San Jose State University
CMPE 202
Summer 2018
T3am Project Report

Professor Paul Nguyen
Professor Gopinath Vinodh

Table of Contents

General Information

Team Members

Our team is called t3am and has the following members:

- Sy Le (006088940)
- Hyunwook Shin (012507417)
- Kevin Lai (008498282)
- Lin Cheng (012484459)

Demo URL / Accounts

Front End App

Front End App can be accessed via

- http://cmpe202-t3am-starbucks-webapp.herokuapp.com

  Demo Account

  email: **syle@gmail.com**
  password: **password**

Back End / API App

Back end app can be accessed via

- http://cmpe202-java-rest-api.herokuapp.com
- http://ec2-34-192-241-153.compute-1.amazonaws.com:8202

Code Repository URLs

Back end (back end api / java server)

https://github.com/nguyensjsu/su18-202-t3am
https://github.com/nguyensjsu/su18-202-t3am/tree/master/web-app

Set up Documentation

Follow this doc to setup the environment locally.
https://docs.google.com/document/d/1YKTlsn7VnxUjwjOXPiQigHKz-usWgbWOH0NESBkKrKk/edit?usp=sharing

Jenkins Server (CI/CD)

https://ec2-18-222-125-85.us-east-2.compute.amazonaws.com/jenkins

Extra Credit Implementations

Our team chooses to implement the following things for extra credit

Implement a "real" iOS or Android Mobile App calling the REST API

Implement Web "Front-End" Deployed to Heroku for Starbucks Payment Card management

Refer to the heroku link above for front end app and the front end code

Deploy API to AWS as Docker Containers in Amazon Containers

DockerFile

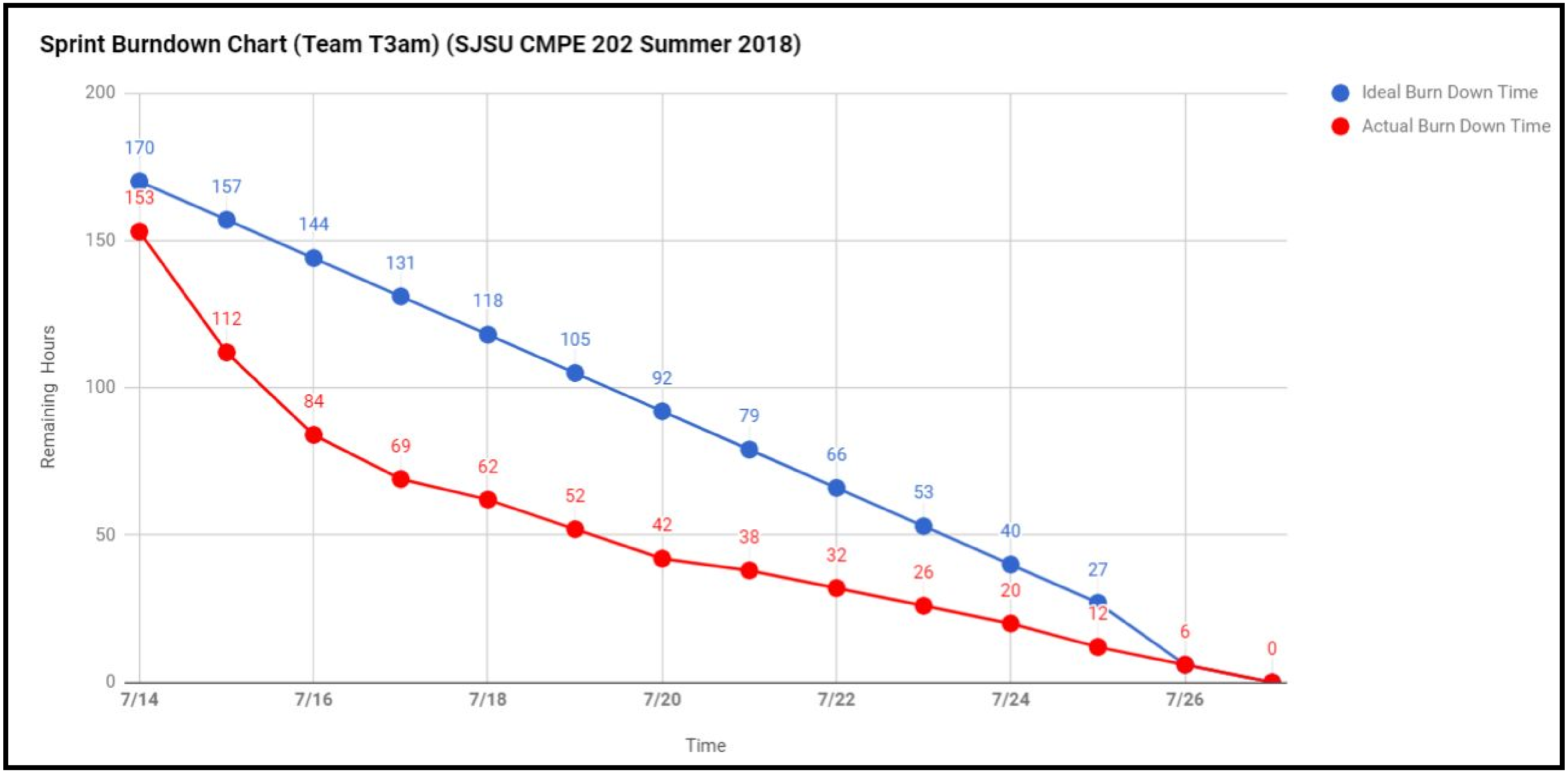
```
FROM java
EXPOSE 8202
COPY . /opt/t3am
CMD nohup java -cp /opt/t3am/starbucks2-service-1.0.jar RestService &
```

More details about the docker file can be found here in our repo
https://github.com/nguyensjsu/su18-202-t3am/blob/master/Dockerfile

Sprint Information

Refer to this link for more information about our doc.
https://docs.google.com/spreadsheets/d/1pfwGInHH9siD7P3Q7gQIALwi6-xfxB6CuSd0tBX_e3c/edit?usp=sharing

Burndown Chart



Team Schedule / Task Allocation

Task	Owner	ETA in Hour
Inital Planning work	Team	2

Set up RDS and DB tables	Lin Cheng	8
Set up the pipeline for webapp (AWS Beanstalk) includes the domain and basic hello world api.	Lin Cheng	2
Set up CI/CD pipeline for the above webapp/noSQL in the github repo...	Hyunwook	2
Initial code plumbing for the API server	Lin Cheng	12
Set up Response Header Content Type - Application/JSON	Sy Le	1
GET /api/v1/signin	Hyunwook	8
GET /api/v1/signout	Hyunwook	4
GET /api/v1/signup	Sy Le	10
GET /api/v1/user_profile return the information related to the user by user_id	Sy Le	4
GET /api/v1/transactions list all the transactions (card reloads vs purchase history) by user_id	Hyunwook & Kevin	8
POST /api/v1/reload add a new card to the list	Lin Cheng	6
POST /api/v1/purchase add a new purchase transaction to the list	Kevin Lai	8
Add Unit Tests	Hyunwook	4
Extra Credit Module 1 - Web Front End client side code development	Sy le	15
Extra Credit Module 1 - Web Front End deployment on Heroku	Sy Le	10
MISC - Deploy BE code to Heroku	Sy Le	16
Docker image and deploy to AWS ECS	Lin Cheng	10
Do Project Report	TEAM	40
		170

Sprint Standup Journal

07/21/2018 to 07/27/2018

- Team mainly works on project report

07/20/2018

- Done Front End and Deployed Front End App and API to Heroku
    - api : http://cmpe202-java-rest-api.herokuapp.com
    - webapp : http://cmpe202-t3am-starbucks-webapp.herokuapp.com
- Started and work on report

07/19/2018

- Complete last set of flow front end integration
- Start work on the deployment of front end heroku deployment
- Added Validation to API
- Wrap server response in ServerResponse
- Start work on project report
- Successfully run on AWS ECS Fargate

07/17/2018 to 07/18/2018

- Continue working on integrating Web FE in Add Purchase Flow
- Refactored and clean up code to make the Add Purchase API flow to work
- Clean up sql_backup file
- Docker container for the API later
- WIP - Continued Add mode unit tests

07/16/2018

- Completed API to sign in using `email` and `password`
- Deployed our API Back End to heroku: http://cmpe202-java-rest-api.herokuapp.com
- Continued BE and FE (webapp)integration work: authentication (signin / signup) flow
- Parameterized Database Connection Strings, App Host, App Port into environment for deployment.
- Fixed UserProfile Fetch API to return real data instead of mocks

- WIP - CI/CD pipeline with jenkins
- WIP - Plumbing up unit tests

07/15/2018

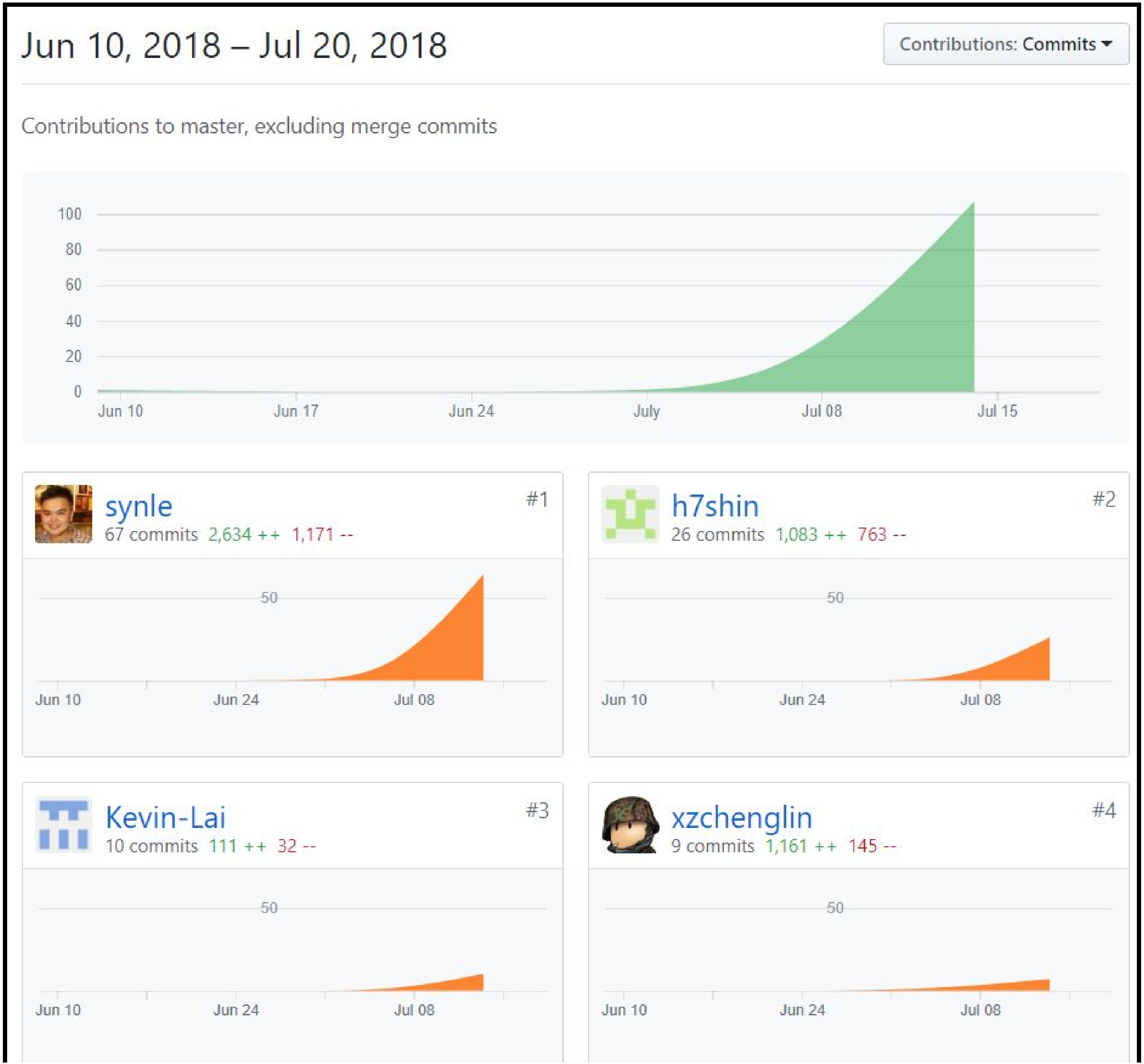
- Initial Code complete, Server is now Up and Running
- Created 2 AWS EC instances for prod and dev
  - PROD: ec2-18-209-62-254.compute-1.amazonaws.com
  - DEV: ec2-34-192-241-153.compute-1.amazonaws.com
- Created AWS RDS for data store
- Functional getCards API
- Functional signUp API
- Basic plumbing works for POJO Objects such as `Purchase`, `UserProfile`, `Card`
- Created SQL Backup file for new deployment `sql_backup`

07/14/2018

- Team meetup, draft out dependencies, task breakdown and initial work

Github Push Contributors Graph

https://github.com/nguyensjsu/su18-202-t3am/graphs/contributors



Jun 10, 2018 – Jul 20, 2018

Contributions: **Commits** ▾

Contributions to master, excluding merge commits

synle #1

67 commits 2,634 ++ 1,171 --

h7shin #2

26 commits 1,083 ++ 763 --

Kevin-Lai #3

10 commits 111 ++ 32 --

xzchenglin #4

9 commits 1,161 ++ 145 --

Technologies

Back End

Apache Camel

The back end is built using Apache Camel which is used to serve up REST API endpoints.

Maven

The back end project is bundled using maven.

Google Guice

We used Guice to handle dependencies injection, namely @Inject

iBATIS Data Mapping Framework

Internally we used iBATIS to map java code to SQL queries

Front End (webapp)

The front end application in this project is a thin layer that handles integration with the back end API described above to handle basic flows of payments, purchases, reloads for drink ordering.

jQuery, jQuery UI, bootstrap and moment.js

The front end is built using Bootstrap, jQuery, jQuery UI to construct the major piece of the UI and moment.js to handle date formatting

Deployment

As for deployment, we used Heroku to deploy. You can find more information below.

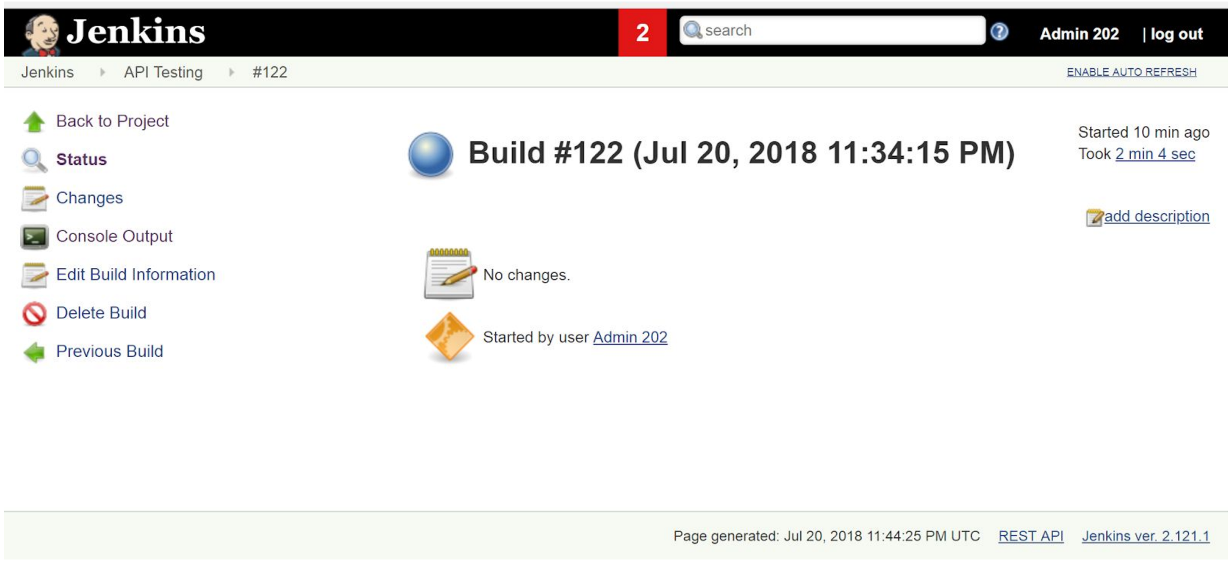
Testing and CI/CD

JUnit/Python Unit Test

Junit library is used to run component-level unit tests in tools and models packages.
Python unittest library stress the end-to-end API testing on a local mock server.

Jenkins

Jenkins job starts a test backend server locally by compiling the source code from GitHub using “make run”. As the Jenkins node does not have access to the git repository, we instead have created a recent copy of the source code (instead of git clone). After starting a service that listens to port 8082, Jenkins runs “make test” to run a series of API testing against the local server. This is ensure that there is no regressions or unexpected failures in our APIs. Once both JUnit and Python (end-to-end API) tests pass, the job will be marked as SUCCESS.



Build #122 (Jul 20, 2018 11:34:15 PM)

Started 10 min ago
Took 2 min 4 sec

No changes.

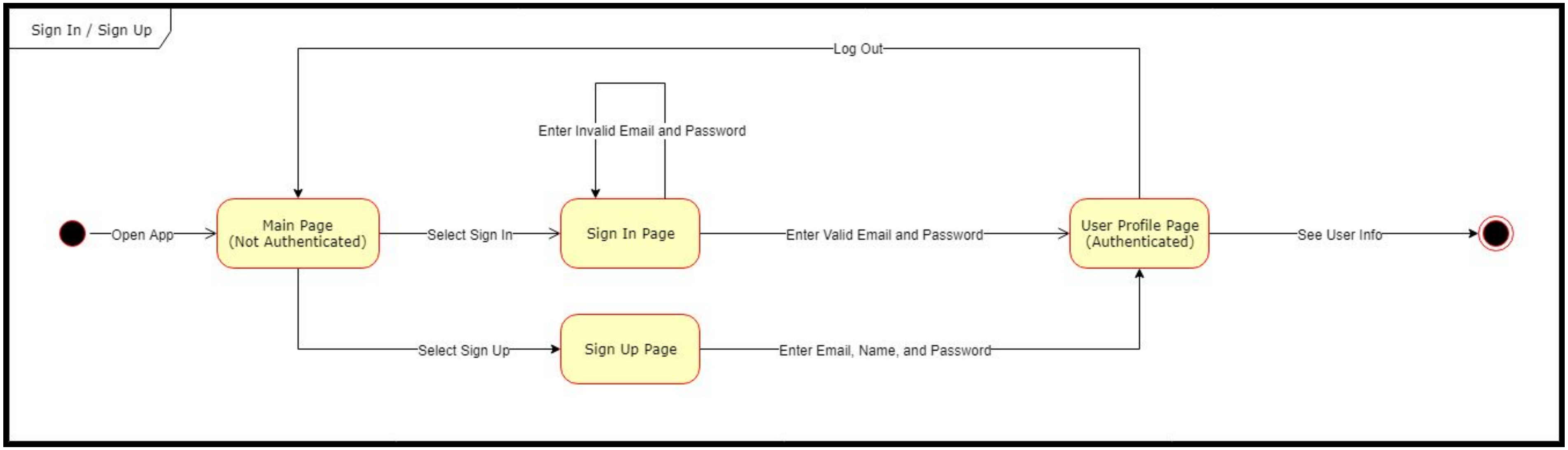
Started by user Admin 202

Page generated: Jul 20, 2018 11:44:25 PM UTC

Ngnix

Nginx is used to route requests to Jenkins HTTPS server https://ec2-18-222-125-85.us-east-2.compute.amazonaws.com:8081/login

App Flow

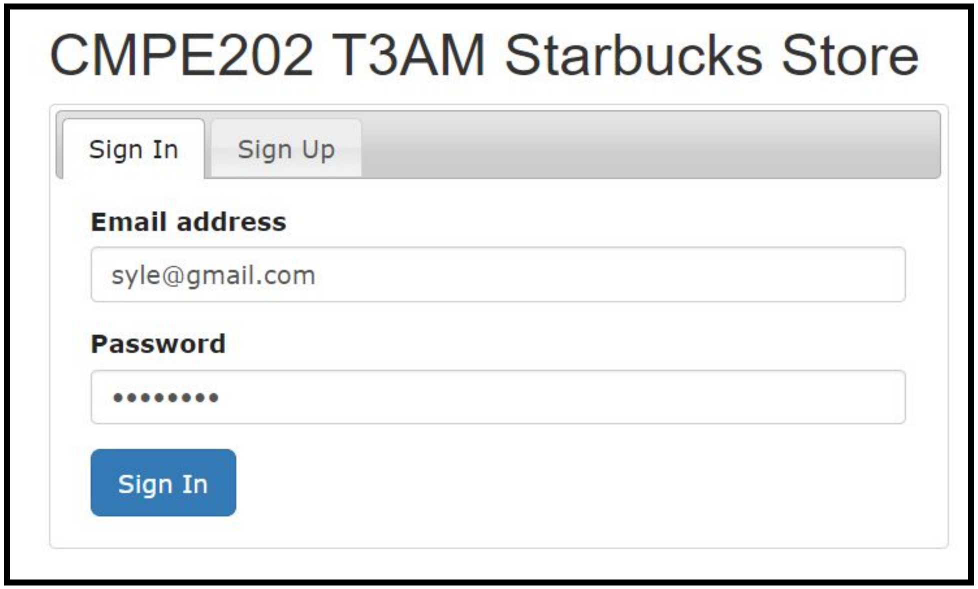

Sign In / Sign Up
Log Out
Enter Invalid Email and Password
Open App
Main Page (Not Authenticated)
Select Sign In
Sign In Page
Enter Valid Email and Password
User Profile Page (Authenticated)
See User Info
Select Sign Up
Sign Up Page
Enter Email, Name, and Password

Sign up flow

New users used this to sign up for new account

Login flow

Existing users log in with their existing account



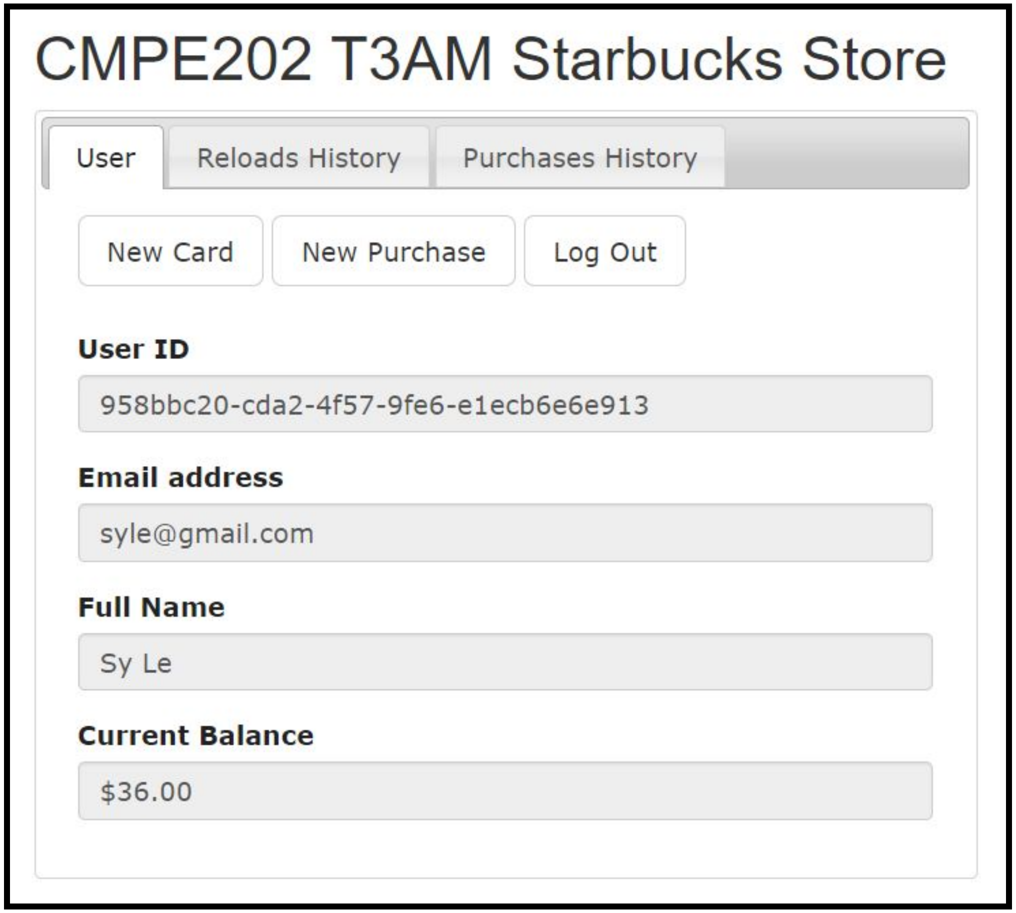
CMPE202 T3AM Starbucks Store

Email address: syle@gmail.com

Password: ••••••••

Dashboard

This is where users check their remaining balance as well as some information about their account



CMPE202 T3AM Starbucks Store

User ID

958bbc20-cda2-4f57-9fe6-e1ecb6e6e913

Email address

syle@gmail.com

Full Name

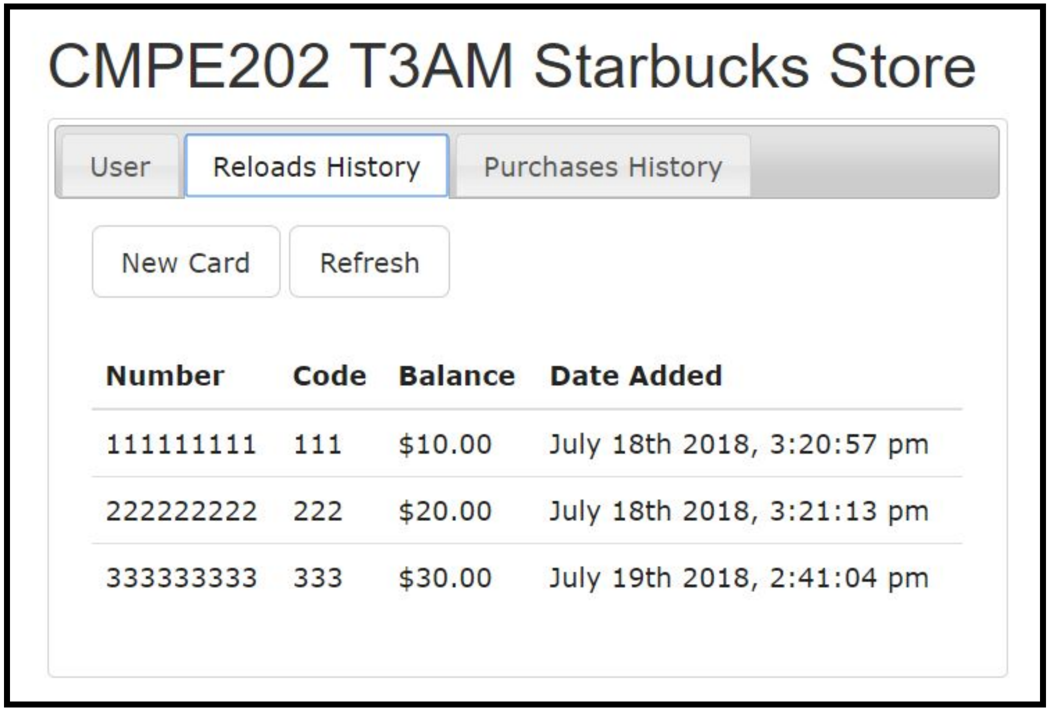
Sy Le

Current Balance

$36.00

Cards List

This is where user look for their previous reloaded gift cards

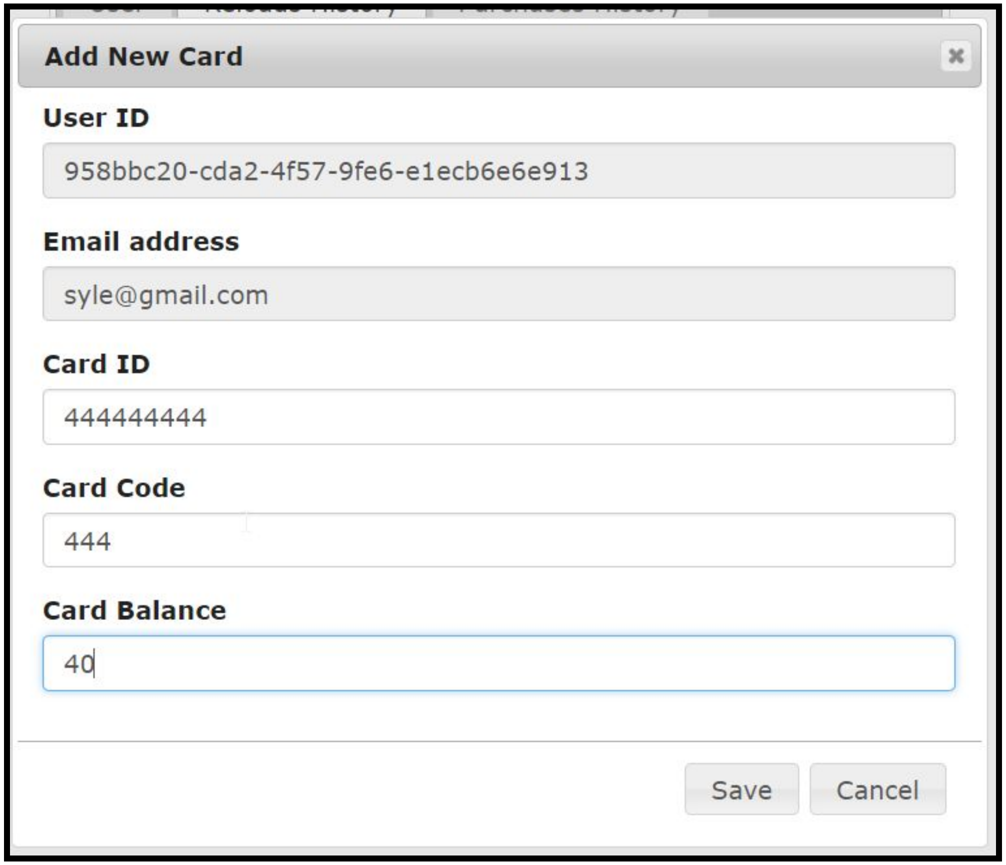


CMPE202 T3AM Starbucks Store

Number	Code	Balance	Date Added
111111111	111	$10.00	July 18th 2018, 3:20:57 pm
222222222	222	$20.00	July 18th 2018, 3:21:13 pm
333333333	333	$30.00	July 19th 2018, 2:41:04 pm

Add New Card

This is where user add a new gift card



Add New Card

User ID: 958bbc20-cda2-4f57-9fe6-e1ecb6e6e913

Email address: syle@gmail.com

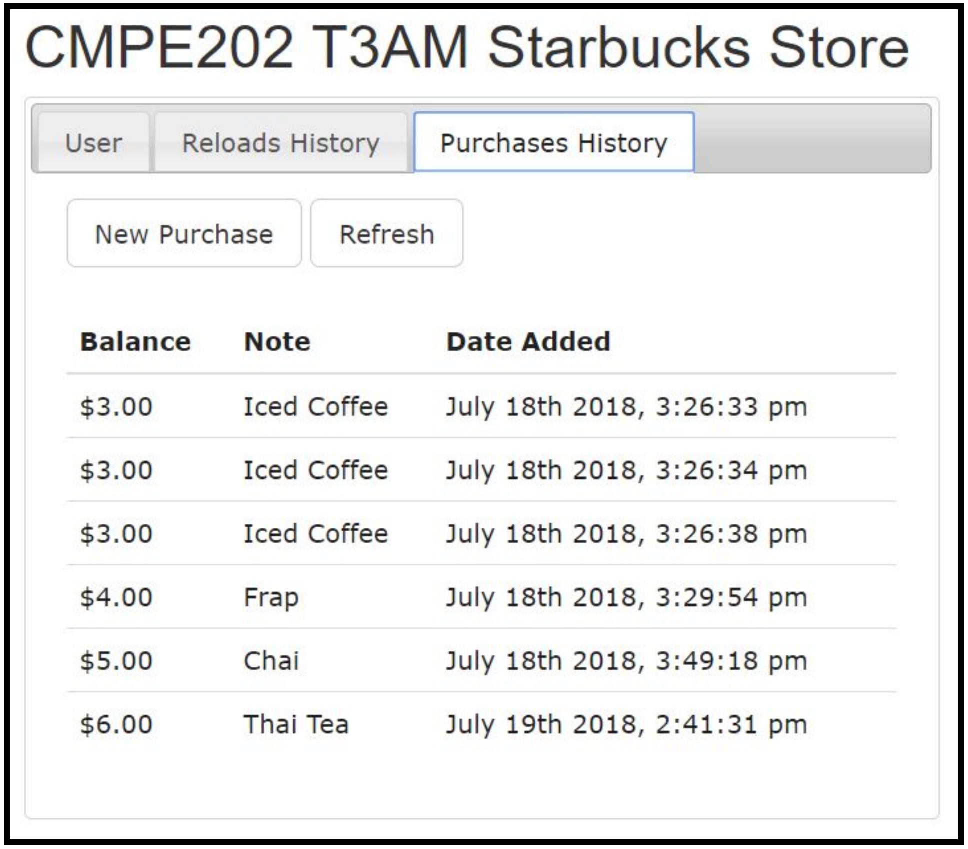
Card ID: 444444444

Card Code: 444

Card Balance: 40

Purchases List

This is where users can view their previous purchases

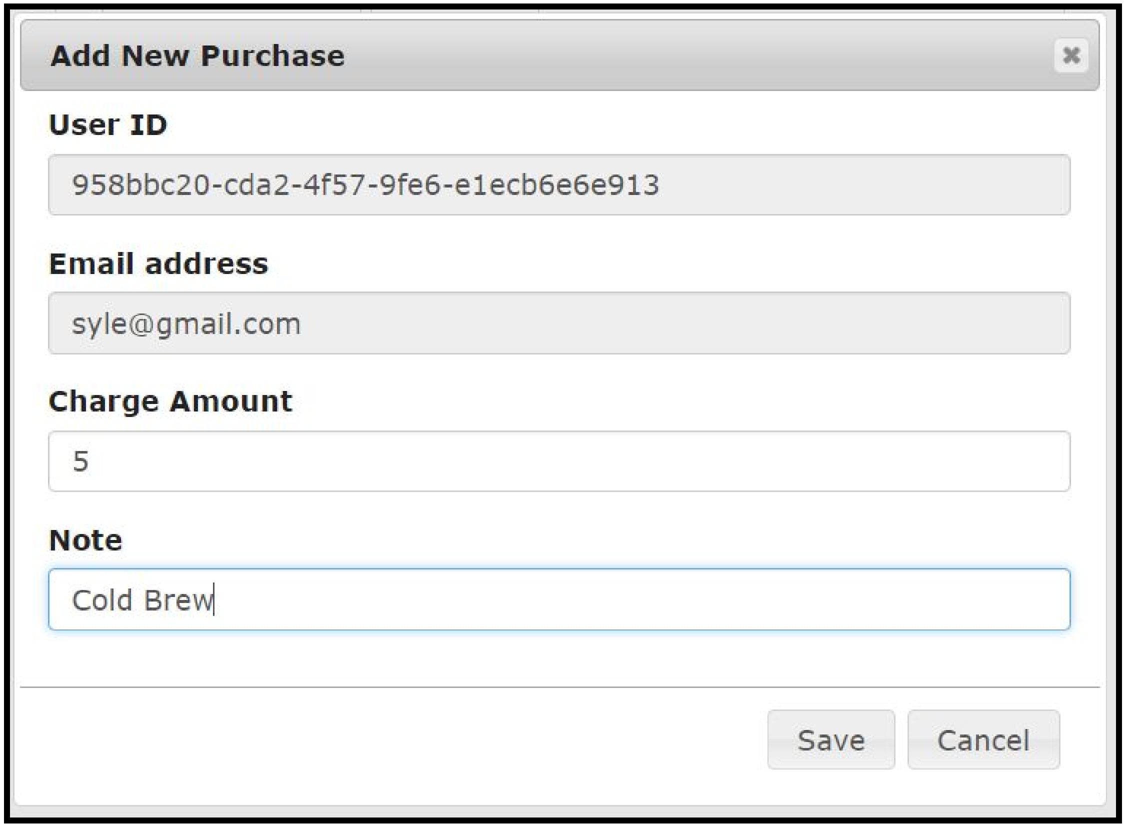


CMPE202 T3AM Starbucks Store

Balance	Note	Date Added
$3.00	Iced Coffee	July 18th 2018, 3:26:33 pm
$3.00	Iced Coffee	July 18th 2018, 3:26:34 pm
$3.00	Iced Coffee	July 18th 2018, 3:26:38 pm
$4.00	Frap	July 18th 2018, 3:29:54 pm
$5.00	Chai	July 18th 2018, 3:49:18 pm
$6.00	Thai Tea	July 19th 2018, 2:41:31 pm

Add New Purchase

This is where the user add a new purchase



Add New Purchase

User ID

958bbc20-cda2-4f57-9fe6-e1ecb6e6e913

Email address

syle@gmail.com

Charge Amount

5

Note

Cold Brew

Cloud Infrastructure

Back End Deployment

Docker on AWS ECS

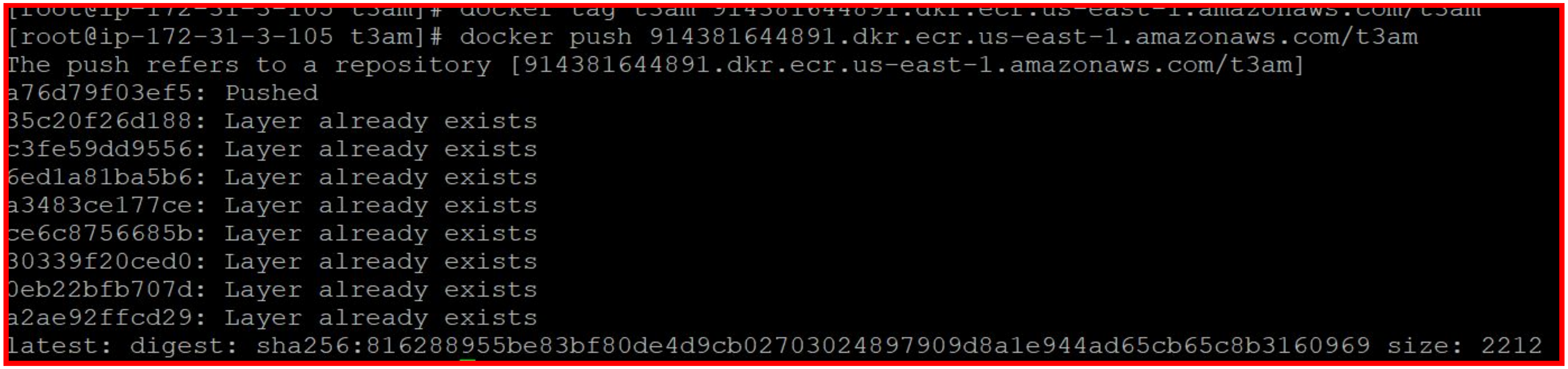
Build Docker image

- Check out code
- Go to source root(su18-202-t3am) and do a “mvn install”

- Run “java -cp starbucks2-service/target/starbucks2-service-1.0.jar RestService”
- Copy starbucks2-service/target/starbucks2-service-1.0.jar and starbucks2-service/target/lib/ to EC2 server’s /opt/t3am
- From /opt/t3am, “docker build -t t3am .”

Push to ECS repository

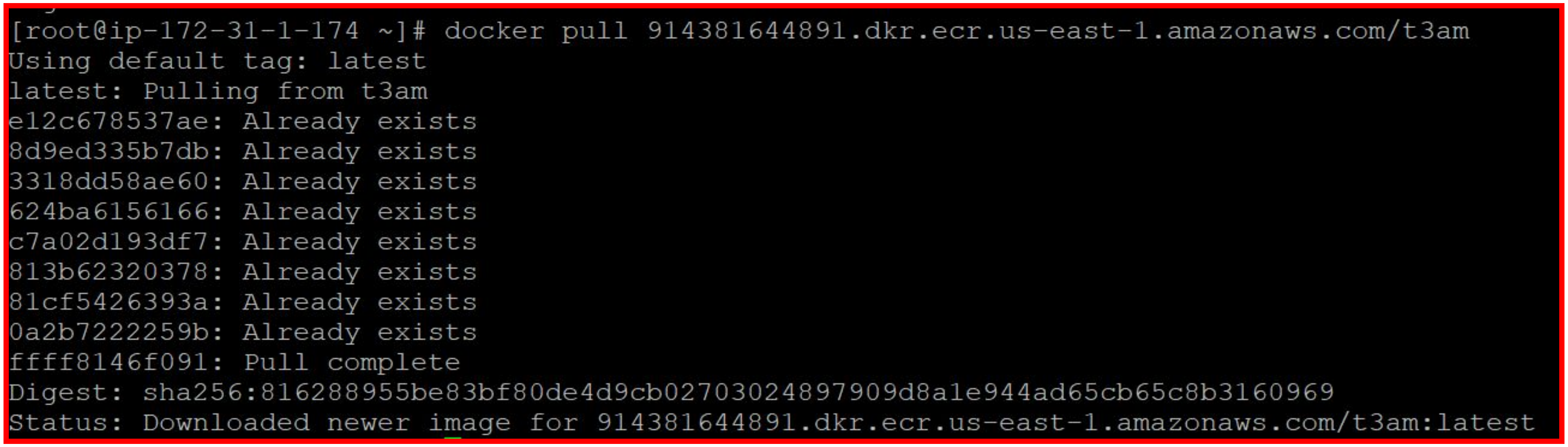
- Login to AWS ECR: “aws ecr get-login --no-include-email”
- Create repository: “aws ecr create-repository --repository-name t3am”
- Tag image: “docker tag t3am 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am”
- Push: “docker push 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am”



```
[root@ip-172-31-3-105 t3am]# docker tag t3am 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am
[root@ip-172-31-3-105 t3am]# docker push 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am
The push refers to a repository [914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am]
a76d79f03ef5: Pushed
35c20f26d188: Layer already exists
c3fe59dd9556: Layer already exists
6ed1a81ba5b6: Layer already exists
a3483ce177ce: Layer already exists
ce6c8756685b: Layer already exists
30339f20ced0: Layer already exists
0eb22bfb707d: Layer already exists
a2ae92ffcd29: Layer already exists
latest: digest: sha256:816288955be83bf80de4d9cb02703024897909d8a1e944ad65cb65c8b3160969 size: 2212
```

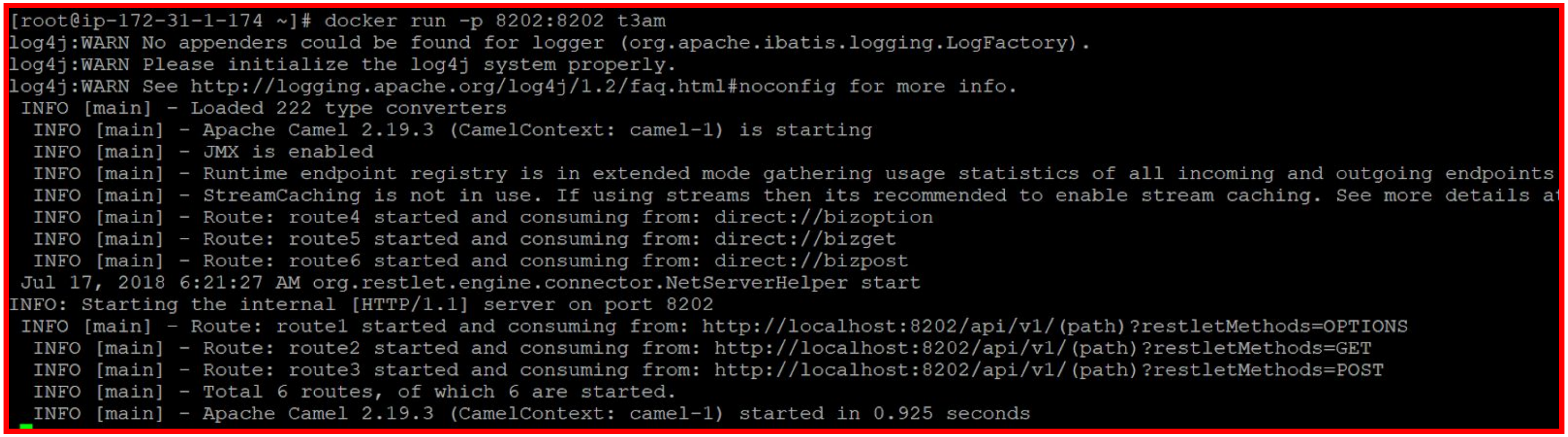
Run from EC2

- Login to AWS ECR: “aws ecr get-login --no-include-email”
- Pull: “docker pull 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am”



```
[root@ip-172-31-1-174 ~]# docker pull 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am
Using default tag: latest
latest: Pulling from t3am
e12c678537ae: Already exists
8d9ed335b7db: Already exists
3318dd58ae60: Already exists
624ba6156166: Already exists
c7a02d193df7: Already exists
813b62320378: Already exists
81cf5426393a: Already exists
0a2b7222259b: Already exists
ffff8146f091: Pull complete
Digest: sha256:816288955be83bf80de4d9cb02703024897909d8a1e944ad65cb65c8b3160969
Status: Downloaded newer image for 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am:latest
```

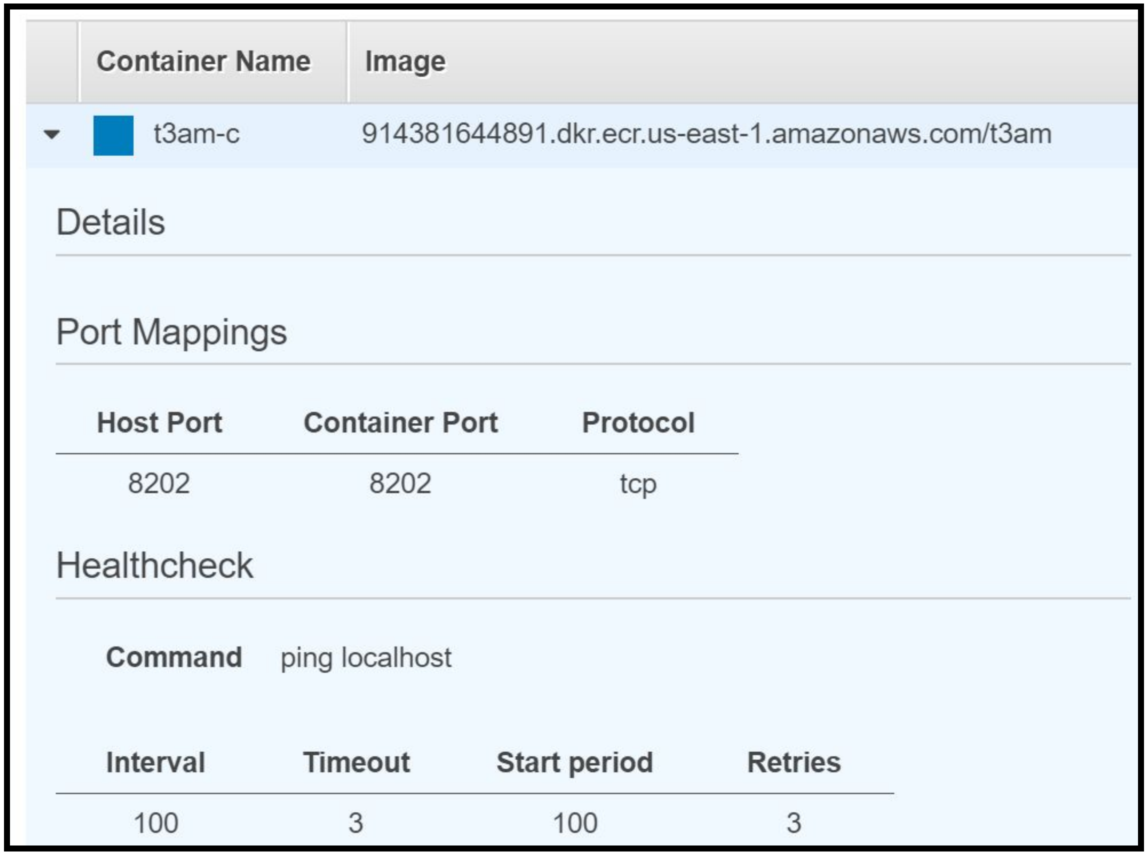
- Tag image: “docker tag 914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am t3am”
- Run: “docker run -p 8202:8202 t3am”



```
[root@ip-172-31-1-174 ~]# docker run -p 8202:8202 t3am
log4j:WARN No appenders could be found for logger (org.apache.ibatis.logging.LogFactory).
log4j:WARN Please initialize the log4j system properly.
log4j:WARN See http://logging.apache.org/log4j/1.2/faq.html#noconfig for more info.
 INFO [main] - Loaded 222 type converters
  INFO [main] - Apache Camel 2.19.3 (CamelContext: camel-1) is starting
  INFO [main] - JMX is enabled
  INFO [main] - Runtime endpoint registry is in extended mode gathering usage statistics of all incoming and outgoing endpoints
  INFO [main] - StreamCaching is not in use. If using streams then its recommended to enable stream caching. See more details at
  INFO [main] - Route: route4 started and consuming from: direct://bizoption
  INFO [main] - Route: route5 started and consuming from: direct://bizget
  INFO [main] - Route: route6 started and consuming from: direct://bizpost
 Jul 17, 2018 6:21:27 AM org.restlet.engine.connector.NetServerHelper start
INFO: Starting the internal [HTTP/1.1] server on port 8202
 INFO [main] - Route: route1 started and consuming from: http://localhost:8202/api/v1/(path)?restletMethods=OPTIONS
  INFO [main] - Route: route2 started and consuming from: http://localhost:8202/api/v1/(path)?restletMethods=GET
  INFO [main] - Route: route3 started and consuming from: http://localhost:8202/api/v1/(path)?restletMethods=POST
  INFO [main] - Total 6 routes, of which 6 are started.
  INFO [main] - Apache Camel 2.19.3 (CamelContext: camel-1) started in 0.925 seconds
```

Run from ECS Fargate

- Define a Fargate Task using the docker image



Container Name	Image
t3am-c	914381644891.dkr.ecr.us-east-1.amazonaws.com/t3am

Details

Port Mappings

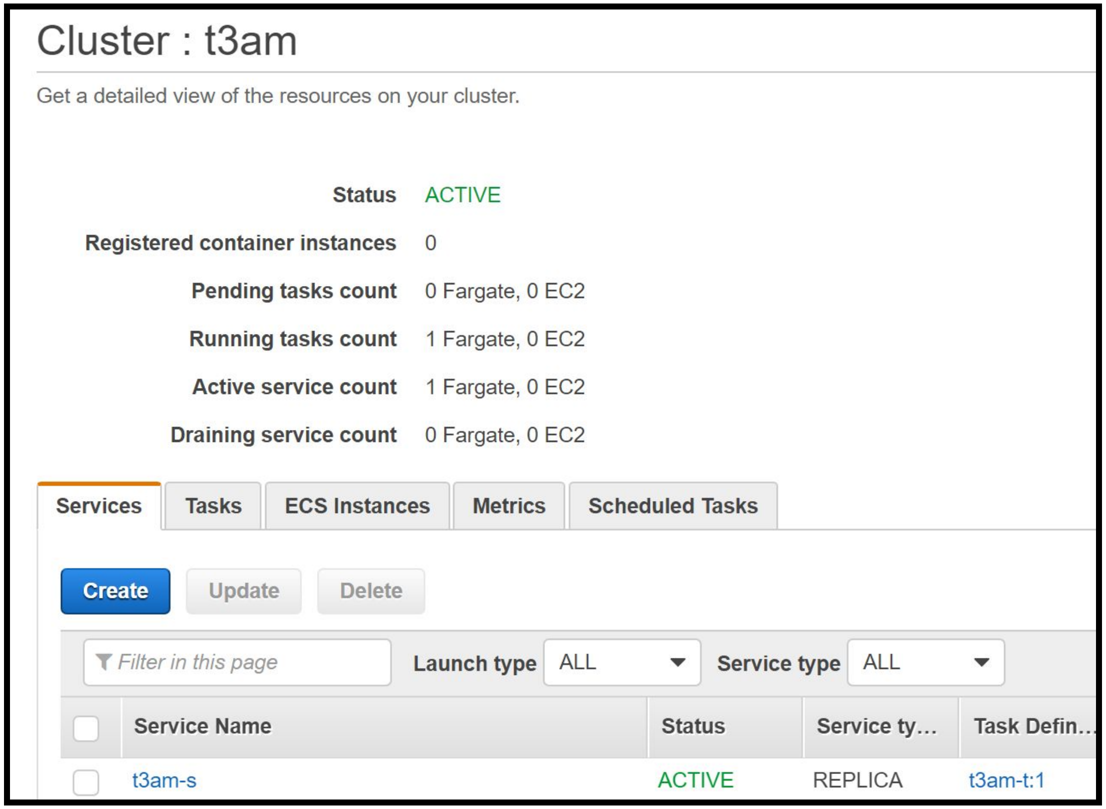
Host Port	Container Port	Protocol
8202	8202	tcp

Healthcheck

Command ping localhost

Interval	Timeout	Start period	Retries
100	3	100	3

- Create a cluster and run the task



Cluster : t3am

Get a detailed view of the resources on your cluster.

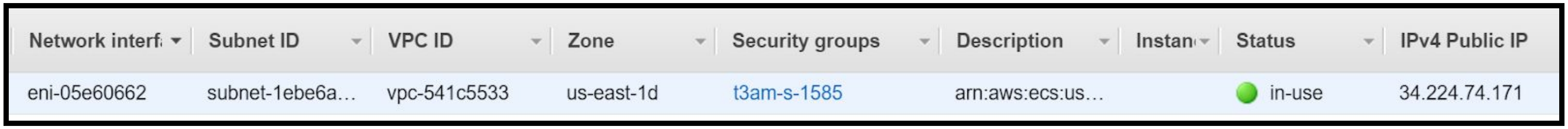
Status	ACTIVE
Registered container instances	0
Pending tasks count	0 Fargate, 0 EC2
Running tasks count	1 Fargate, 0 EC2
Active service count	1 Fargate, 0 EC2
Draining service count	0 Fargate, 0 EC2

Launch type ALL

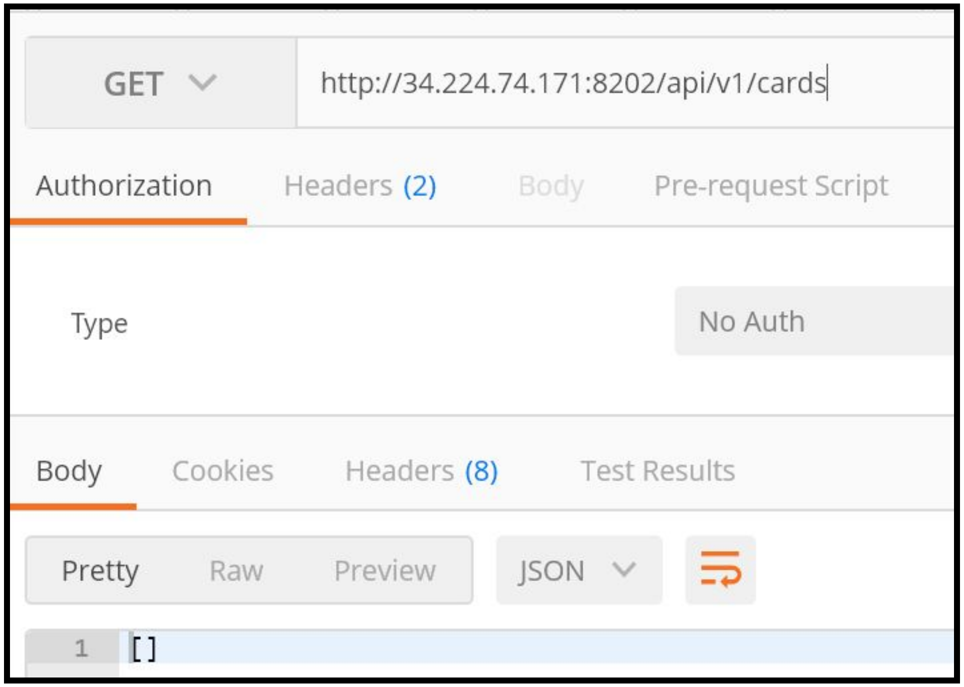
Service type ALL

□	Service Name	Status	Service ty...	Task Defin...
□	t3am-s	ACTIVE	REPLICA	t3am-t:1

- Get the created instance IP and try visiting



Network interf	Subnet ID	VPC ID	Zone	Security groups	Description	Instan	Status	IPv4 Public IP
eni-05e60662	subnet-1ebe6a...	vpc-541c5533	us-east-1d	t3am-s-1585	arn:aws:ecs:us...		● in-use	34.224.74.171



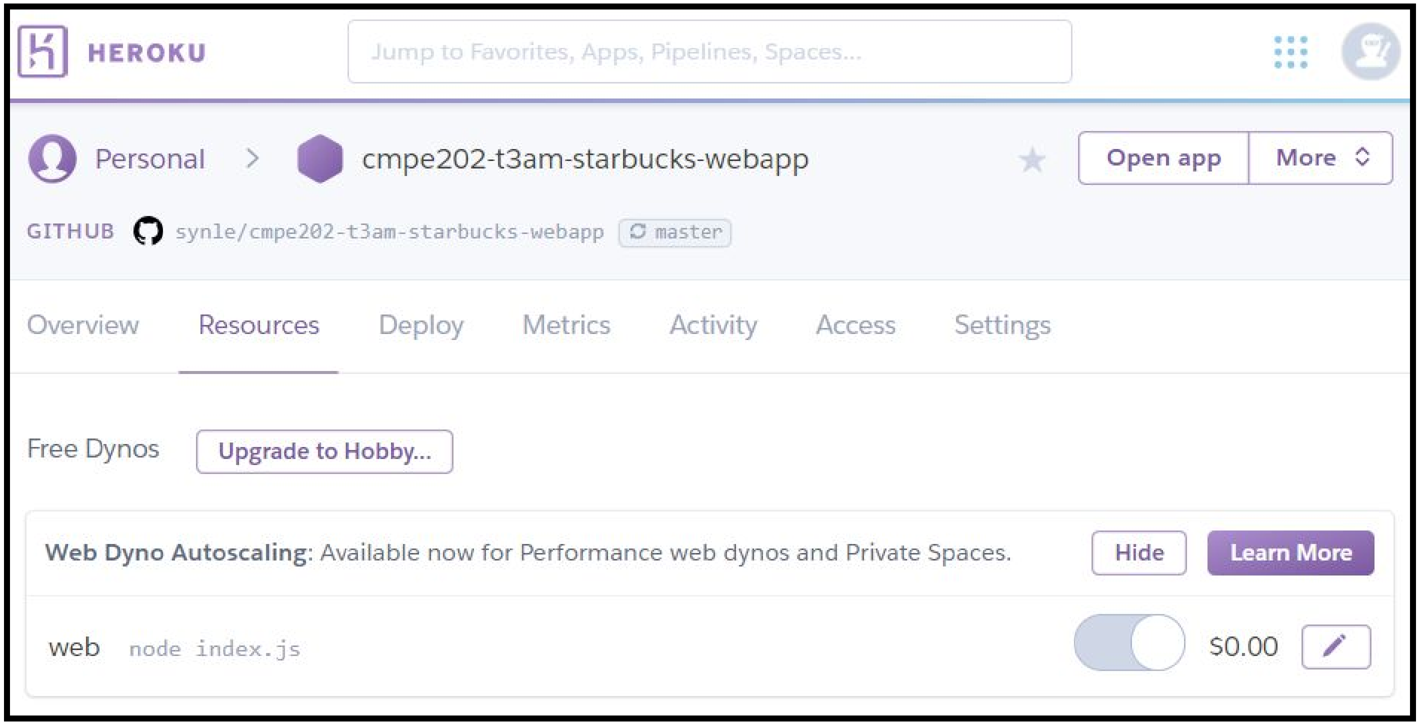
GET http://34.224.74.171:8202/api/v1/cards

Type No Auth

```
[]
```

Front End Heroku deployment

App Setup



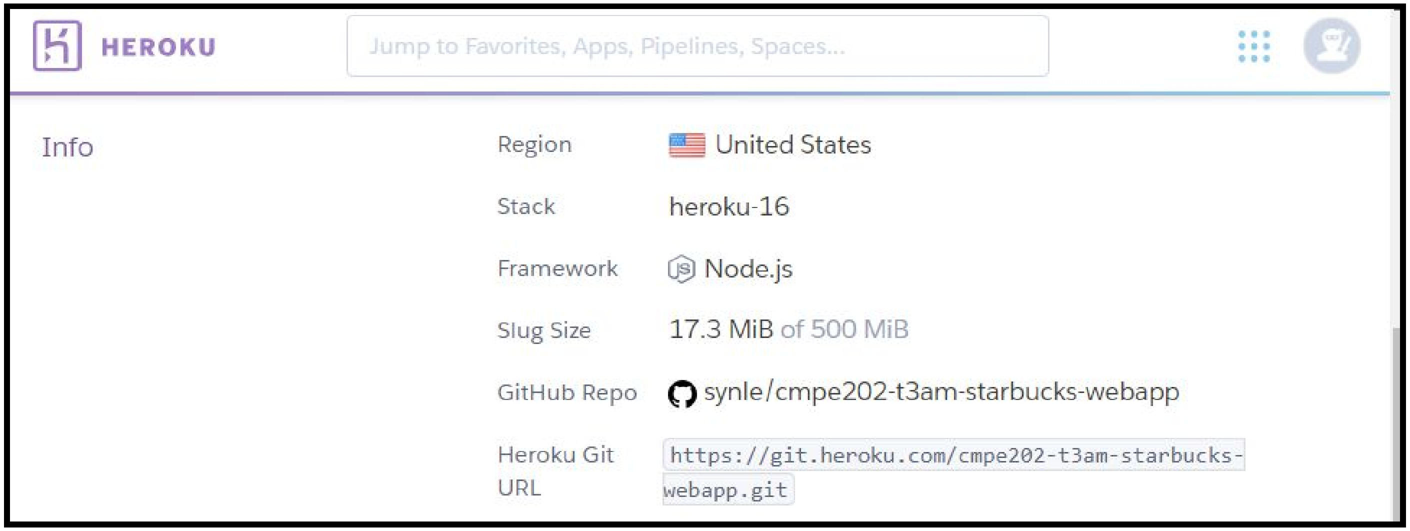
Personal > cmpe202-t3am-starbucks-webapp

GITHUB synle/cmpe202-t3am-starbucks-webapp master

Free Dynos

Web Dyno Autoscaling: Available now for Performance web dynos and Private Spaces.

web `node index.js` $0.00

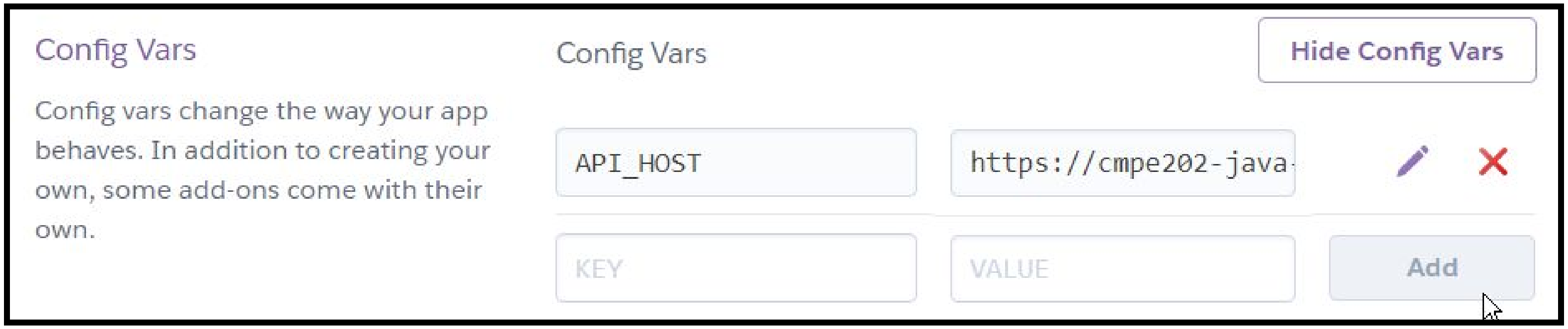


Info

Region	United States
Stack	heroku-16
Framework	Node.js
Slug Size	17.3 MiB of 500 MiB
GitHub Repo	synle/cmpe202-t3am-starbucks-webapp
Heroku Git URL	`https://git.heroku.com/cmpe202-t3am-starbucks-webapp.git`

Config Vars

API_HOST is set in the config file which the front end app is used to communicate with the back end API



Config Vars

Config vars change the way your app behaves. In addition to creating your own, some add-ons come with their own.

Config Vars

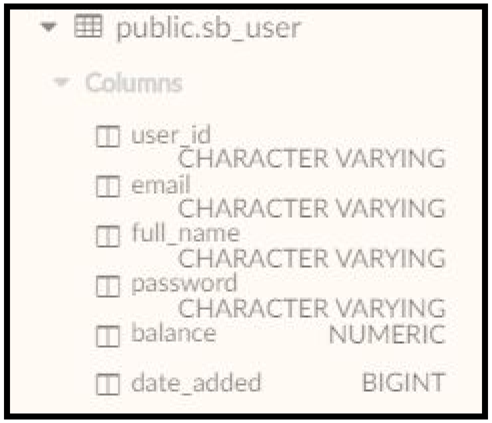
API_HOST	https://cmpe202-java-

Database Schema

sb_user

This is where we stores users' information

Schema

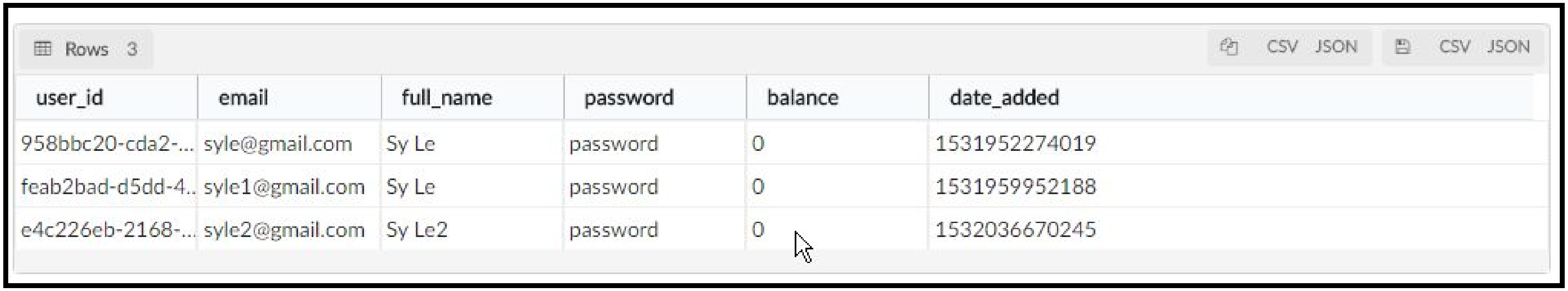


public.sb_user

Columns

user_id	CHARACTER VARYING
email	CHARACTER VARYING
full_name	CHARACTER VARYING
password	CHARACTER VARYING
balance	NUMERIC
date_added	BIGINT

Results

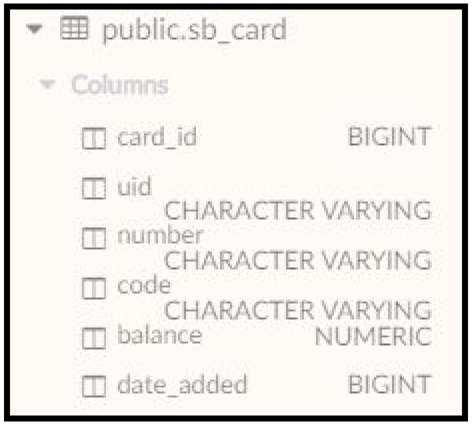


user_id	email	full_name	password	balance	date_added
958bbc20-cda2-...	syle@gmail.com	Sy Le	password	0	1531952274019
feab2bad-d5dd-4..	syle1@gmail.com	Sy Le	password	0	1531959952188
e4c226eb-2168-...	syle2@gmail.com	Sy Le2	password	0	1532036670245

sb_card

This is where we stores previous reloaded card. This has a user_id foreign key that relates records to users

Schema

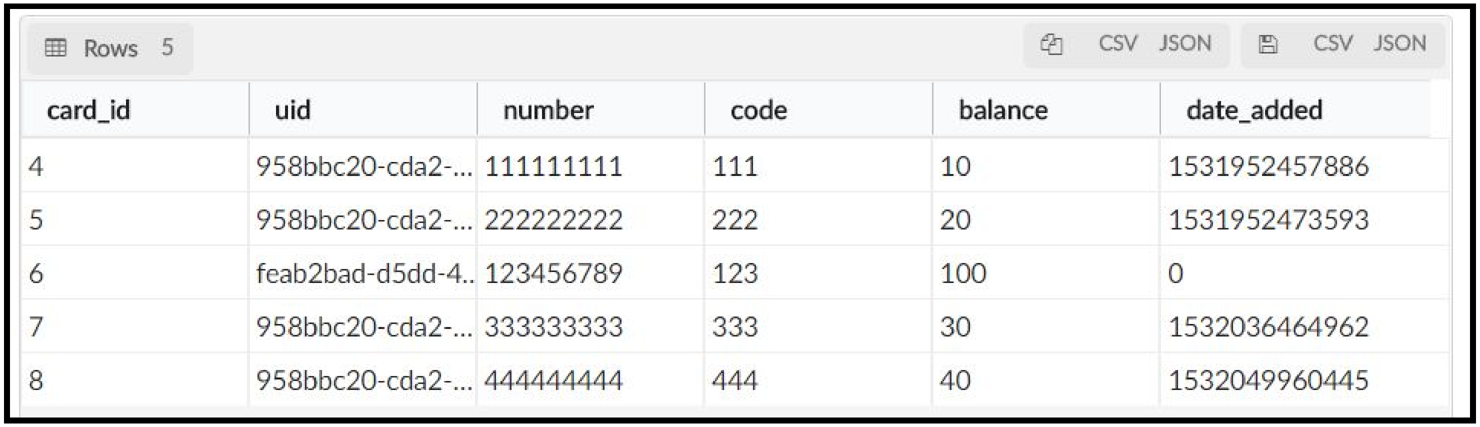


public.sb_card

Columns

card_id	BIGINT
uid	CHARACTER VARYING
number	CHARACTER VARYING
code	CHARACTER VARYING
balance	NUMERIC
date_added	BIGINT

Results

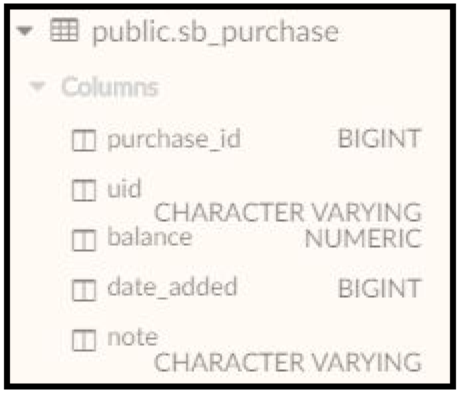


card_id	uid	number	code	balance	date_added
4	958bbc20-cda2-...	111111111	111	10	1531952457886
5	958bbc20-cda2-...	222222222	222	20	1531952473593
6	feab2bad-d5dd-4..	123456789	123	100	0
7	958bbc20-cda2-...	333333333	333	30	1532036464962
8	958bbc20-cda2-...	444444444	444	40	1532049960445

sb_purchase

This is where we stores previous purchases. This has a user_id foreign key that relates records to users

Schema

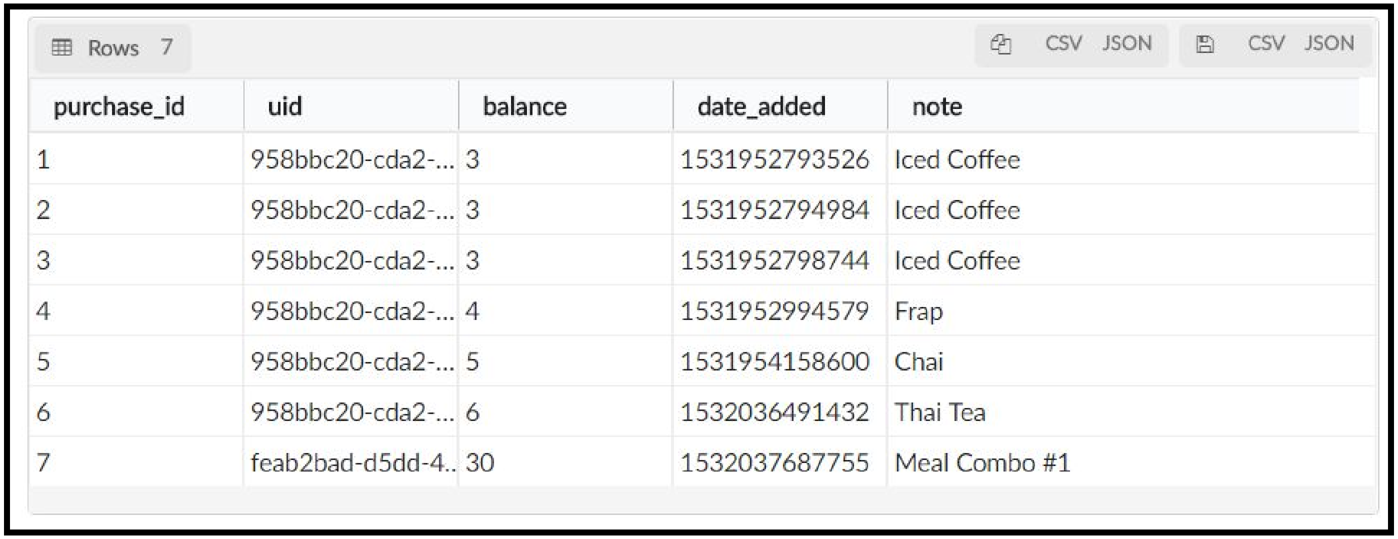


public.sb_purchase

Columns

purchase_id	BIGINT
uid	CHARACTER VARYING
balance	NUMERIC
date_added	BIGINT
note	CHARACTER VARYING

Results



purchase_id	uid	balance	date_added	note
1	958bbc20-cda2-...	3	1531952793526	Iced Coffee
2	958bbc20-cda2-...	3	1531952794984	Iced Coffee
3	958bbc20-cda2-...	3	1531952798744	Iced Coffee
4	958bbc20-cda2-...	4	1531952994579	Frap
5	958bbc20-cda2-...	5	1531954158600	Chai
6	958bbc20-cda2-...	6	1532036491432	Thai Tea
7	feab2bad-d5dd-4..	30	1532037687755	Meal Combo #1

API Spec

Sign up (Create User)

This API is used for NEW users to sign up for new account.

Curl Sample

```
curl -X POST \
  http://localhost:8202/api/v1/signup \
  -H 'accept: application/json' \
  -d '{
  "email": "syle1@gmail.com",
  "full_name": "Sy Le",
  "password": "password"
}'
```

Response

https://github.com/nguyensjsu/su18-202-t3am/blob/master/starbucks2-domain/src/main/java/model/UserProfile.java

Sign in (Log in)

This API is used for EXISTING users to sign in with their old account.

Curl Sample

```
curl -X POST \
  http://localhost:8202/api/v1/signin \
  -H 'accept: application/json' \
  -d '{
```

```
  "email": "syle1@gmail.com",
  "password": "password"
}'
```

Response

https://github.com/nguyensjsu/su18-202-t3am/blob/master/starbucks2-domain/src/main/java/model/UserProfile.java

Get Cards Reload by UserId

This API is used to get a list of cards reloaded by userId

Curl Sample

```
curl -X GET \
  'http://localhost:8202/api/v1/cards?uid=2c60158e-d432-4b78-a300-360cc6fa7260'
```

Response

https://github.com/nguyensjsu/su18-202-t3am/blob/master/starbucks2-domain/src/main/java/model/Card.java

Reload Card by UserId

This API is used to add/reload a card for a user by UserId

Curl Sample

```
curl 'http://localhost:8080/api/v1/reload' \8081/no-referrer' \
    -H 'Connection: keep-alive' \
    -H 'DNT: 1' --data-binary
'{"uid":"958bbc20-cda2-4f57-9fe6-e1ecb6e6e913","number":"111111111","code":"111","balance":"10"}'
```

Response

https://github.com/nguyensjsu/su18-202-t3am/blob/master/starbucks2-domain/src/main/java/model/Card.java

Get Purchases by UserId

This API is used to get a list of previous purchases by UserID

Curl Sample

```
curl -X GET \
  'http://localhost:8202/api/v1/purchases?uid=2c60158e-d432-4b78-a300-360cc6fa7260'
```

Response

https://github.com/nguyensjsu/su18-202-t3am/blob/master/starbucks2-domain/src/main/java/model/Purchase.java

Add Purchase by UserId

This API is used to add a purchase by UserID

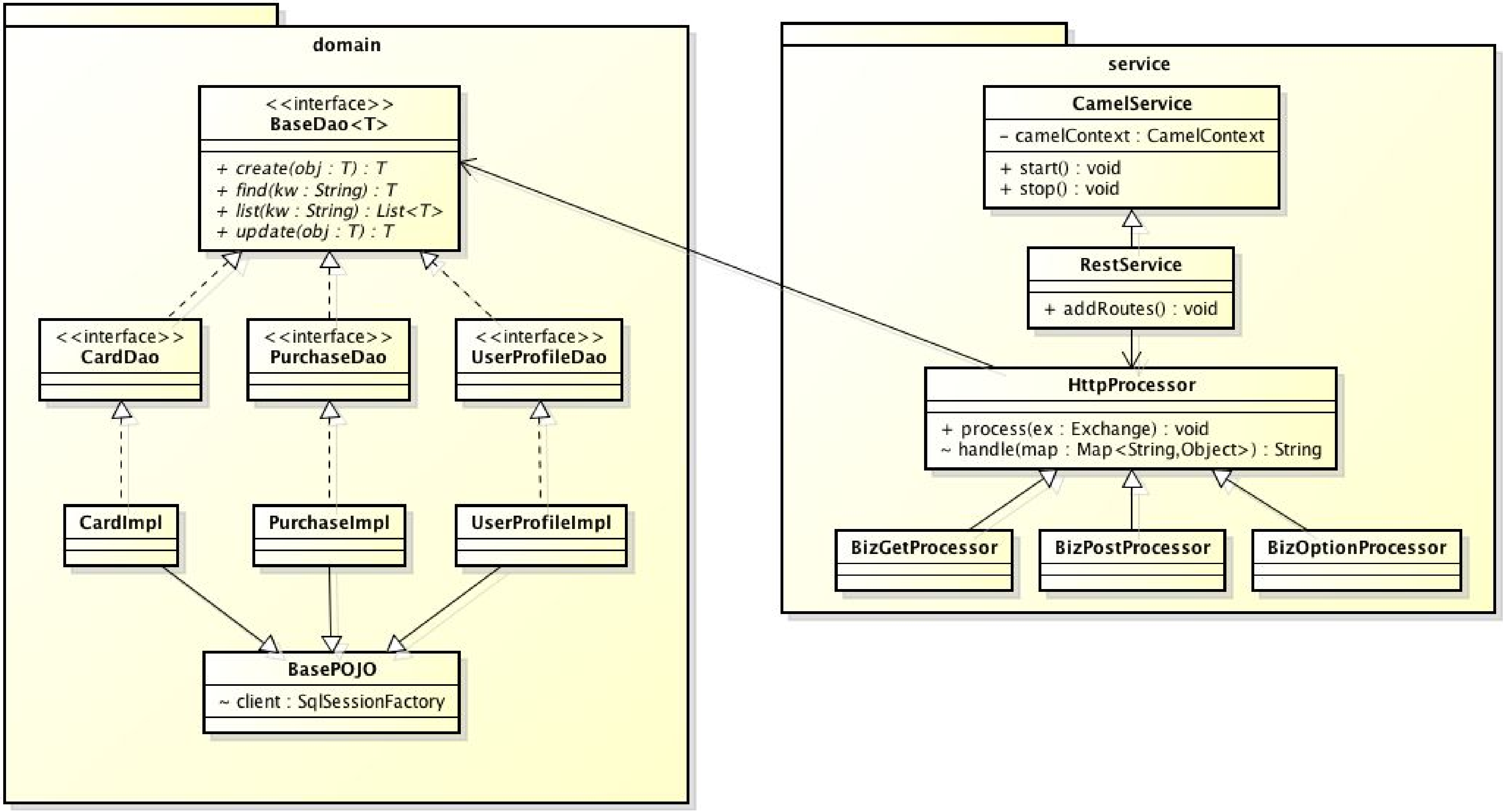
Curl Sample

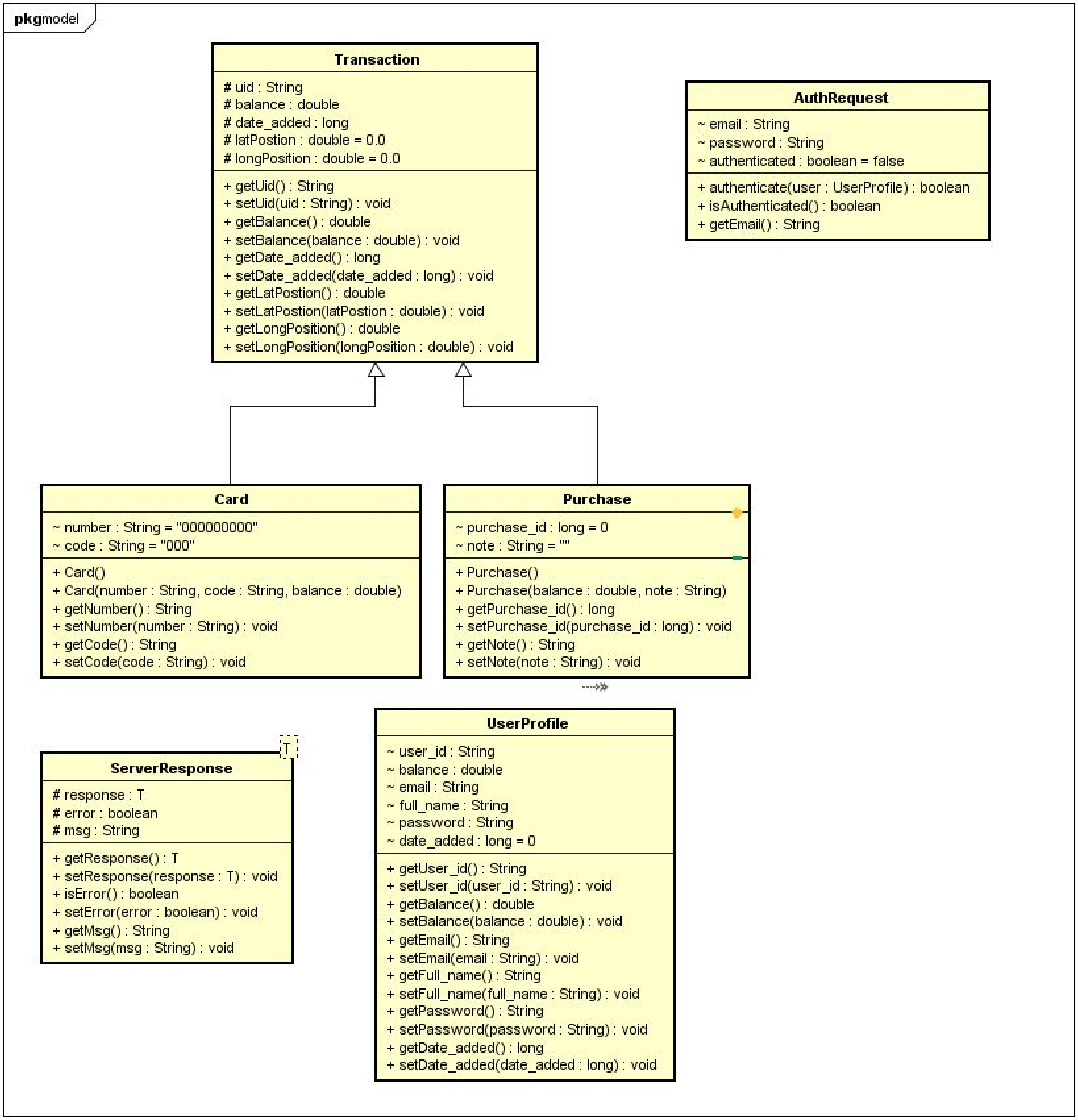
```
curl 'http://localhost:8080/api/v1/purchase' \
    -H 'Content-Type: application/json; charset=utf-8' \
    -H 'DNT: 1' --data-binary '{"uid":"958bbc20-cda2-4f57-9fe6-e1ecb6e6e913","balance":"3","note":"Iced
Coffee"}'
```

Response

https://github.com/nguyensjsu/su18-202-t3am/blob/master/starbucks2-domain/src/main/java/model/Purchase.java

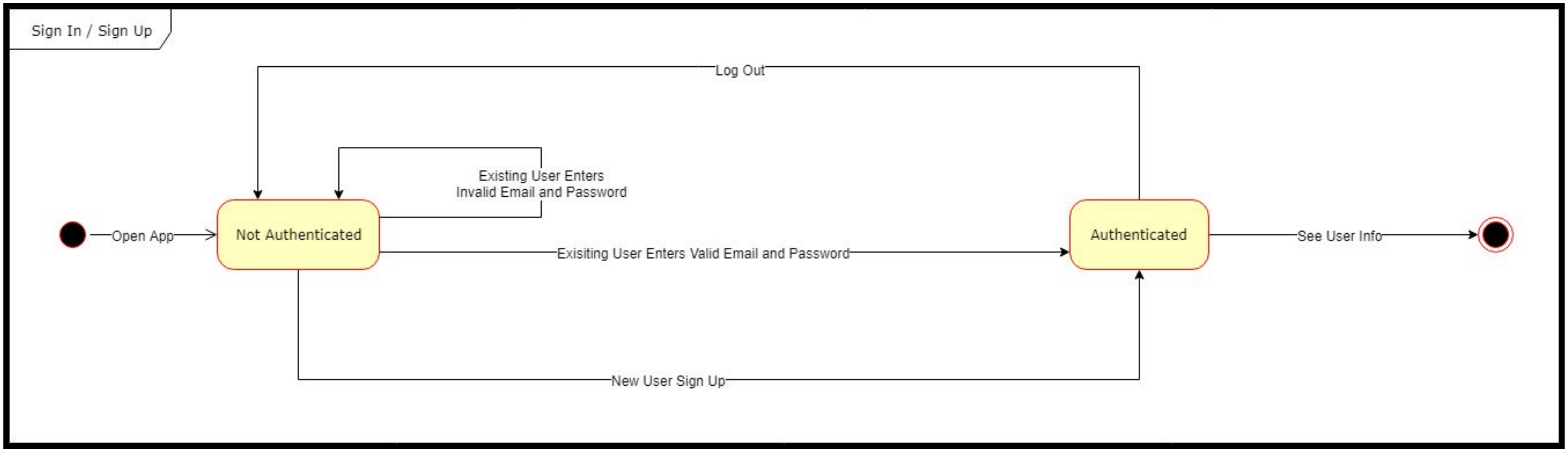
Class Design UML Diagrams



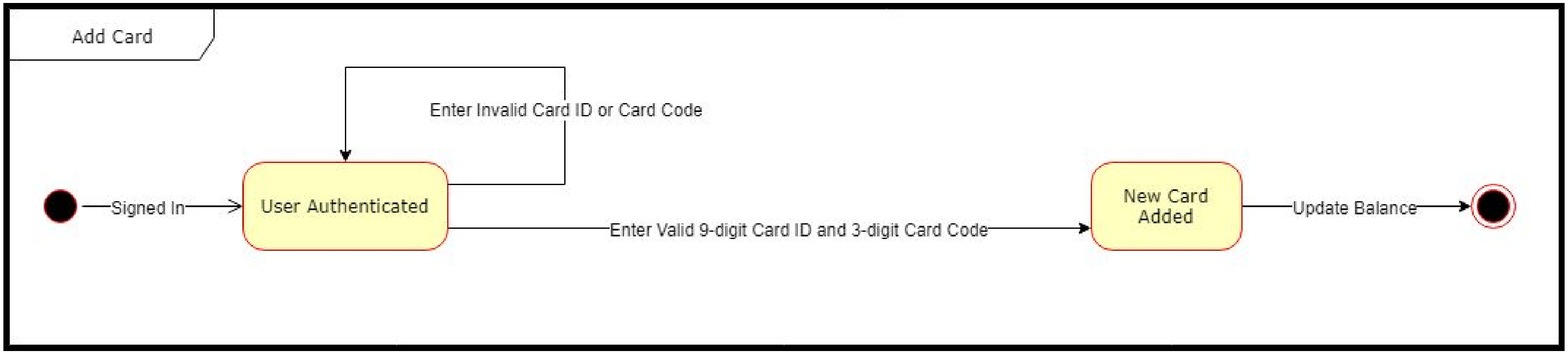

pkgmodel
Transaction
# uid : String
# balance : double
# date_added : long
# latPostion : double = 0.0
# longPosition : double = 0.0
+ getUid() : String
+ setUid(uid : String) : void
+ getBalance() : double
+ setBalance(balance : double) : void
+ getDate_added() : long
+ setDate_added(date_added : long) : void
+ getLatPostion() : double
+ setLatPostion(latPostion : double) : void
+ getLongPosition() : double
+ setLongPosition(longPosition : double) : void
AuthRequest
~ email : String
~ password : String
~ authenticated : boolean = false
+ authenticate(user : UserProfile) : boolean
+ isAuthenticated() : boolean
+ getEmail() : String
Card
~ number : String = "000000000"
~ code : String = "000"
+ Card()
+ Card(number : String, code : String, balance : double)
+ getNumber() : String
+ setNumber(number : String) : void
+ getCode() : String
+ setCode(code : String) : void
Purchase
~ purchase_id : long = 0
~ note : String = ""
+ Purchase()
+ Purchase(balance : double, note : String)
+ getPurchase_id() : long
+ setPurchase_id(purchase_id : long) : void
+ getNote() : String
+ setNote(note : String) : void
ServerResponse
T
# response : T
# error : boolean
# msg : String
+ getResponse() : T
+ setResponse(response : T) : void
+ isError() : boolean
+ setError(error : boolean) : void
+ getMsg() : String
+ setMsg(msg : String) : void
UserProfile
~ user_id : String
~ balance : double
~ email : String
~ full_name : String
~ password : String
~ date_added : long = 0
+ getUser_id() : String
+ setUser_id(user_id : String) : void
+ getBalance() : double
+ setBalance(balance : double) : void
+ getEmail() : String
+ setEmail(email : String) : void
+ getFull_name() : String
+ setFull_name(full_name : String) : void
+ getPassword() : String
+ setPassword(password : String) : void
+ getDate_added() : long
+ setDate_added(date_added : long) : void

State Diagrams

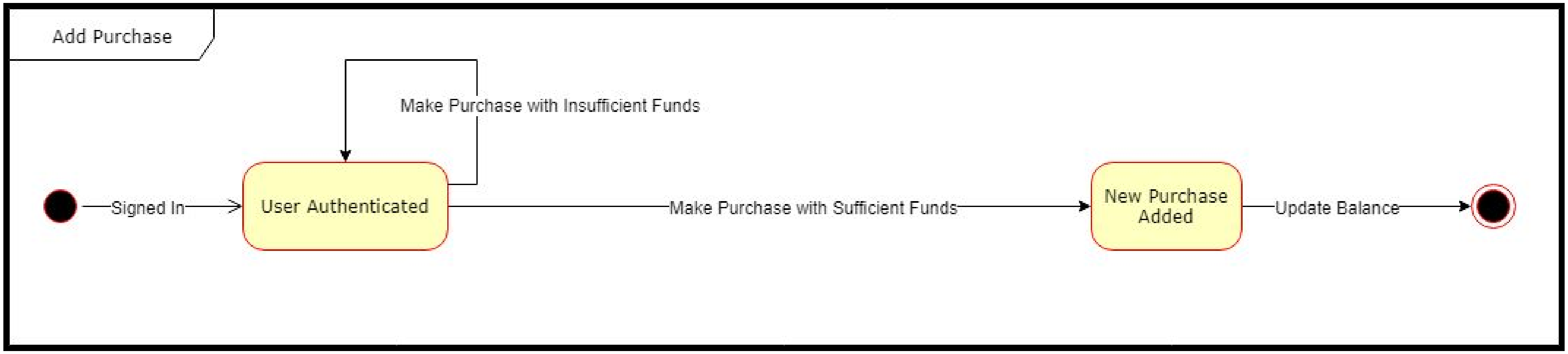
Sign In / Sign Up



Add Card


Add Card
Enter Invalid Card ID or Card Code
Signed In
User Authenticated
Enter Valid 9-digit Card ID and 3-digit Card Code
New Card Added
Update Balance

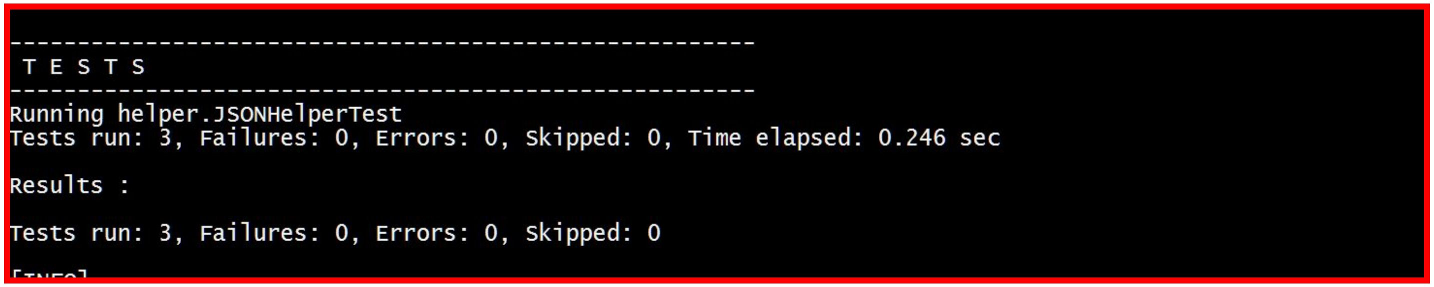
Add Purchase


Add Purchase
Make Purchase with Insufficient Funds
Signed In
User Authenticated
Make Purchase with Sufficient Funds
New Purchase Added
Update Balance

Unit Testings

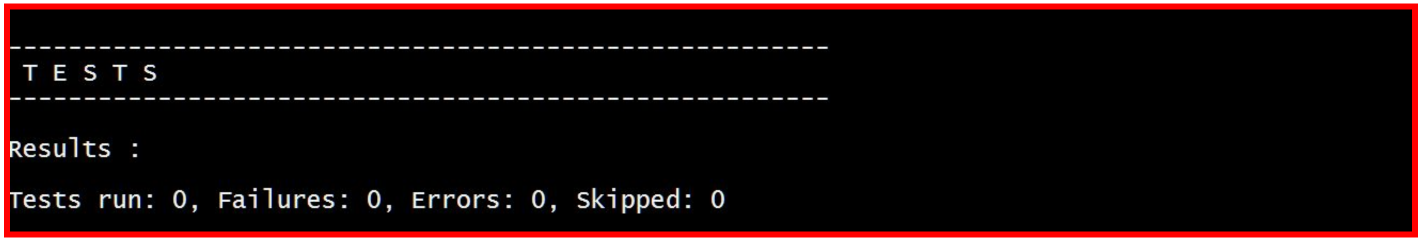
Java Unit Tests

Helper package JUnit



```
-------------------------------------------------------
 T E S T S
-------------------------------------------------------
Running helper.JSONHelperTest
Tests run: 3, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.246 sec

Results :

Tests run: 3, Failures: 0, Errors: 0, Skipped: 0

[INFO]
```

Model Package JUnit

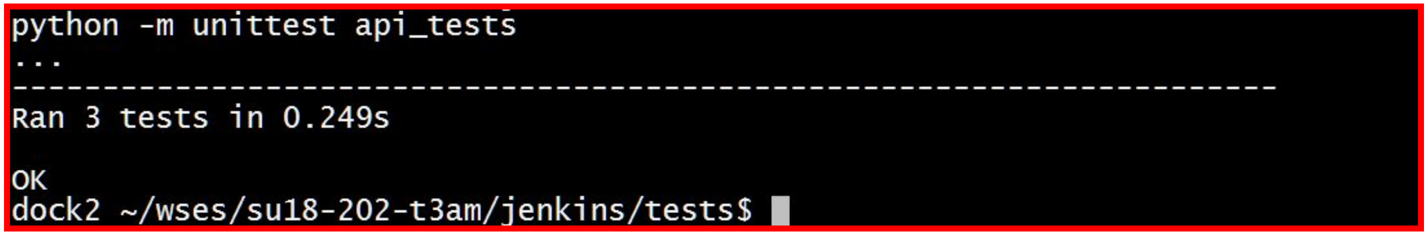


```
-------------------------------------------------------
 T E S T S
-------------------------------------------------------

Results :

Tests run: 0, Failures: 0, Errors: 0, Skipped: 0
```

Python End-To-End Tests

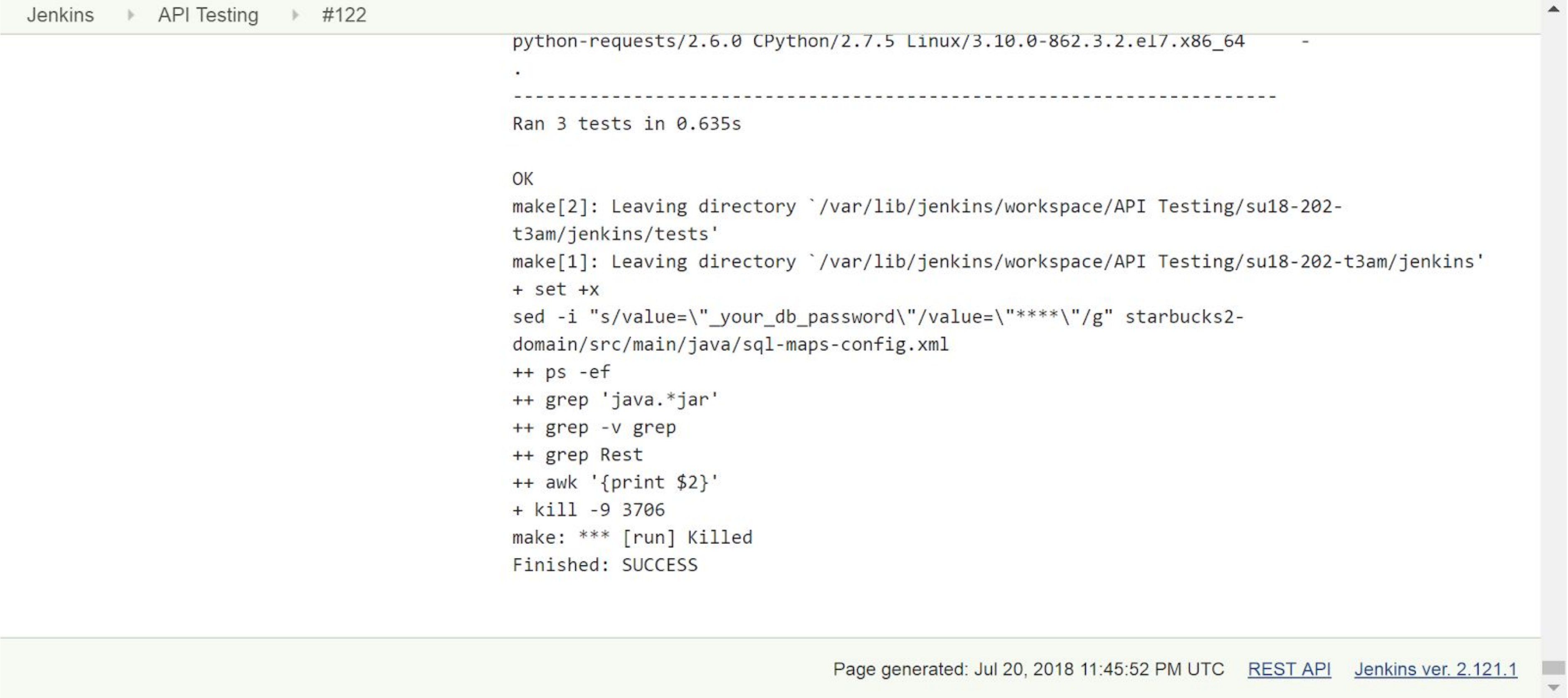
Workflow:

1. Run “mvn build” to build the JAR
2. Run the JAR, and start the backend server listening to localhost:8202
3. Run python test “api_tests” which send REST API requests to the localhost server
4. Verify that responses and fields match the expected results



```
python -m unittest api_tests
...
----------------------------------------------------------------------
Ran 3 tests in 0.249s

OK
dock2 ~/wses/su18-202-t3am/jenkins/tests$
```

Each Jenkins Job runs the python end-to-end tests. A screenshot of a successful run is shown below:



```
python-requests/2.6.0 CPython/2.7.5 Linux/3.10.0-862.3.2.el7.x86_64     -
.
----------------------------------------------------------------------
Ran 3 tests in 0.635s

OK
make[2]: Leaving directory `/var/lib/jenkins/workspace/API Testing/su18-202-
t3am/jenkins/tests'
make[1]: Leaving directory `/var/lib/jenkins/workspace/API Testing/su18-202-t3am/jenkins'
+ set +x
sed -i "s/value=\"_your_db_password\"/value=\"****\"/g" starbucks2-
domain/src/main/java/sql-maps-config.xml
++ ps -ef
++ grep 'java.*jar'
++ grep -v grep
++ grep Rest
++ awk '{print $2}'
+ kill -9 3706
make: *** [run] Killed
Finished: SUCCESS
```

Page generated: Jul 20, 2018 11:45:52 PM UTC   REST API   Jenkins ver. 2.121.1