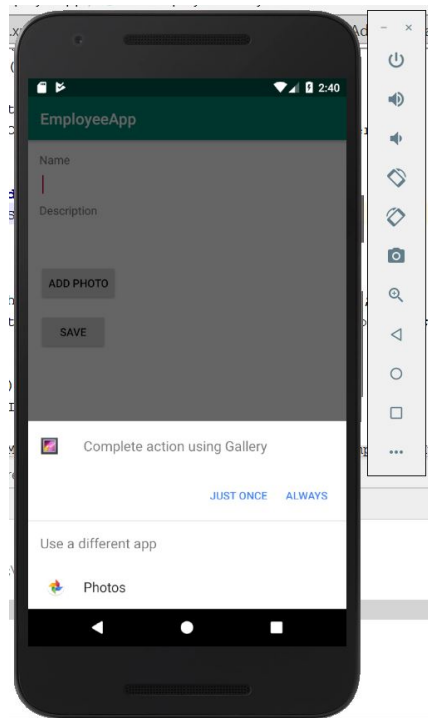
3. Confirm box



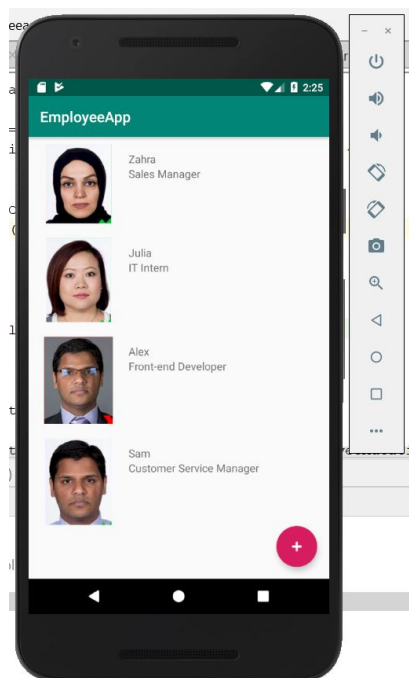
4. Input employee information



5. Show prompt to add profile image



6. Selecting an image from local galley which followed by getting uploaded into s3 automatically right after the user clicks on save button. The picture name and its url in s3 will be saved in DynamoDB as well as user information.



References used

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