

Deployment

Lab-12a
Deploy



Deploy a Play Application to the
cloud

Development Mode

The image shows a development environment for a Play Framework application. On the left, an IDE window displays the project structure and the source code for `Dashboard.java`. The code includes package declarations, imports, and several `public static void` methods for handling requests. A terminal window at the bottom left shows the command `play run` being executed, with the output indicating that the application is running on port 9000. On the right, a browser window shows the application running at `localhost:9000/dashboard`. The application displays a 'homer simpson's Todo List' with two items: 'Make tea' and 'Go for snooze', each with a 'Delete' button. Below the list is a form to add a new todo item, with a label 'Title', an input field, and an 'Add Todo' button. A text box at the bottom right of the image states 'Application running on http://localhost:9000' with a blue arrow pointing to the browser window.

Development Mode

The IDE shows a project named 'todolist' with a structure including 'controllers', 'models', 'views', 'conf', and 'test'. The 'test' directory is highlighted. The terminal window shows the following output:

```
~  
~  
~  
~  
~  
~ play! 1.5.0, https://www.playframework.com  
~  
~ Ctrl+C to stop  
~  
~ using java version "1.8.0_162"  
Listening for transport dt_socket at address: 8000  
May 03, 2018 9:10:59 AM play.Logger warn  
WARNING: Cannot replace DATABASE_URL in configuration (db=${DATABASE_URL})  
09:10:59,374 INFO ~ Starting /Users/edelestar/repos/wit-hdip-comp-sci/web-dev  
09:10:59,468 WARN ~ You're running Play! in DEV mode  
09:10:59,558 INFO ~ Listening for HTTP on port 9000 (Waiting a first request to  
~ Server is up and running
```

play run

The H2 Console interface shows a list of tables: member, member_todo, todo, information_schema, Sequences, and Users. Below the table list, there is a section for 'Important Commands' and a 'Sample SQL Script' section.

Command	Description
?	Displays this Help Page
↑	Shows the Command History
Ctrl+Enter	Executes the current SQL statement
Shift+Enter	Executes the SQL statement defined by the text selection
Ctrl+Space	Auto complete
🔌	Disconnects from the database

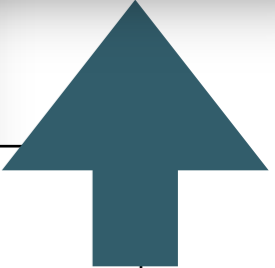
Sample SQL Script

Delete the table if it exists	DROP TABLE IF EXISTS TEST;
Create a new table with ID and NAME columns	CREATE TABLE TEST(ID INT PRIMARY KEY, NAME VARCHAR(255));
Add a new row	INSERT INTO TEST VALUES(1, 'Hello');
Add another row	INSERT INTO TEST VALUES(2, 'World');
Query the table	SELECT * FROM TEST ORDER BY ID;
Change data in a row	UPDATE TEST SET NAME='Hi' WHERE ID=1;
Remove a row	DELETE FROM TEST WHERE ID=2;
Help	HELP ...

Adding Database Drivers

Additional database drivers can be registered by adding the Jar file location of the driver to the the environment variables H2DRIVERS or CLASSPATH. Example (Windows): to add the database driver library C:/Programs/hsqldb/lib/hsqldb.jar, set the environment variable H2DRIVERS to C:/Programs/hsqldb/lib/hsqldb.jar.

Database visible on <http://localhost:9000/@db>



https://en.wikipedia.org/wiki/Software_deployment


Software deployment is all of the activities that make a **software system** available for use.


The general deployment process consists of several interrelated activities with possible transitions between them.

Transition from *Development Mode* to *Production Mode*



Deploying a Play Application

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Deploy a Play Application to the cloud

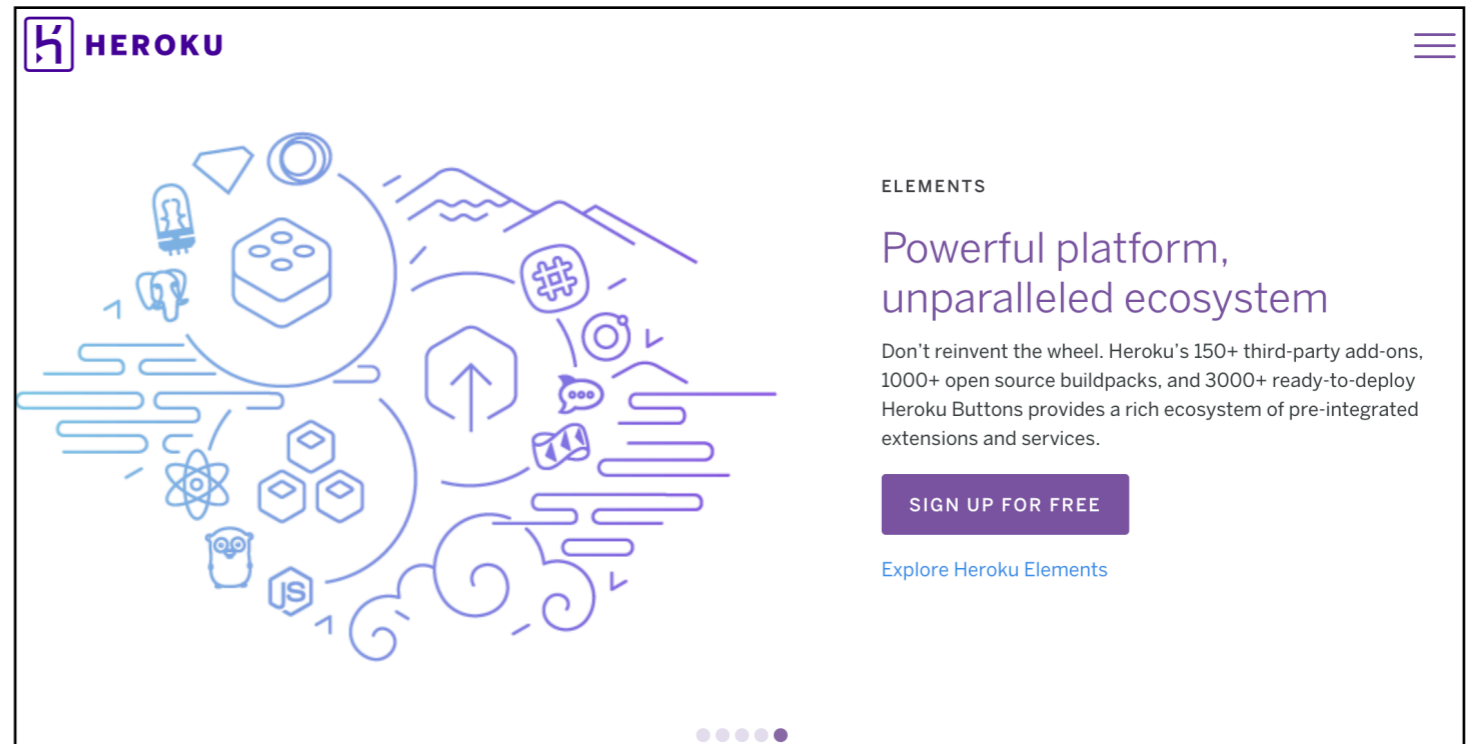
1. Configuration

2. Staging

3. Deployment

Deployment: Platforms & Tools

Heroku: Application Service Provider



The image shows the top portion of the Heroku website. On the left is the Heroku logo. The main area features a large, stylized illustration of a globe with various icons representing different services and technologies. To the right of the illustration, the text reads "ELEMENTS Powerful platform, unparalleled ecosystem". Below this, a paragraph describes Heroku's ecosystem of add-ons, buildpacks, and buttons. A prominent purple button says "SIGN UP FOR FREE", and a link below it says "Explore Heroku Elements".

HEROKU

ELEMENTS

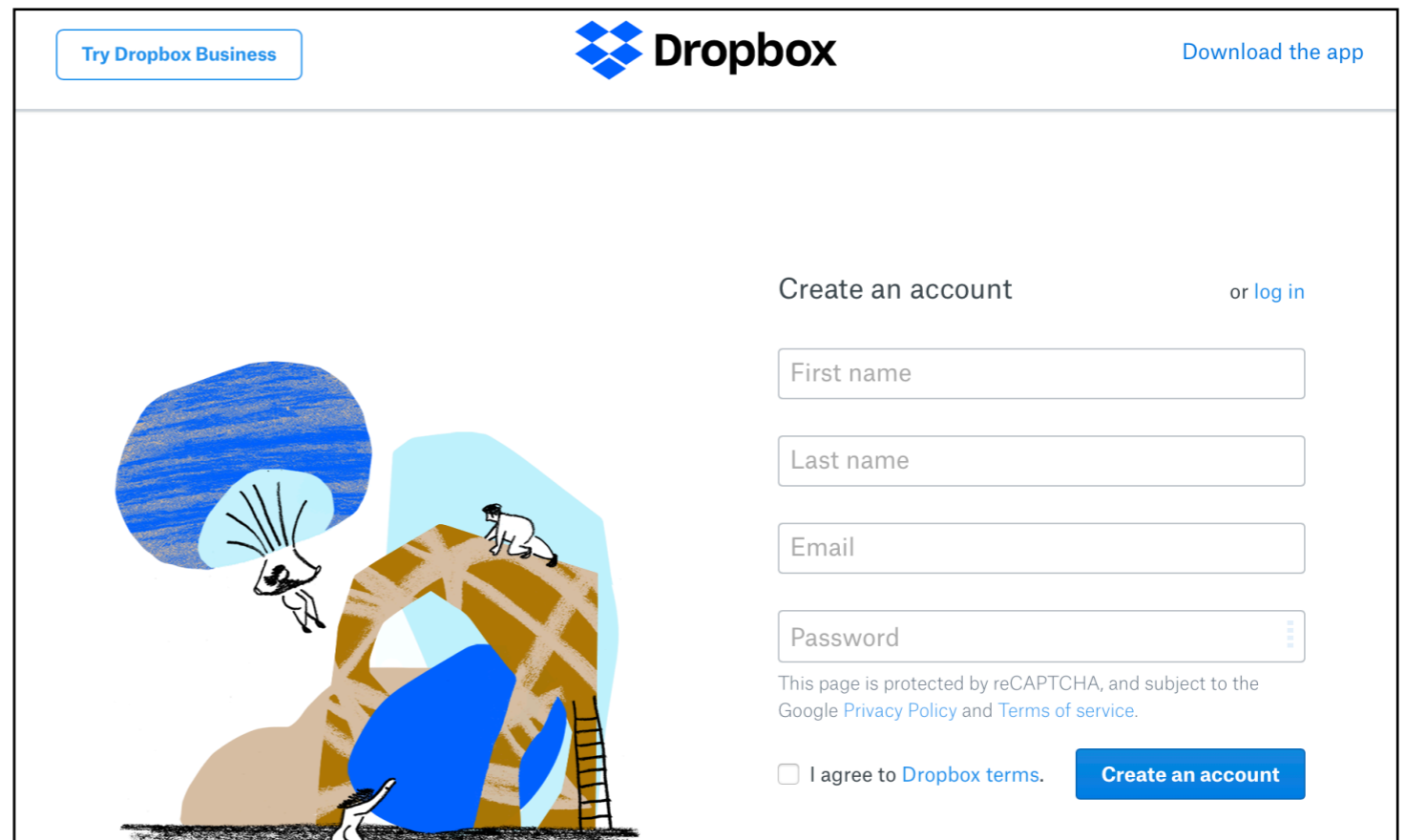
Powerful platform, unparalleled ecosystem

Don't reinvent the wheel. Heroku's 150+ third-party add-ons, 1000+ open source buildpacks, and 3000+ ready-to-deploy Heroku Buttons provides a rich ecosystem of pre-integrated extensions and services.

[SIGN UP FOR FREE](#)

[Explore Heroku Elements](#)

Dropbox: Cloud File Sharing service



The image shows the sign-up page for Dropbox. At the top, there are links for "Try Dropbox Business" and "Download the app". The main heading is "Create an account" with a link for "or log in". Below this are four input fields: "First name", "Last name", "Email", and "Password". A note below the fields states: "This page is protected by reCAPTCHA, and subject to the Google Privacy Policy and Terms of service." At the bottom, there is a checkbox for "I agree to Dropbox terms." and a blue "Create an account" button. On the left side of the page, there is a colorful illustration of a person climbing a mountain with a ladder, and another person sitting on a rock.

[Try Dropbox Business](#) **Dropbox** [Download the app](#)

Create an account [or log in](#)

First name

Last name


Email


Password

This page is protected by reCAPTCHA, and subject to the [Google Privacy Policy](#) and [Terms of service](#).

I agree to [Dropbox terms](#). [Create an account](#)

Deploying a Play Application

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Deploy a Play Application to the
cloud

1. Configuration

Three Key Configuration Parameters

1.1- JDK Version

1.2- Play Version

1.3- Database Connection String

1-1. JDK Version

1. Configuration

<https://devcenter.heroku.com/articles/java-support>

Heroku
supports
multiple
versions of the
JDK

Supported Java versions

Heroku currently uses OpenJDK 8 to run your application by default. OpenJDK versions 9 and 7 are also available. Depending on the major version you select the latest available update of that JDK will be used each time you deploy your app.

Current default versions are:

- Java 7 - 1.7.0_171
- Java 8 - 1.8.0_161
- Java 9 - 9.0.4
- Java 10 - 10

system.properties

Place this file in project root:

```
java.runtime.version=8
```


1-2. Play Version

1. Configuration

<https://www.playframework.com/download#alternatives>

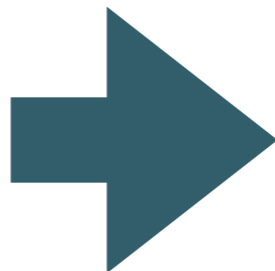
Play Application Framework Versions

1.5 Setup Instructions		
play-1.5.0.zip	Sep 29 2017	79M
1.4 Setup Instructions		
play-1.4.5.zip	Sep 29 2017	74.6M
play-1.4.4.zip	Jan 24 2017	73.1M
play-1.4.3.zip	Aug 16 2016	72.3M
Show all versions		

Edit existing file:

conf/dependencies.yml

```
# Application dependencies
require:
- play
```



```
# Application dependencies
require:
- play 1.5.0
- org.postgresql -> postgresql 42.2.2:
  force: true
```

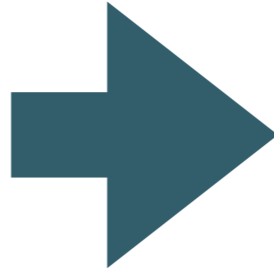
1-3. Database Connection String

1. Configuration

Edit existing file:

conf/application.conf

```
db.default=mem
```



```
# db.default=mem
```

```
db=${DATABASE_URL}
```


```
jpa.dialect=org.hibernate.dialect.PostgreSQLDialect
```


```
jpa.ddl=update
```

Dev mode
Application
connected to in
memory database

Production Mode
Application connected to
Postgres Database,
specified by platform

Deploying a Play Application

Lab-12a 
Deploy



Deploy a Play Application to the cloud

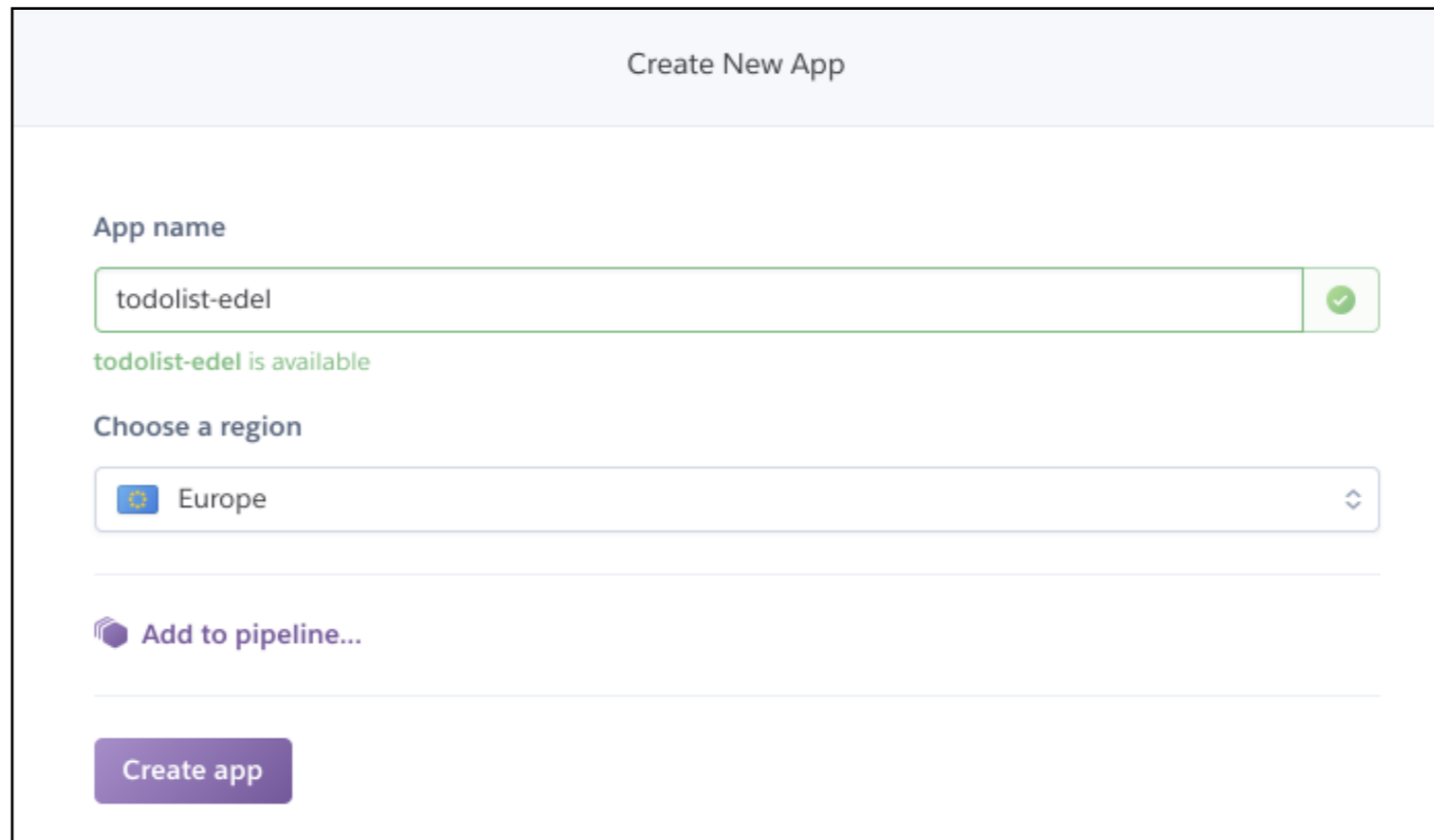
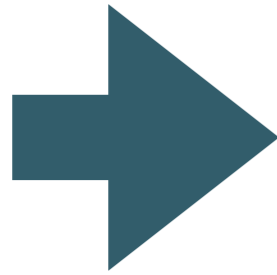
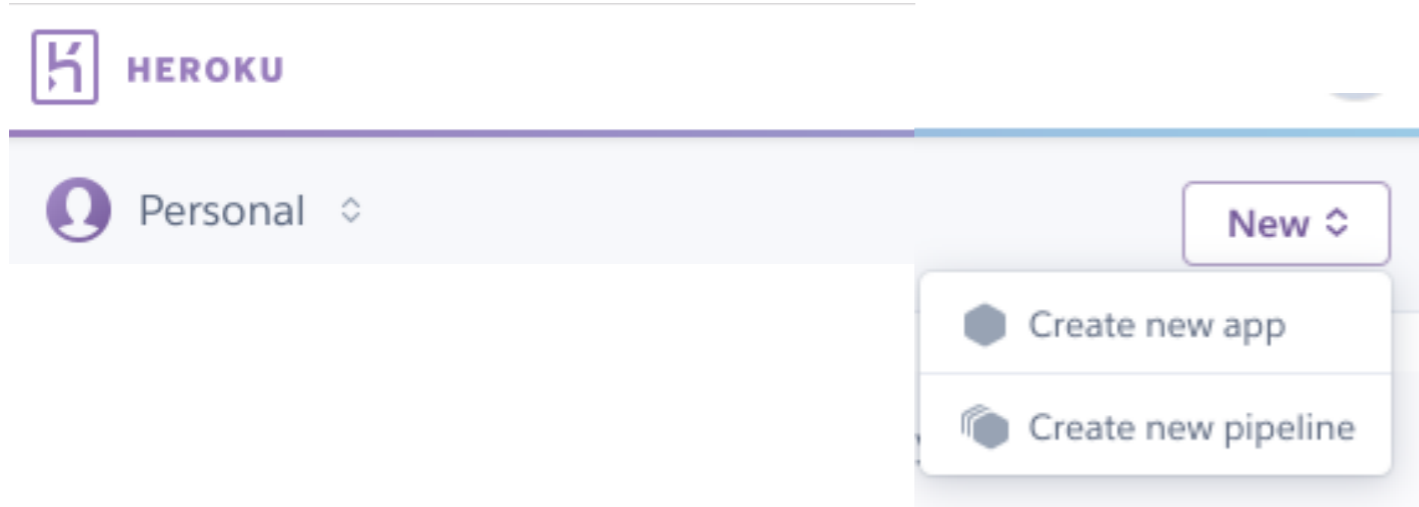
2.Staging

Three Processes:

- 2.1- Create the Application
- 2.2- Connect to Dropbox
- 2.3- Copy project to dropbox
- 2.4- Configure Play Build pack

2.1- Create Application

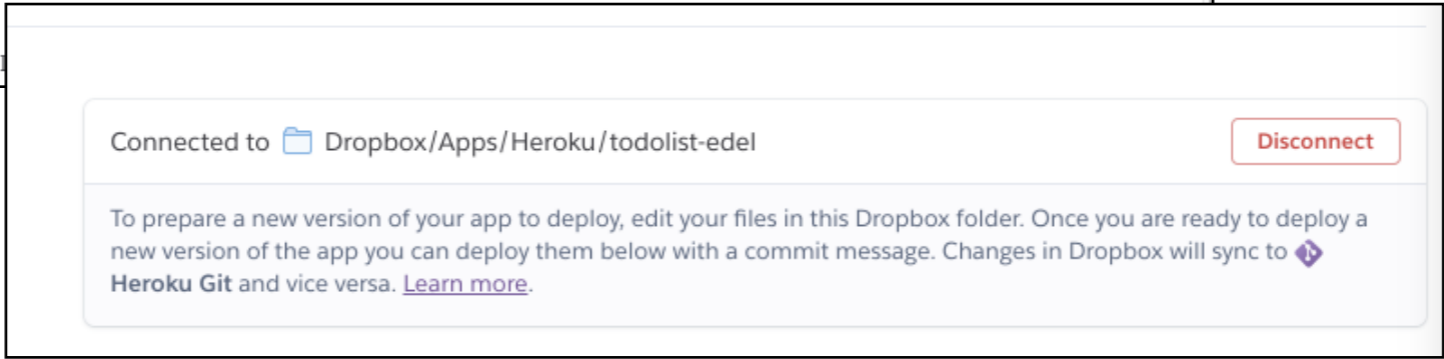
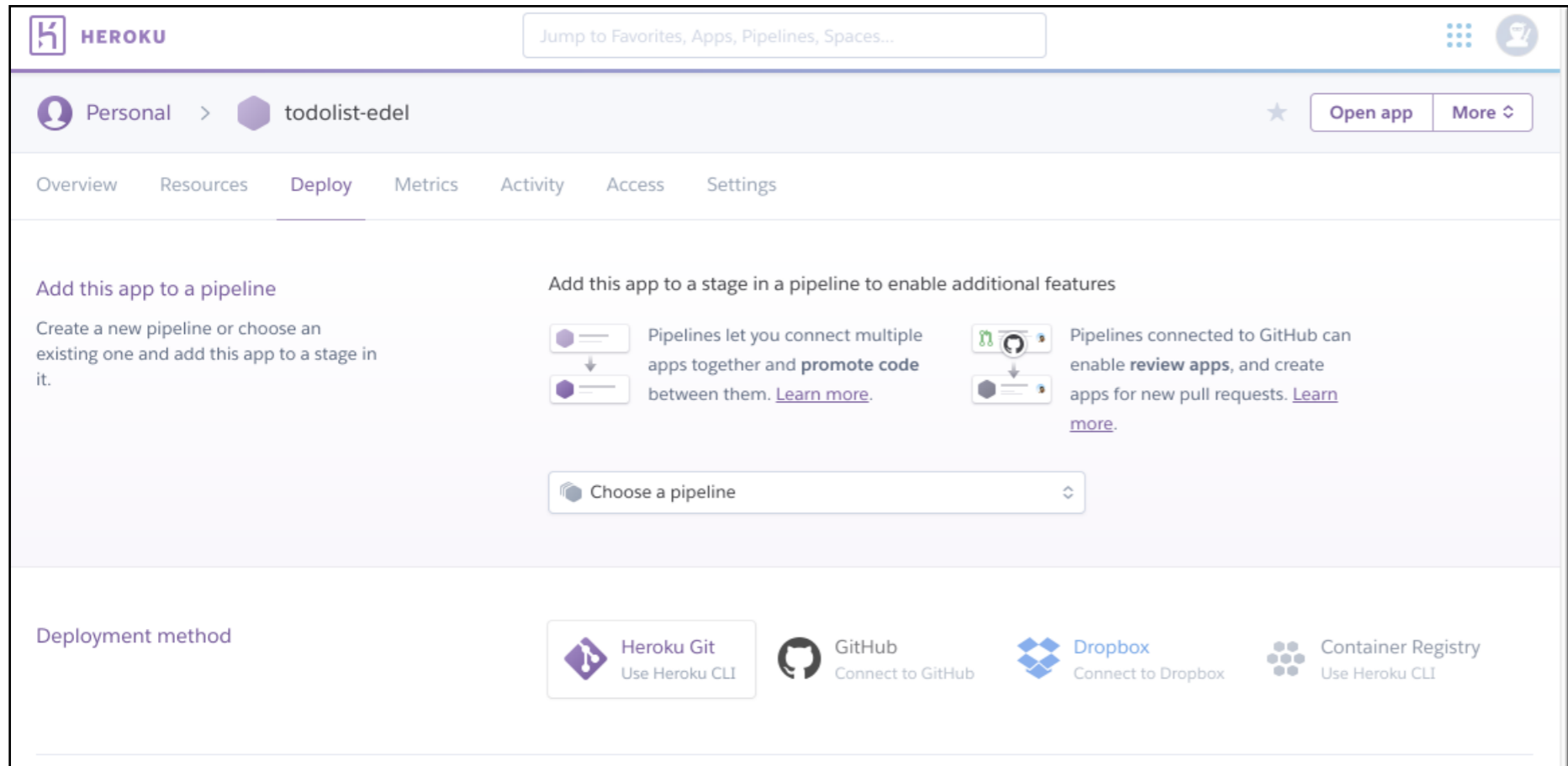
2.Staging



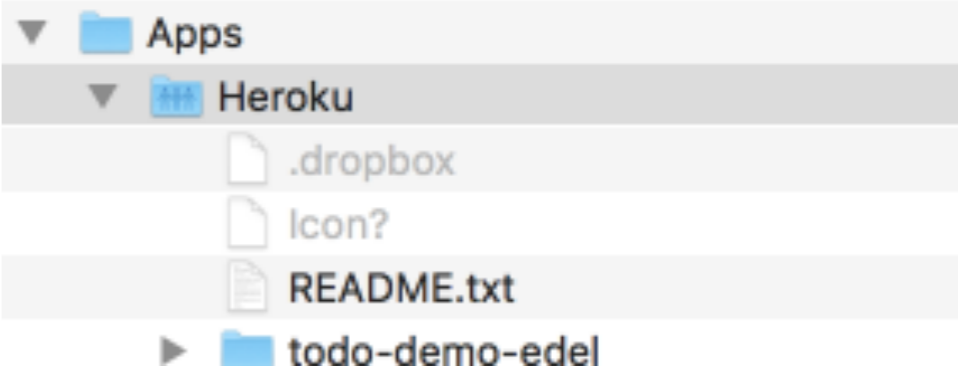
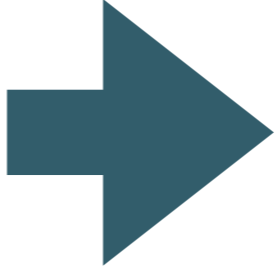
The image shows the 'Create New App' form in Heroku. The form has a title 'Create New App' at the top. Below the title, there are two main sections. The first section is 'App name', which has a text input field containing 'todolist-edel' and a green checkmark icon on the right. Below the input field, there is a green message that says 'todolist-edel is available'. The second section is 'Choose a region', which has a dropdown menu with 'Europe' selected and a dropdown arrow on the right. Below the dropdown menu, there is a link that says 'Add to pipeline...'. At the bottom of the form, there is a purple button that says 'Create app'.

2.2- Connect to Dropbox

2. Staging

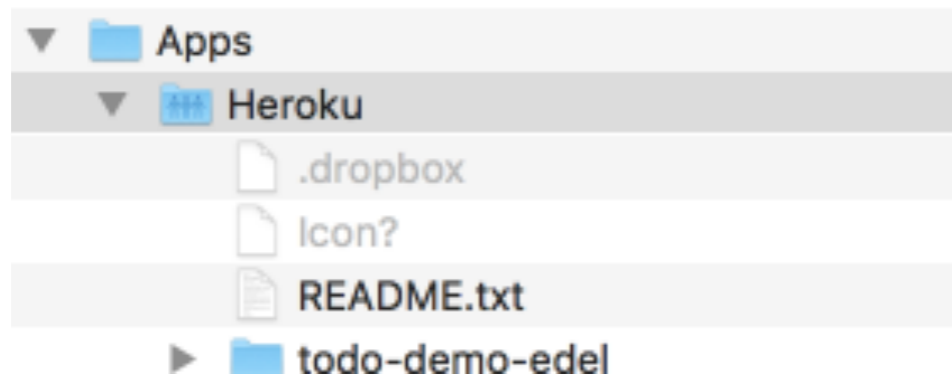


Create an empty folder on dropbox for the project



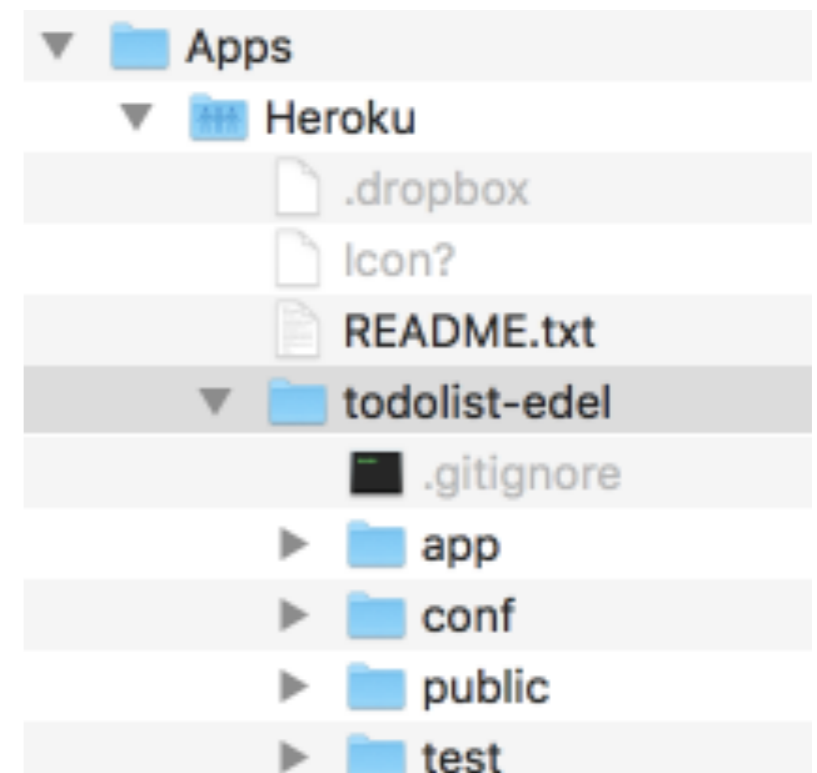
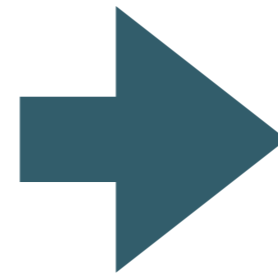
2.3- Copy project to dropbox

2. Staging



Simple copy/paste of project folders

- app
- conf
- public
- test



2.4- Configure Build Pack

2. Staging

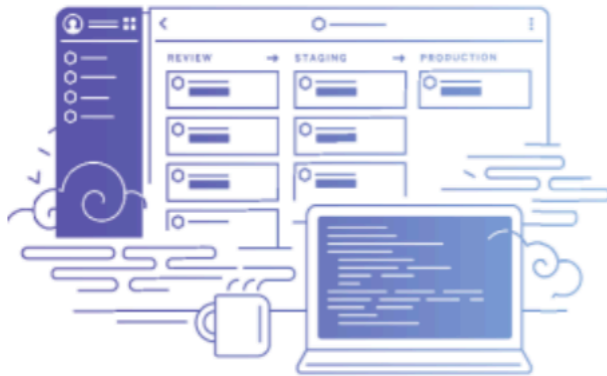
The screenshot shows the Heroku dashboard for an application named 'todolist-edel'. The top navigation bar includes 'Personal', 'todolist-edel', 'Open app', and 'More'. Below this is a menu with 'Overview', 'Resources', 'Deploy', 'Metrics', 'Activity', 'Access', and 'Settings'. The main content area is divided into sections: 'Name' (todolist-edel), 'Config Variables' (with a 'Reveal Config Vars' button), 'Info' (listing Region, Stack, Framework, Slug size, and Heroku Git URL), and 'Buildpacks' (with a description and a link to 'Find new buildpacks on Heroku Elements').

The 'Add Buildpack' modal dialog is open, showing a text input field with the URL 'https://github.com/heroku/heroku-buildpack-play'. Below the input field, there is a section titled 'Or select from our officially supported buildpacks' with a grid of icons for 'nodejs', 'python', 'php', 'ruby', 'java', 'go', 'gradle', 'scala', and 'clojure'. A large purple 'Save changes' button is at the bottom.

Instructs Heroku that the application is a Play Framework app.

Deploying a Play Application

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Deploy a Play Application to the
cloud

3.Deployment

Two Processes:

3.1- Build & Deploy

3.2- Monitor

3.1- Build

3. Deployment

Deploy your latest changes

Add a commit message to tell others what you've changed.

Pushed from Dropbox

Deploy

Receive code from Dropbox

Build app [Hide build log](#)

```
-----> Discovering process types
  Procfile declares types      -> (none)
  Default types for buildpack -> web
-----> Compressing...
  Done: 89.8M
-----> Launching...
  Released v5
  https://todolist-edel.herokuapp.com/ deployed to Heroku
```

Build finished

Deploy to Heroku

Your app was successfully deployed.

Manage App

View

Dashboard

Todo List

homer simpson's Todo List

Todo	
Make tea	Delete
Go for snooze	Delete

Title

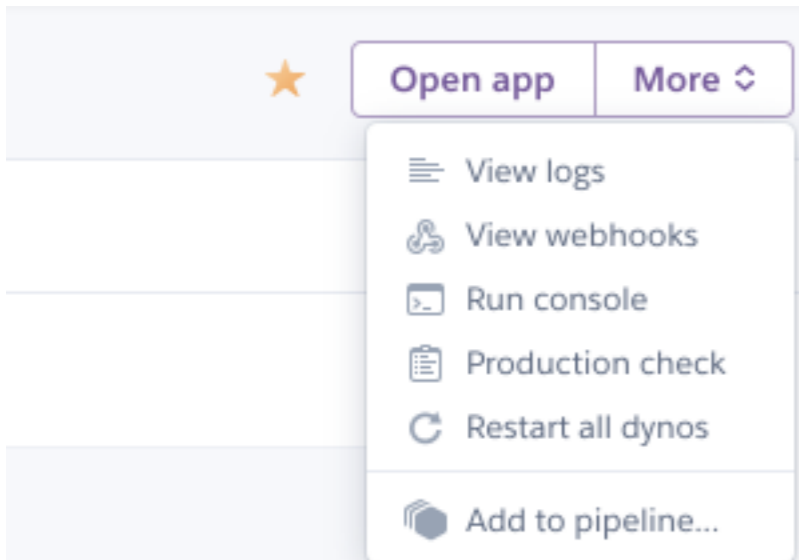
Title

Add Todo

Deploy button copies the dropbox folder, builds & launches the app

3.2- Monitor - Application Console

3. Deployment



Application Logs

ALL PROCESSES

```
2018-04-28T06:46:57.262005+00:00 heroku[web.1]: Starting process with command `play run --http.port=8575 --%prod -Dprecompiled=true`
2018-04-28T06:46:59.289767+00:00 app[web.1]: Create a Procfile to customize the command used to run this process: https://devcenter.heroku.com/articles/procfile
2018-04-28T06:46:59.580802+00:00 app[web.1]: Picked up JAVA_TOOL_OPTIONS: -Dfile.encoding=UTF-8
2018-04-28T06:47:00.525471+00:00 app[web.1]: 06:47:00,524 INFO ~ Starting /app
2018-04-28T06:47:00.960385+00:00 app[web.1]: :: loading settings :: url = jar:file:/app/.play/framework/lib/ivy-2.4.0.jar!/org/apache/ivy/core/settings/ivysettings.xml
2018-04-28T06:47:01.491954+00:00 app[web.1]: 06:47:01,491 INFO ~ Application is precompiled
2018-04-28T06:47:04.238824+00:00 app[web.1]: 06:47:04,237 INFO ~ HikariPool-1 - Starting...
2018-04-28T06:47:04.457666+00:00 app[web.1]: 06:47:04,457 INFO ~ HikariPool-1 - Start completed.
2018-04-28T06:47:04.477044+00:00 app[web.1]: 06:47:04,476 INFO ~ Connected to jdbc:postgresql://ec2-79-125-14-195.eu-west-1.compute.amazonaws.com:5432/dcbjsg53rodgeo for default
2018-04-28T06:47:07.963782+00:00 app[web.1]: 06:47:07,963 INFO ~ Application 'todolist' is now started !
2018-04-28T06:47:08.830163+00:00 app[web.1]: 06:47:08,825 WARN ~ Precompiled template /conf/data.yml not found, trying to load it dynamically...
2018-04-28T06:47:08.830174+00:00 app[web.1]: java.lang.RuntimeException: Cannot load precompiled template /conf/data.yml
2018-04-28T06:47:08.830176+00:00 app[web.1]:     at play.templates.BaseTemplate.loadPrecompiled(BaseTemplate.java:44)
2018-04-28T06:47:08.830177+00:00 app[web.1]:     at play.templates.TemplateLoader.load(TemplateLoader.java:75)
2018-04-28T06:47:08.830178+00:00 app[web.1]:     at play.test.Fixtures.loadModels(Fixtures.java:223)
2018-04-28T06:47:08.830180+00:00 app[web.1]:     at play.test.Fixtures.loadModels(Fixtures.java:191)
2018-04-28T06:47:08.830181+00:00 app[web.1]:     at Bootstrap.doJob(Bootstrap.java:16)
2018-04-28T06:47:08.830183+00:00 app[web.1]:     at play.jobs.Job.doJobWithResult(Job.java:64)
2018-04-28T06:47:08.830184+00:00 app[web.1]:     at play.jobs.Job$.apply(Job.java:224)
2018-04-28T06:47:08.830185+00:00 app[web.1]:     at play.db.jpa.JPA.withTransaction(JPA.java:285)
2018-04-28T06:47:08.830187+00:00 app[web.1]:     at play.db.jpa.JPA.withinFilter(JPA.java:238)
2018-04-28T06:47:08.830188+00:00 app[web.1]:     at play.db.jpa.JPAPugin$.TransactionalFilter.withinFilter(JPAPugin.java:304)
2018-04-28T06:47:08.830189+00:00 app[web.1]:     at play.jobs.Job.withinFilter(Job.java:201)
2018-04-28T06:47:08.830190+00:00 app[web.1]:     at play.jobs.Job.call(Job.java:220)
2018-04-28T06:47:08.830192+00:00 app[web.1]:     at Invocation.Job(Play!)
2018-04-28T06:47:08.830193+00:00 app[web.1]: Caused by: play.exceptions.UnexpectedException: Unexpected Error
2018-04-28T06:47:08.830194+00:00 app[web.1]:     at play.libs.IO.readContent(IO.java:133)
2018-04-28T06:47:08.830196+00:00 app[web.1]:     at play.templates.BaseTemplate.loadPrecompiled(BaseTemplate.java:41)
2018-04-28T06:47:08.830197+00:00 app[web.1]:     ... 12 more
2018-04-28T06:47:08.830199+00:00 app[web.1]: Caused by: java.io.FileNotFoundException: File '/app/precompiled/templates/conf/data.yml' does not exist
2018-04-28T06:47:08.830200+00:00 app[web.1]:     at org.apache.commons.io.FileUtils.openInputStream(FileUtils.java:292)
2018-04-28T06:47:08.830201+00:00 app[web.1]:     at org.apache.commons.io.FileUtils.readFileToByteArray(FileUtils.java:1815)
2018-04-28T06:47:08.830202+00:00 app[web.1]:     at play.libs.IO.readContent(IO.java:131)
2018-04-28T06:47:08.830203+00:00 app[web.1]:     ... 13 more
2018-04-28T06:47:09.342593+00:00 app[web.1]: 06:47:09,342 INFO ~ Listening for HTTP on port 8575 ...
2018-04-28T06:47:09.666880+00:00 heroku[web.1]: State changed from starting to up
2018-04-28T06:47:15.508850+00:00 app[web.1]: 06:47:15,508 INFO ~ Rendering Start
2018-04-28T06:47:15.647864+00:00 heroku[router]: at=info method=GET path="/" host=todolist-edel.herokuapp.com request_id=8b963b67-6c63-43b0-b800-7571681a1328 fwd="86.44.43.185" dyno=web.1 connect=1ms service=225ms status=200 bytes=1454 protocol=https
2018-04-28T06:47:17.790158+00:00 heroku[router]: at=info method=GET path="/login" host=todolist-edel.herokuapp.com request_id=0c63d948-66b5-4d51-9c57-4fd95d8a85e1 fwd="86.44.43.185" dyno=web.1 connect=1ms service=27ms status=200 bytes=1878 protocol=https
2018-04-28T06:47:17.855407+00:00 heroku[router]: at=info method=GET path="/public/images/todo-2.jpg" host=todolist-edel.herokuapp.com request_id=31eb8230-2d5e-491a-b376-8f668de20be6 fwd="86.44.43.185" dyno=web.1 connect=1ms service=39ms status=200 bytes=173344 protocol=https
2018-04-28T06:47:25.509132+00:00 app[web.1]: 06:47:25,509 INFO ~ Attempting to authenticate with homer@simpson.com:secret
2018-04-28T06:47:25.523568+00:00 app[web.1]: 06:47:25,523 INFO ~ Authentication successful
2018-04-28T06:47:25.576685+00:00 app[web.1]: 06:47:25,576 INFO ~ Rendering Dashboard
2018-04-28T06:47:25.834299+00:00 heroku[router]: at=info method=GET path="/dashboard" host=todolist-edel.herokuapp.com request_id=daa255f3-3b12-4426-a72a-fba887e5b192 fwd="86.44.43.185" dyno=web.1 connect=2ms service=271ms status=200 bytes=2217 protocol=http
2018-04-28T06:47:25.531339+00:00 heroku[router]: at=info method=POST path="/authenticate" host=todolist-edel.herokuapp.com request_id=5befb30f-1445-4cb3-967e-4d17745e0885 fwd="86.44.43.185" dyno=web.1 connect=0ms service=46ms status=302 bytes=499 protocol=https
```

Autoscroll with output

Save

Replicates the Console visible when the app is running on localhost

3.2- Monitor - Build

3. Deployment

Deploy your latest changes

Add a commit message to tell others what you've changed.

Pushed from Dropbox Deploy

Receive code from Dropbox ✓

Build app [Hide build log](#) ⋮

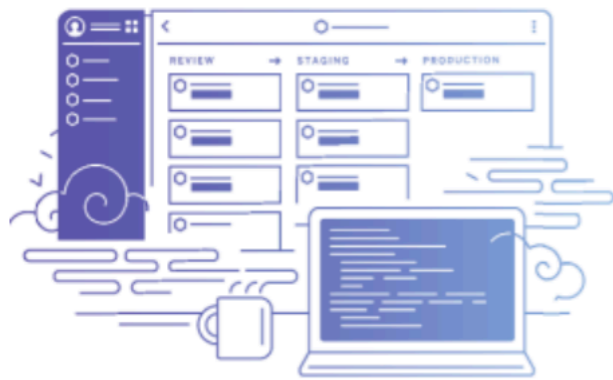
```
~
~      lib/postgresql-42.2.2.jar
~      lib/org.osgi.enterprise-4.2.0.jar
~      lib/org.osgi.core-4.3.1.jar
~
~ Done!
~
Precompiling: .play/play precompile ./ --silent 2>&1
```

Autoscroll with output

If app malfunctioning, check Build Logs to see if application was compiled correctly.

Deploying a Play Application

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cloud

1. Configuration

- 1.1- JDK Version
- 1.2- Play Version
- 1.3- Database Connection Str

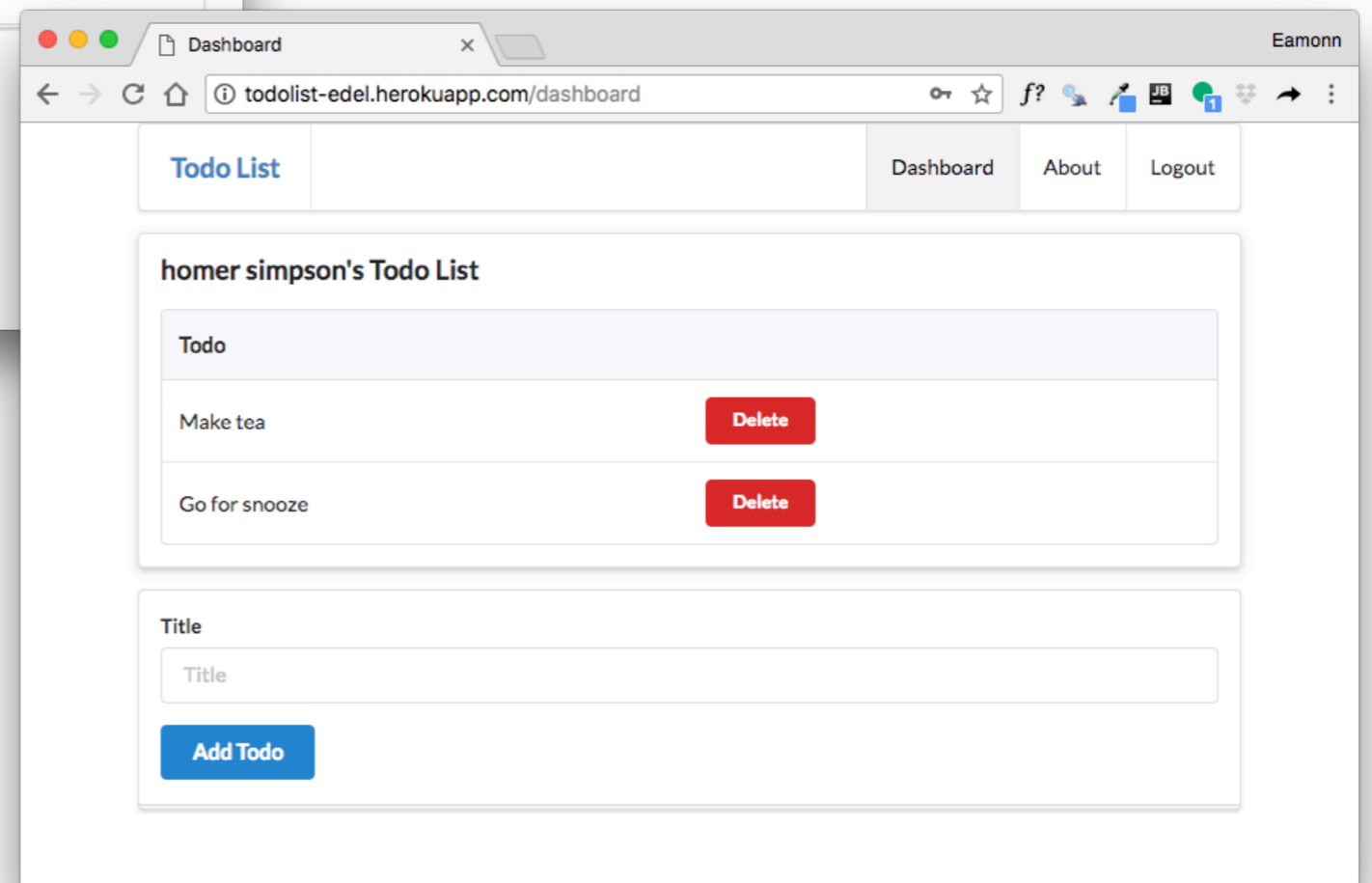
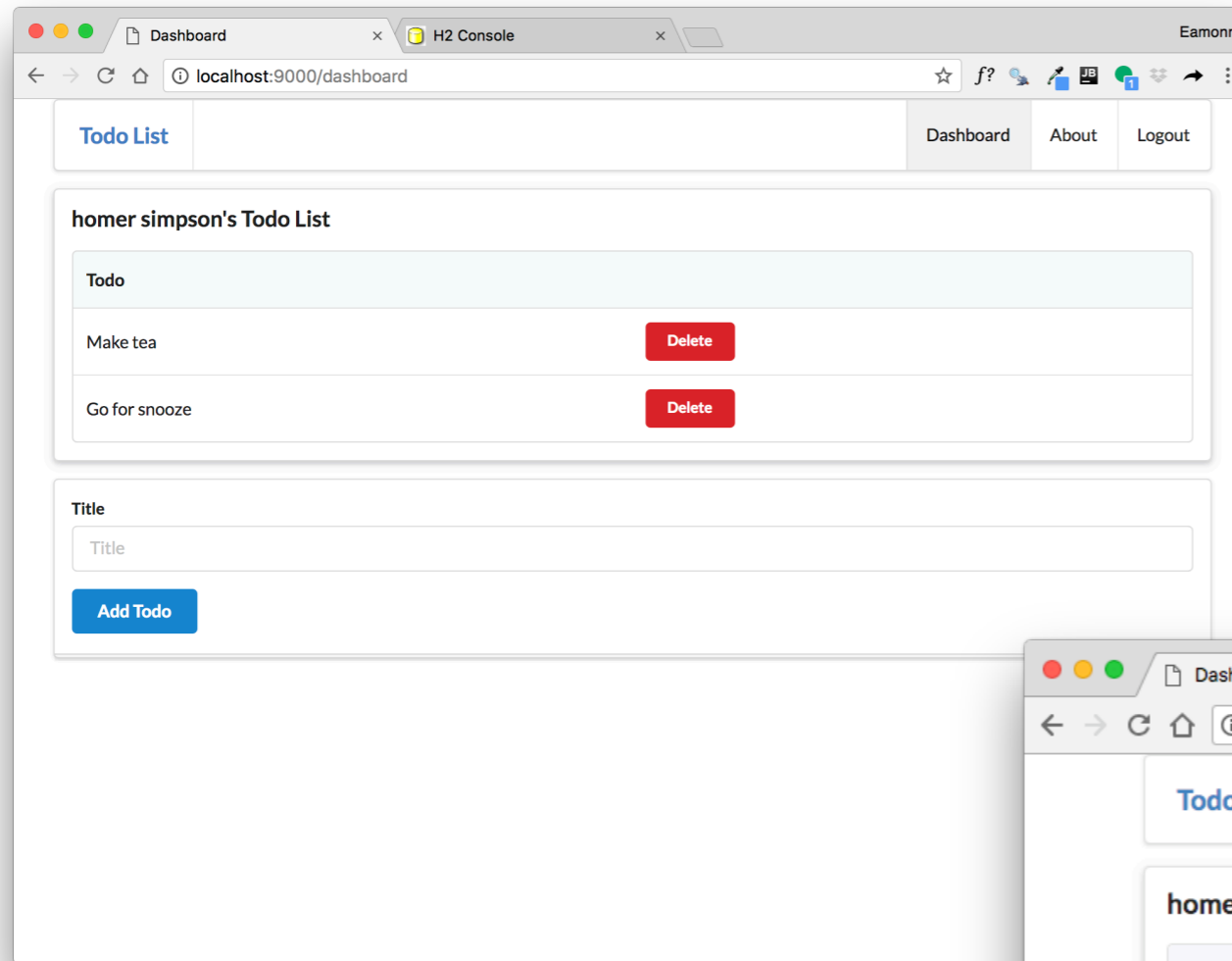
2. Staging

- 2.1- Create the Application
- 2.2- Connect to Dropbox
- 2.3- Copy project to dropbox
- 2.4- Configure Play Build pack

3. Deployment

- 3.1- Build & Deploy
- 3.2- Monitor

http://localhost:9000



http://todolist-edel.herokuapp.com/dashboard

<http://localhost:9000/@db>

The screenshot shows the H2 Console interface. The top part displays the database schema with a tree view on the left containing: jdbc:h2:mem:play, member, member_todo, todo, information_schema, Sequences, Users, and H2 1.4.196 (2017-06-10). The main area has a 'SQL statement:' input field and buttons for 'Run', 'Run Selected', 'Auto complete', and 'Clear'. Below this is an 'Important Commands' section with icons and descriptions for actions like 'Displays this', 'Shows the', 'Executes the', and 'Disconnects'. A 'Sample SQL Script' section lists various database operations like 'Delete the table if it exists', 'Create a new table', 'Add a new row', etc. At the bottom, there is an 'Adding Database Drivers' section.

The screenshot shows the 'todolist-edel' dashboard. The top navigation bar includes the site name 'todolist-edel', a search box 'Jump to table (s to focus)', and the user 'Signed in as edeleastar@gmail.com'. The main content area is titled 'Dashboard' and features two table listings:

- Listing on todo** (4 records):

	Id	Title
	6	demo
	3	Make more tea
	2	Go for snooze
	1	Make tea
- Listing on member** (2 records):

	Id	Email	Firstname	Lastname	Password
	5	marge@simpson.com	marge	simpson	secret
	4	homer@simpson.com	homer	simpson	secret

At the bottom, there is a summary table of database tables:

Table	Full table size	Table size	Record count	
member	32 KB	8 KB	2	
member_todo	24 KB	8 KB	3	
todo	24 KB	8 KB	3	
Totals	6 tables	80 KB	24 KB	0

Additional elements include an 'Add a new table' button, 'Database size 7.86 MB', and a footer with links to system tables: [pg_stat_activity](#), [pg_stat_statements](#), [pg_stat_all_indexes](#), [pg_stat_user_tables](#), and [Database settings](#).

<https://www.adminium.io/dashboard>

Monitoring the Deployed app...

The screenshot shows the Heroku dashboard for the application 'todolist-edel'. The 'Dropbox' tab is active, showing instructions on how to prepare a new version of the app for deployment. A 'Deploy changes' section is visible, with a 'Deploy' button. Below this, the 'Build app' section shows the output of the build process, including the command 'play run --http.port=\$PORT \$PLAY_OPTS' and the final message 'Build finished'.

The screenshot shows the Heroku dashboard for the application 'todolist-edel', specifically the 'Application Logs' section. The logs show the application's startup sequence, including authentication attempts and successful logins. The logs are filtered to show 'ALL PROCESSES'. The 'Autoscroll with output' checkbox is checked.

The screenshot shows the deployed application's dashboard at 'todolist-edel.herokuapp.com'. The page title is 'homer simpson's Todo List'. It features a list of todos: 'Make tea', 'Go for snooze', and 'Go for snooze'. Each todo has a 'Delete' button. Below the list is a form to add a new todo, with a text input for the title and an 'Add Todo' button. The browser's developer tools are open, showing the Network tab with a list of requests and their details.

The screenshot shows the Adminium dashboard for the application 'todolist-edel'. The page title is 'Dashboard'. It features a table listing the database tables and their sizes. The table has columns for 'Table', 'Full table size', 'Table size', and 'Record count'. The data is as follows:

Table	Full table size	Table size	Record count	
member	32 KB	8 KB	2	
member_todo	24 KB	8 KB	3	
todo	24 KB	8 KB	3	
Totals	6 tables	80 KB	24 KB	0

At the bottom right, it says 'Database size 7.86 MB'. There is also a table listing the members of the application:

Id	Email	Firstname	Lastname	Passw
5	marge@simpson.com	marge	simpson	secret
4	homer@simpson.com	homer	simpson	secret