

COMP 504: Graduate Object-Oriented Programming and Design

Lecture 6: Hosting on Heroku

Mack Joyner (mjoyner@rice.edu)

<https://www.clear.rice.edu/comp504>



Announcements & Reminders

- HW #1 is due **today by 11:59pm**
- Use Piazza (public or private posts, as appropriate) for all communications re. COMP 504
 - Do not include code in a public post (**could be considered an honor code violation**)
- See course web site for syllabus, work assignments, due dates, office hours schedule.



In-Class Exercises

- We'll have 1 each week (1st half of semester)
- Based on material presented in the lecture
- Grade rubric
 - 1 = submit before end of class
 - 1 = submit before beginning on next class
- Submit in-class exercises in git repo
- Place name is README.md file



In-Class Exercise 2 GitHub Repo

GitHub ex2 repo: <https://classroom.github.com/a/pM-Ov0Fu>



In-Class Exercise 2: Hosting on Heroku

Exercise 2 handout is in Piazza

- Understanding how to host a web app
- Host hw #1 starter code on Heroku



Deploying Spark Java on Heroku (JAR file)

- Heroku needs app jar file with dependencies to deploy app
- Configure Maven to produce jar file
 - create jar file in pom.xml (execution phase: *package*)
 - ensure assembly done during build (execution goal: *single*)
 - predefined descriptor (*descriptorRef*) to include dependencies
 - tell archiver which main class to use (*edu.rice.comp504.controller.SimpleShapesController*)

```
<plugin>
  <artifactId>maven-assembly-plugin</artifactId>
  <executions>
    <execution>
      <phase>package</phase>
      <goals>
        <goal>single</goal>
      </goals>
    </execution>
  </executions>
  <configuration>
    <descriptorRefs>
      <!-- This tells Maven to include all dependencies -->
      <descriptorRef>jar-with-dependencies</descriptorRef>
    </descriptorRefs>
    <archive>
      <manifest>
        <mainClass>Main</mainClass>
      </manifest>
    </archive>
  </configuration>
</plugin>
```

For more information: <http://sparkjava.com/tutorials/heroku>



Deploying Spark Java on Heroku (Heroku App)

- Create a new Heroku application in your hw directory (unique name)
 >> heroku create [netid]-ex2-shape-world
- Configure Heroku plugin to launch app
 - will use JDK 11
 - replace appName spark-heroku-example with [netid]-ex2-shape-world
- Replace my-app-1.0...jar name with ex2-1.0-SNAPSHOT-jar-with-dependencies.jar

```
<plugin>
  <groupId>com.heroku.sdk</groupId>
  <artifactId>heroku-maven-plugin</artifactId>
  <version>0.4.4</version>
  <configuration>
    <jdkVersion>1.8</jdkVersion>
    <!-- Use your own application name -->
    <appName>spark-heroku-example</appName>
    <processTypes>
      <!-- Tell Heroku how to launch your application -->
      <!-- You might have to remove the ./ in front -->
      <web>java -jar ./target/my-app-1.0-jar-with-dependencies.jar</web>
    </processTypes>
  </configuration>
</plugin>
```



Deploying Spark Java on Heroku (Port)

- Heroku assigns port number every time app is deployed.
- Listen for correct port number

```
import static spark.Spark.*;

public class Main {

    public static void main(String[] args) {
        port(getHerokuAssignedPort());
        get("/hello", (req, res) -> "Hello Heroku World");
    }

    static int getHerokuAssignedPort() {
        ProcessBuilder processBuilder = new ProcessBuilder();
        if (processBuilder.environment().get("PORT") != null) {
            return Integer.parseInt(processBuilder.environment().get("PORT"));
        }
        return 4567; //return default port if heroku-port isn't set (i.e. on local machine)
    }
}
```

For more information: <http://sparkjava.com/tutorials/heroku>



Deploying Spark Java on Heroku

- Deploy app on heroku
 - cd to project directory (i.e. ex2)
 - set maven bin dir (e.g. /Users/mjoyner/apache-maven-3.5.2)
`>> PATH=$PATH:/Users/mjoyner/apache-maven-3.5.2/bin`
 - Run maven heroku app deploy
`>> mvn heroku:deploy`
- Open browser: <https://app-name.herokuapp.com> where app-name is the web app name



Heroku Hosting Errors

Take a look at the heroku logs if you get an application error

```
C1MS80M4H3QJ:ex2 mjoyner$ heroku logs --tail -a mrj1-ex2-shape-world
> Warning: heroku update available from 7.35.0 to 7.42.13.
2020-09-01T04:10:21.461492+00:00 app[api]: Initial release by user mjoyner@rice.edu
2020-09-01T04:10:21.461492+00:00 app[api]: Release v1 created by user mjoyner@rice.edu
2020-09-01T04:10:21.752441+00:00 app[api]: Release v2 created by user mjoyner@rice.edu
2020-09-01T04:10:21.752441+00:00 app[api]: Enable Logplex by user mjoyner@rice.edu
2020-09-01T04:37:30.000000+00:00 app[api]: Build started by user mjoyner@rice.edu
2020-09-01T04:37:42.000000+00:00 app[api]: Build succeeded
2020-09-01T04:37:42.351987+00:00 app[api]: Deploy e2e9e485 by user mjoyner@rice.edu
2020-09-01T04:37:42.351987+00:00 app[api]: Release v3 created by user mjoyner@rice.edu
2020-09-01T04:37:42.369168+00:00 app[api]: Scaled to web@1:Free by user mjoyner@rice.edu
2020-09-01T04:37:46.373924+00:00 heroku[web.1]: Starting process with command `java -jar ./ex2-1.0-SNAPSHOT-jar-with-dependencies.jar`
2020-09-01T04:37:49.332154+00:00 app[web.1]: Setting JAVA_TOOL_OPTIONS defaults based on dyno size. Custom settings will override them.
2020-09-01T04:37:49.334737+00:00 app[web.1]: Error: Unable to access jarfile ./ex2-1.0-SNAPSHOT-jar-with-dependencies.jar
2020-09-01T04:37:49.403957+00:00 heroku[web.1]: Process exited with status 1
2020-09-01T04:37:49.447582+00:00 heroku[web.1]: State changed from starting to crashed
2020-09-01T04:37:49.450246+00:00 heroku[web.1]: State changed from crashed to starting
2020-09-01T04:37:52.608971+00:00 heroku[web.1]: Starting process with command `java -jar ./ex2-1.0-SNAPSHOT-jar-with-dependencies.jar`
2020-09-01T04:37:54.277372+00:00 app[web.1]: Setting JAVA_TOOL_OPTIONS defaults based on dyno size. Custom settings will override them.
2020-09-01T04:37:54.278885+00:00 app[web.1]: Error: Unable to access jarfile ./ex2-1.0-SNAPSHOT-jar-with-dependencies.jar
2020-09-01T04:37:54.320293+00:00 heroku[web.1]: Process exited with status 1
```

