MyPlaces Tracker

an innovative, data-driven Java application

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Enterprise Java Fall 2021

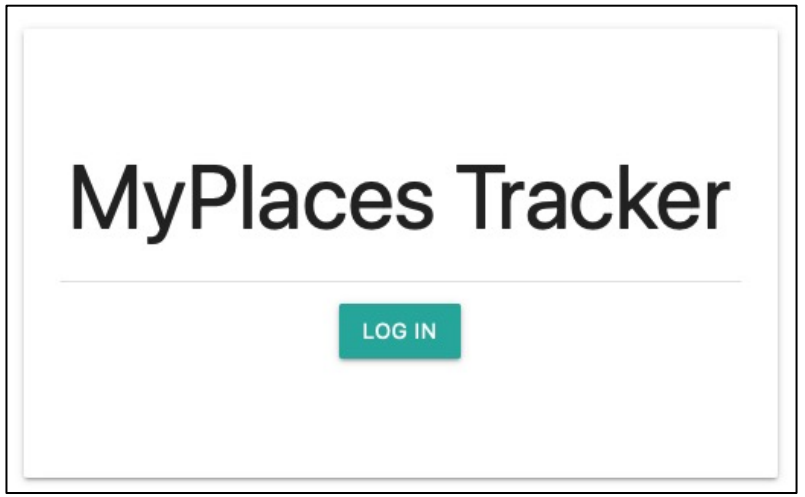
Solution to Real World Problem

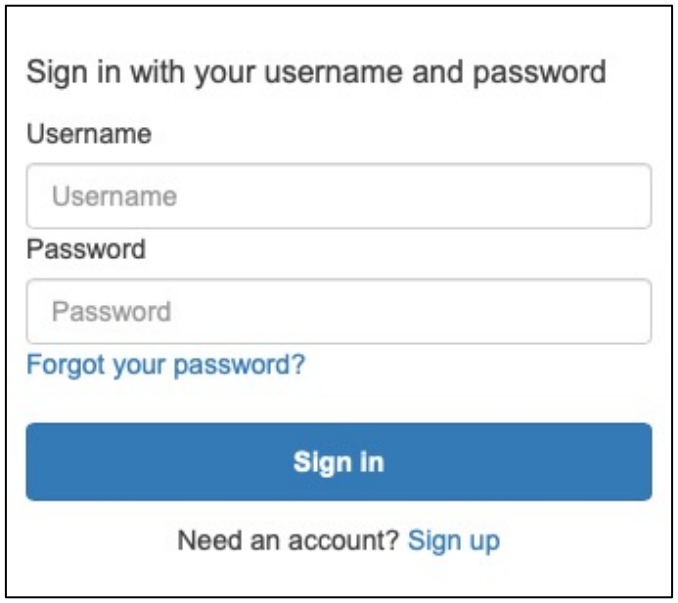
- A travel logistic site that provides important information about the places that travelers plan on visiting in one location
- Retrieves and displays local area health information such as collective hospital Intensive Care Unit (ICU) occupancy and the covid risk level for each of the traveler's destinations in a trip
- Enables users to write, view, update, and delete travel notes
- Functionality in future versions to include individual local hospital ICU occupancies, weather forecast information, and the ability to save information to a file which can be printed or viewed later in case of no internet connection
- Motivation for this topic: loved one visiting an overfilled ICU within the last year

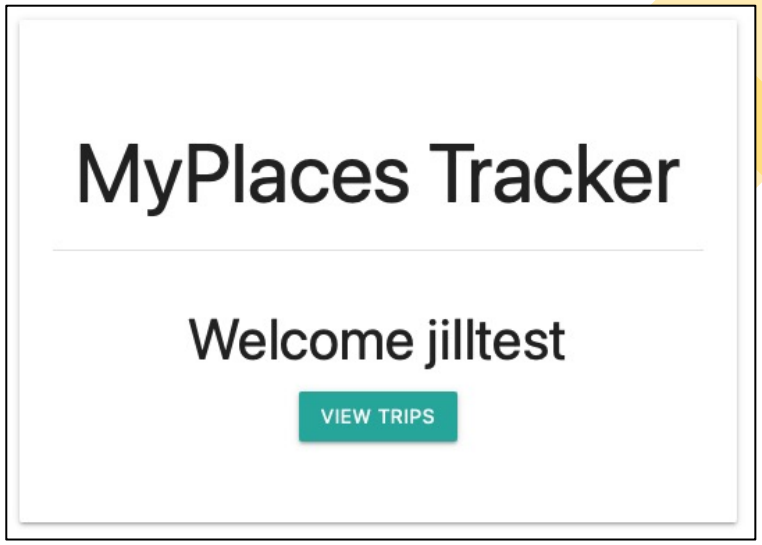
Technologies

Technology	Implementation
Language	Java
Integrated Development Environment (IDE)	IntelliJ IDEA
Dependency Management	Maven
ORM Framework	Hibernate
Unit Testing	JUnit 5 with 80%+ code coverage
Database	MySql 8.0.16
Security and Authentication	Amazon Web Services (AWS) Cognito
CSS	Materialize
Data Validation	Hibernate Validator
Hosting	AWS
Independent Research	AWS Code Pipeline
Web Services consumed using Java	SmartyStreets, Covid Act Now, Google Maps and NOAA (future version)

New User Registration and Login







RESTful APIs Consumed with Java

- smartystreets: https://www.smartystreets.com/products/apis/us-zipcode-api
- U.S. COVID Risk & Vaccine Tracker: https://covidactnow.org/

About - Location Risk Level and ICU Capacity Used

Our COVID risk level looks at three things: daily new cases (per 100K), infection rate, and positive test rate. Each is graded on a five-color scale and the highest risk color becomes the location's overall risk level. The one exception is that if a location's daily new cases is green, then its overall risk level is green.

We developed our risk framework in partnership with the Harvard Global Health Institute and Harvard Edmond J. Safra Center for Ethics. As there is not a standardized framework for risk in the U.S., it may not match your state or county's risk level.

Learn more about COVID risk levels.

ICU capacity used

ICU capacity used is the percentage of staffed intensive care unit (ICU) beds in a location's healthcare system that are currently in use by both COVID and non-COVID patients.

Experts indicate that during pre-pandemic years, average ICU occupancy in U.S. hospitals ranged from 57% to 82%.

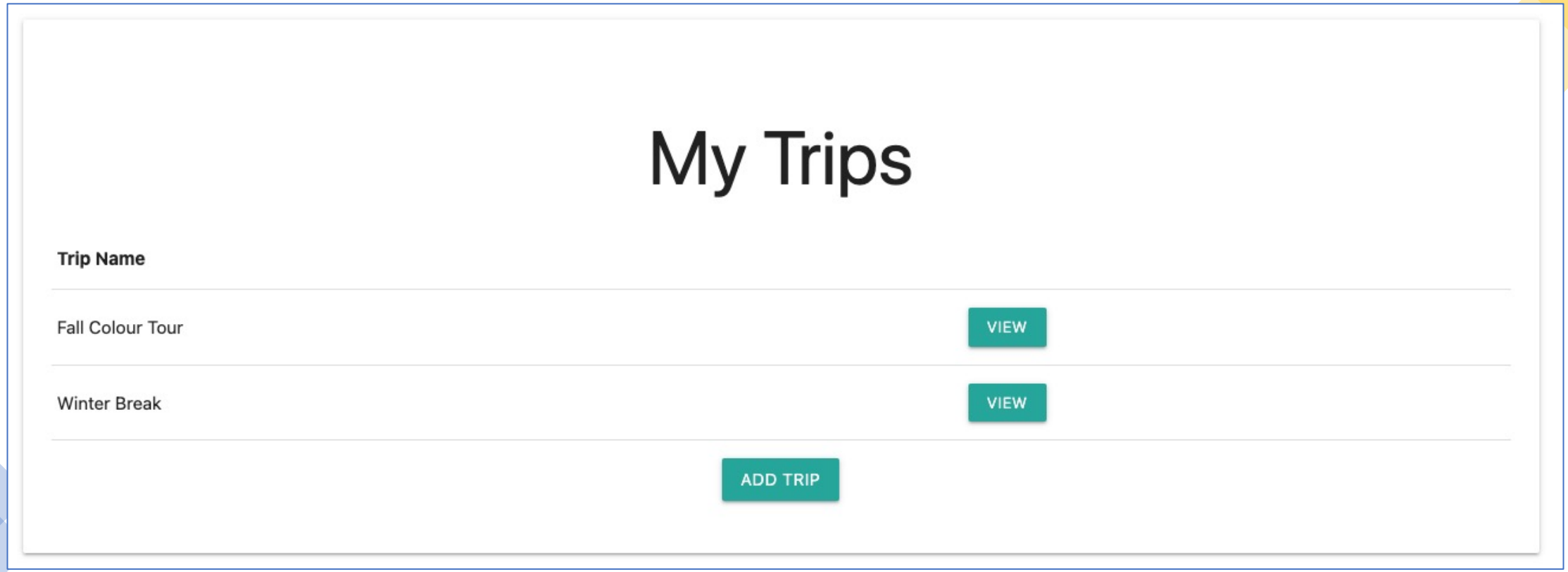
Data source

Our data for ICU capacity used in Miami-Fort Lauderdale-Pompano Beach comes from HHS Protect.

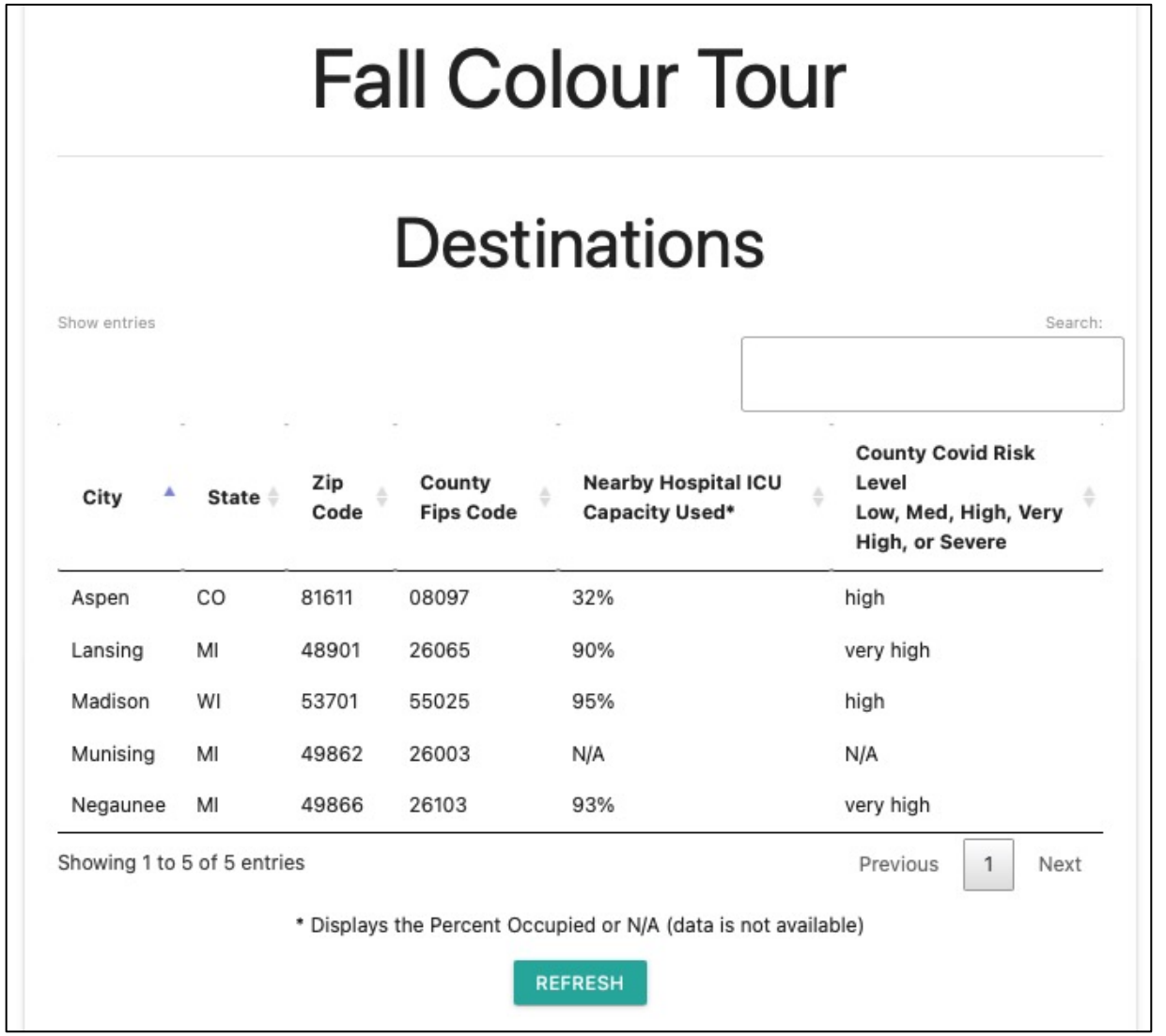
How it's calculated

ICU capacity used is the number of staffed ICU beds that are occupied (by both COVID and non-COVID patients), divided by the total number of staffed ICU beds.

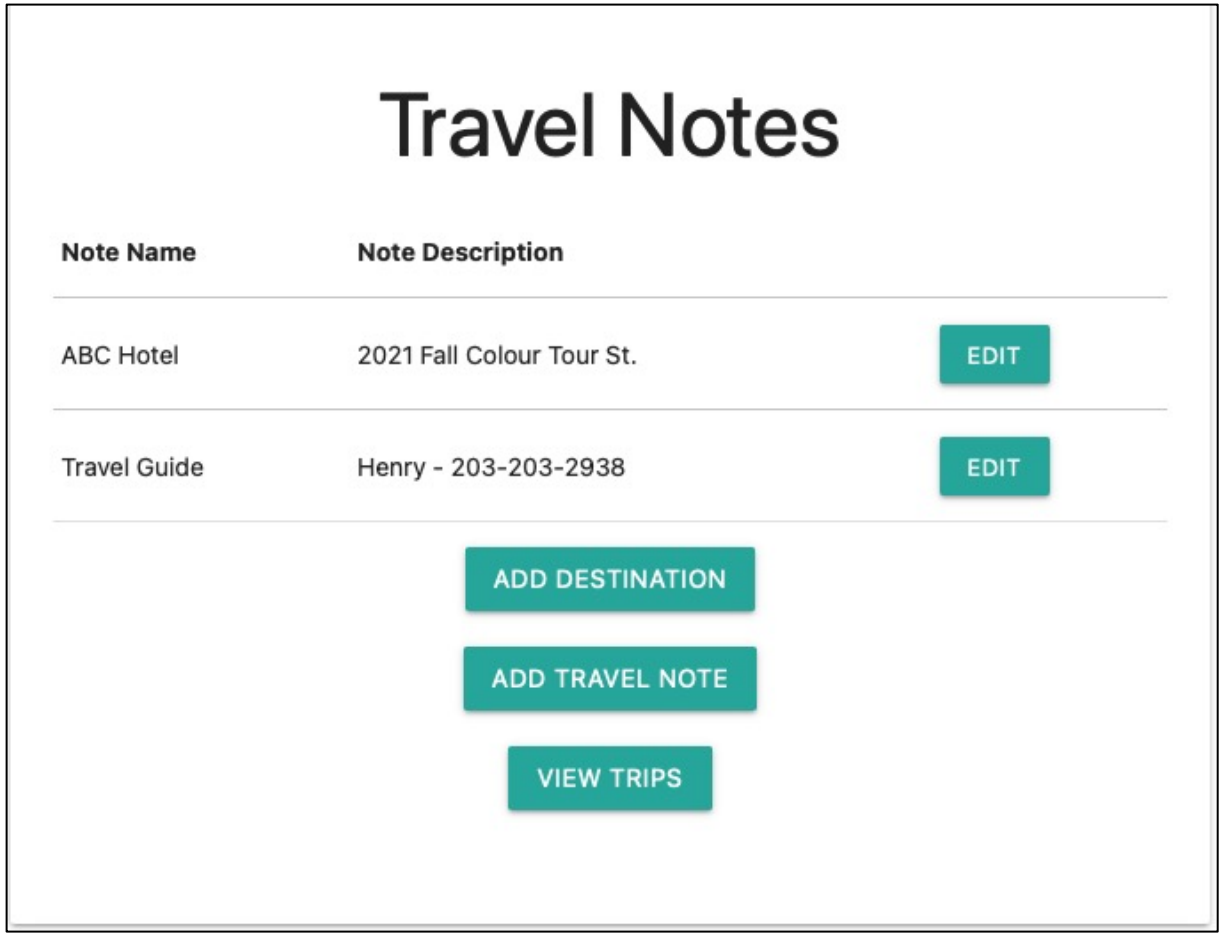
Minimum Viable Product (MVP)
Full CRUD of data – Travel Note
Partial CRUD – Trip and Destination

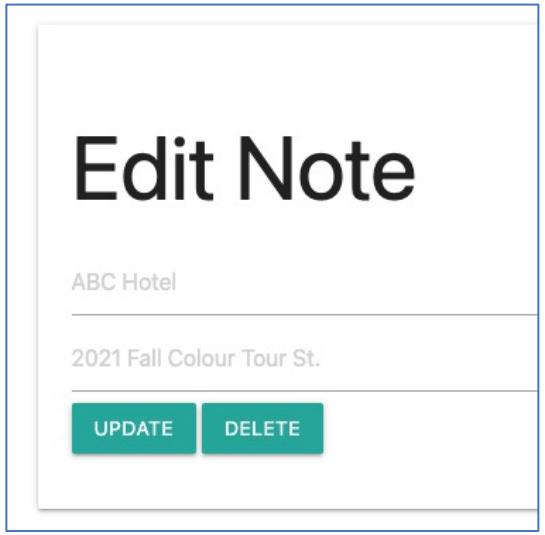


CRUD (continued)

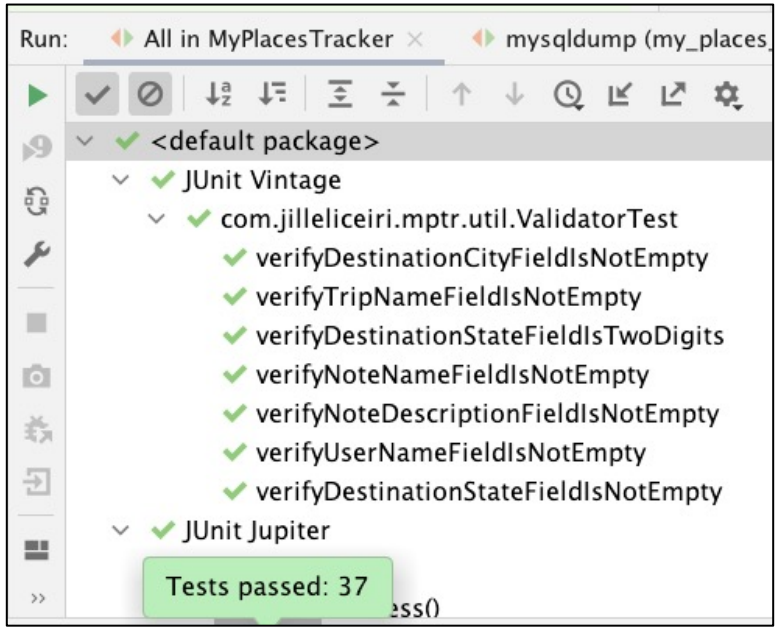


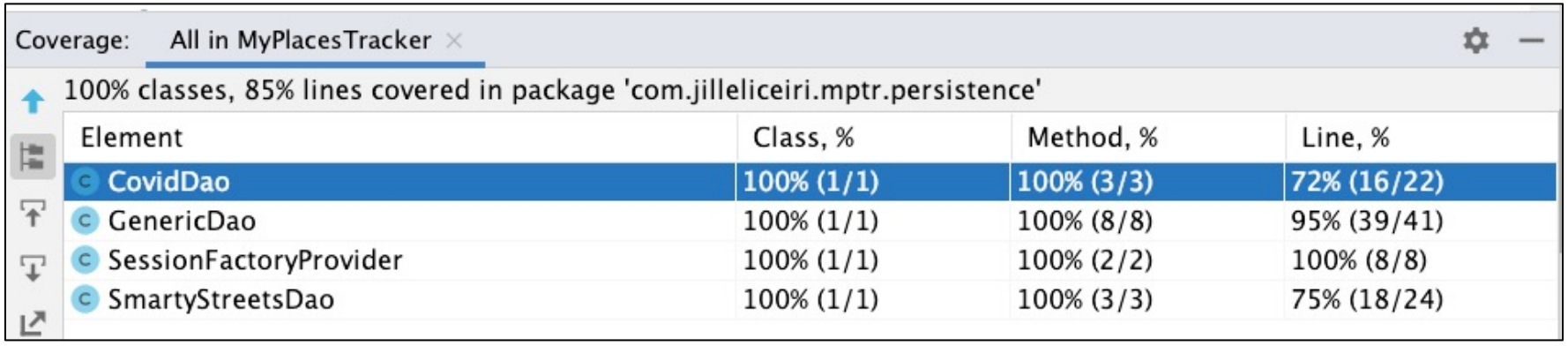
CRUD (continued)





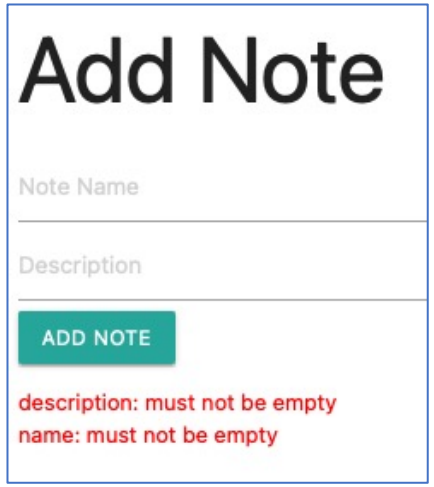
Code Coverage and Tests





Data Validation

- Backend Hibernate Validator
- Frontend Materialize class="validate" required



Error Handling

- Handle exceptions and display error messages in the same jsp or to an error.jsp

Logging

- Log4j2 Framework

log4j2.properties | Auth.java | ViewTrips.java | AddNoteForm.ja

```
1  #property.filename = logs
2  property.filepath = /Users/jk/IdeaProjects/MyPlacesTr
3  appenders = console, file, hibernate
4
5  appender.console.type = Console
6  appender.console.name = STDOUT
7  appender.console.layout.type = PatternLayout
8  appender.console.layout.pattern = [%-5level] %d{yyyy-
```

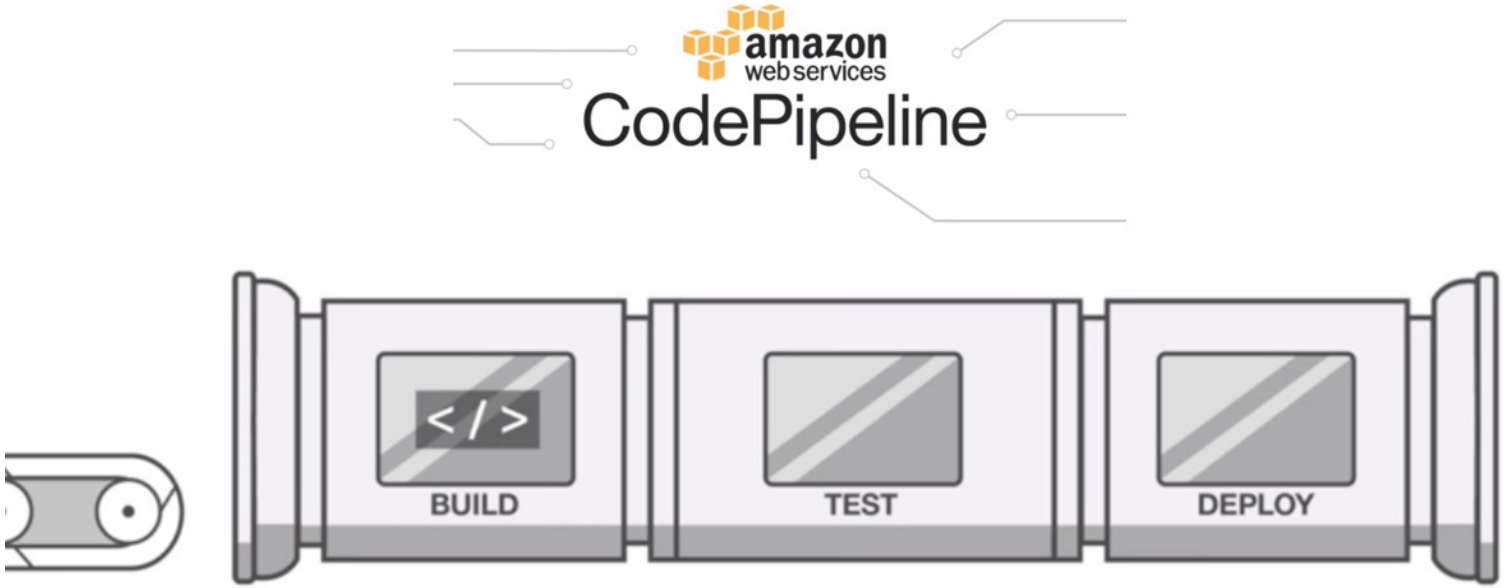
```
catch (Exception e) {
  page = "/error.jsp";
  logger.error( s: "Not able to Add Destination", e);
```

```
logger.debug( s: "userId, trips: {} {}", userId, tripSet);
```

```
[DEBUG] 2021-12-03 16:51:16.758 [http-nio-8080-exec-8] GenericDao - saveOrUpdate(): Destination{id=53,
```

New technologies learned outside of class: AWS CodePipeline and Codebuild

- A service that helps you practice continuous delivery to automate the steps to release software
- It builds, tests, and deploys your application



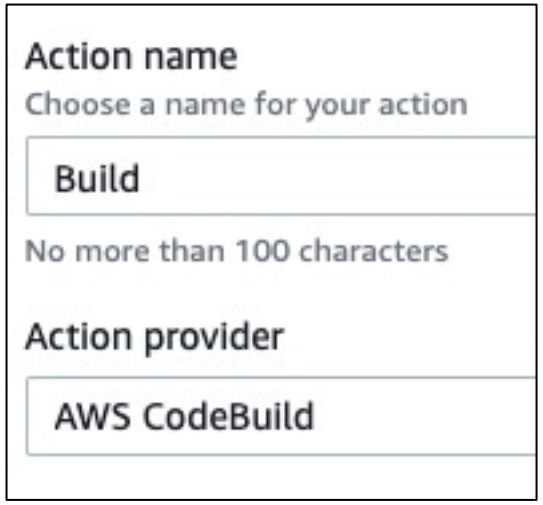
AWS CodePipeline and Codebuild

Source

-Connect to Github repo

aws AWS Connector for GitHub

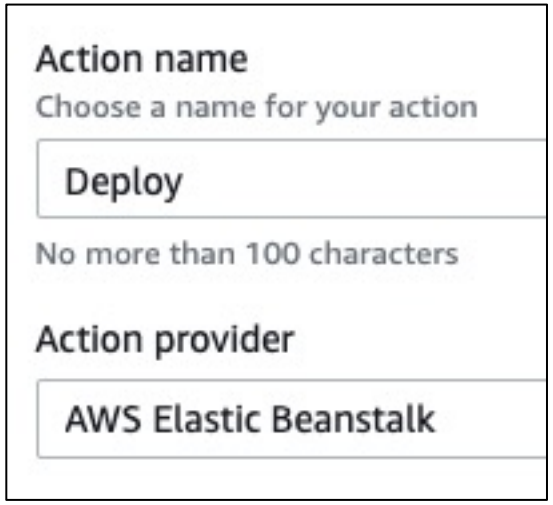
CodeBuild



-add buildspec.yml to project

-code is compiled and unit tested

Deploy



-EB handles deploying the code to the EC2 instance

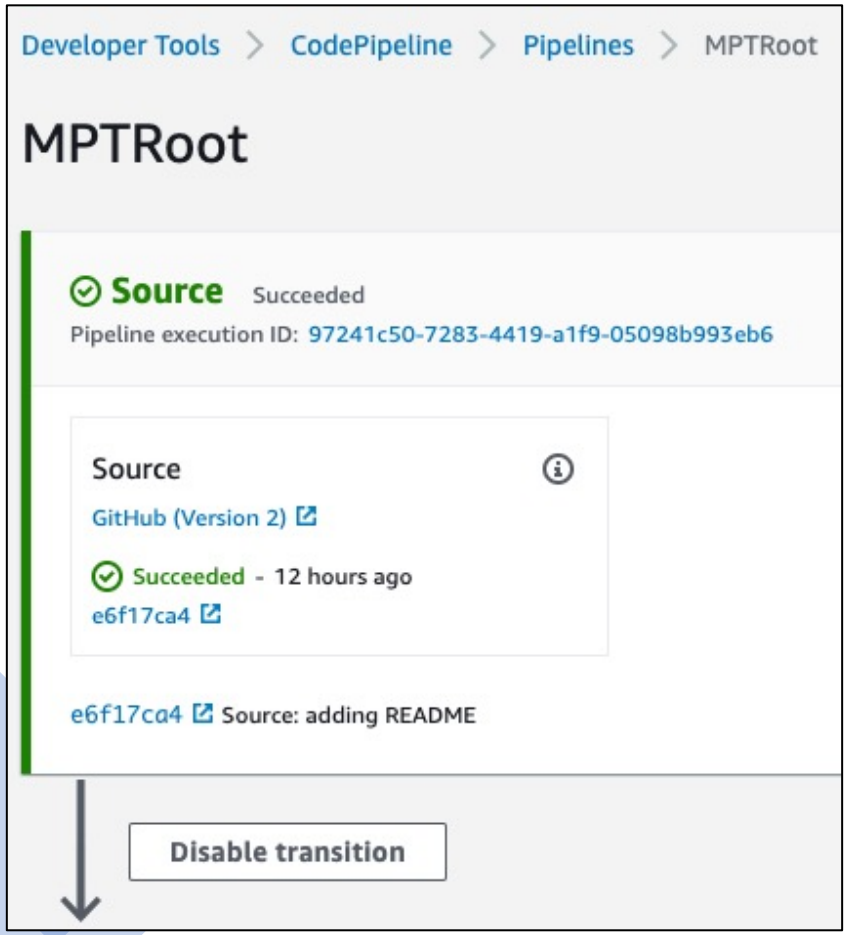
buildspec.yml

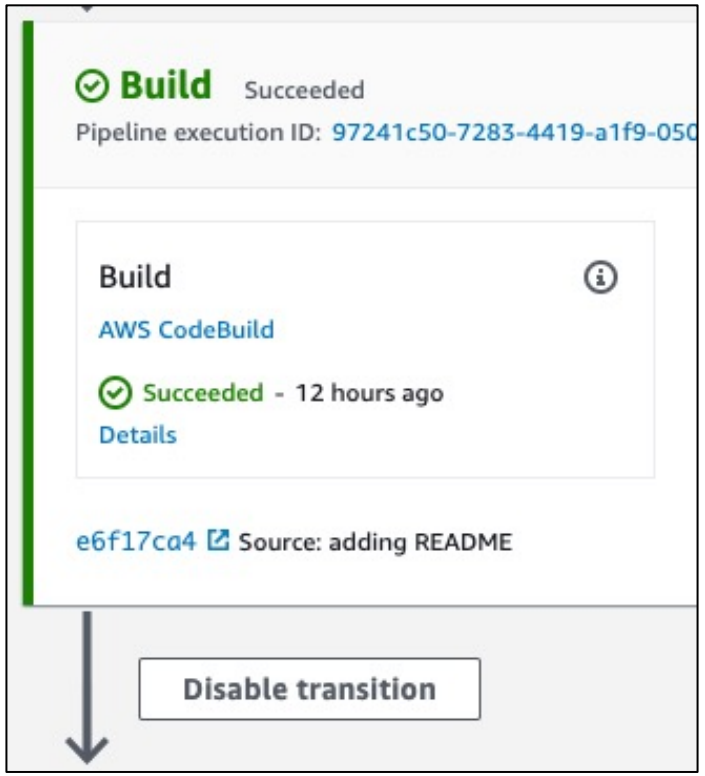
- AWS Elastic Beanstalk did not unpack the WAR file that was contained in a ZIP file
- Solution: the post-build command unzips it and moves it to the root folder in AWS tomcat/webapps/

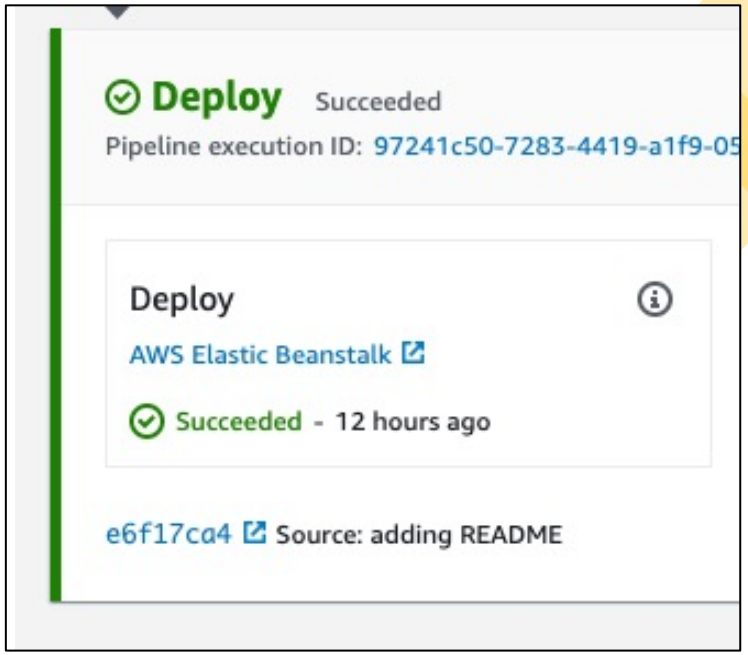
```yaml
version: 0.2

phases:
  install:
    runtime-versions:
      java: corretto11
  post_build:
    commands:
      - mvn package
      - unzip target/ROOT.war -d .
artifacts:
  files:
    - '**/*'
```

AWS CodePipeline (continued)







Future Improvements

- Location API
- Weather forecast
- Individual hospital capacity
- Save to file on device
- Share with a friend
- Travelers choose which Destination fields are important to them

References

- https://docs.jboss.org/hibernate/stable/validator/reference/en-US/html_single/#preface
- https://materializecss.com/
- https://docs.aws.amazon.com/codebuild/latest/userguide/sample-elastic-beanstalk.html
- http://paulawaite.com/education/java113/index.html