dukescript

Put Java into JavaScript

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PROBLEM I


JAVASCRIPT
ALL THE THINGS
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ALL THE THINGS
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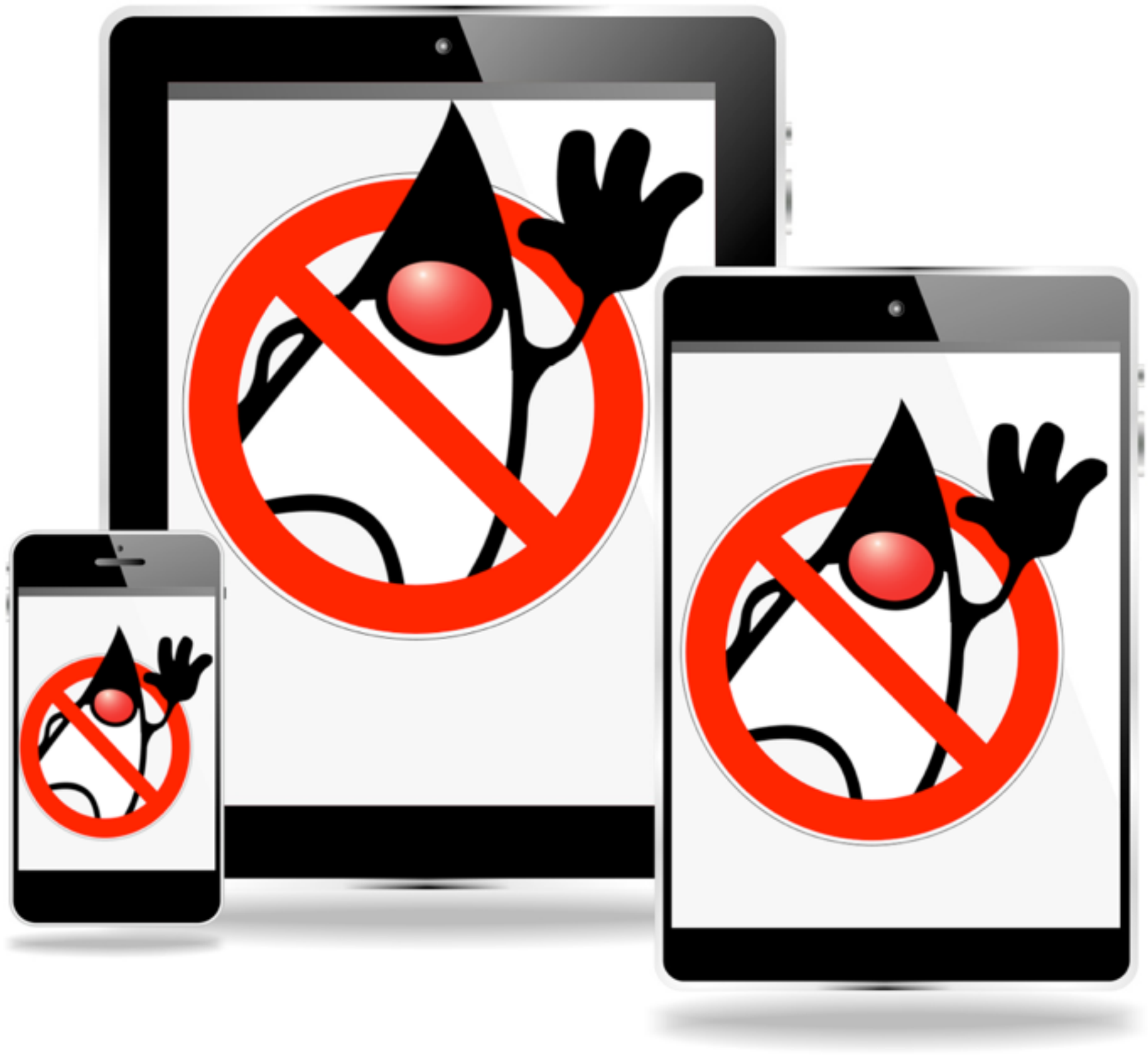
ALL THE THINGS

"JavaScript is just a bunch of letters in a bag"

Zoran Sevarac, Java Champion

PROBLEM II



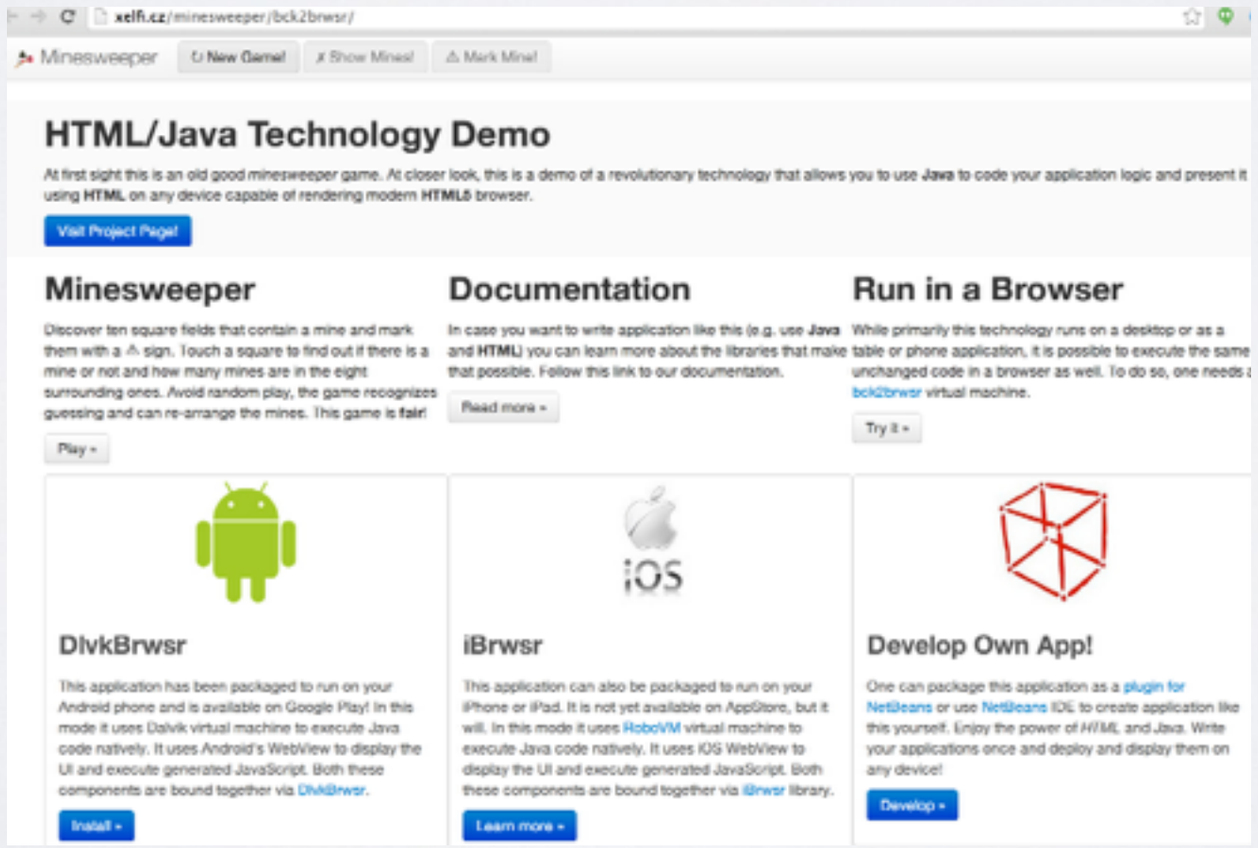
dukescript

Write Java, render in HTML5

"DukeScript is the Lightweight JavaFX I always dreamed of!"

Stephen Chin, JavaOne M.C.

demo


xelfi.cz/minesweeper/bck2brwsr/
Minesweeper
New Game!
Show Mines!
Mark Mine!
HTML/Java Technology Demo
At first sight this is an old good minesweeper game. At closer look, this is a demo of a revolutionary technology that allows you to use Java to code your application logic and present it using HTML on any device capable of rendering modern HTML5 browser.
Visit Project Page!
Minesweeper
Discover ten square fields that contain a mine and mark them with a ⚠ sign. Touch a square to find out if there is a mine or not and how many mines are in the eight surrounding ones. Avoid random play, the game recognizes guessing and can re-arrange the mines. This game is fair!
Play »
Documentation
In case you want to write application like this (e.g. use Java and HTML) you can learn more about the libraries that make that possible. Follow this link to our documentation.
Read more »
Run in a Browser
While primarily this technology runs on a desktop or as a table or phone application, it is possible to execute the same unchanged code in a browser as well. To do so, one needs a bck2brwsr virtual machine.
Try it »
DlvkBrwsr
This application has been packaged to run on your Android phone and is available on Google Play! In this mode it uses Dalvik virtual machine to execute Java code natively. It uses Android's WebView to display the UI and execute generated JavaScript. Both these components are bound together via DlvkBrwsr.
Install »
iOS
iBrwsr
This application can also be packaged to run on your iPhone or iPad. It is not yet available on AppStore, but it will. In this mode it uses RoboVM virtual machine to execute Java code natively. It uses iOS WebView to display the UI and execute generated JavaScript. Both these components are bound together via iBrwsr library.
Learn more »
Develop Own App!
One can package this application as a plugin for NetBeans or use NetBeans IDE to create application like this yourself. Enjoy the power of HTML and Java. Write your applications once and deploy and display them on any device!
Develop »

HOW DOES IT WORK?

HOW DOES IT WORK?

Insert HTML5 Renderer here

DukeScript glues them together

Insert JVM here

HOW DOES IT WORK?

HTML5 Component renders the result

DukeScript and it's Java APIs control the Renderer

JVM executes Java Business Logic, written with DukeScript Java APIs

DESKTOP

javafx.scene.web.WebView

DukeScript glues them together

Hotspot

ANDROID

android.webkit.WebView

DukeScript glues them together

Dalvik

IOS

NSObject.UIResponder.UiView
.UIWebView

DukeScript glues them together

RoboVM

BROWSER

Chrome…

DukeScript glues them together

bck2brwsr

SO IT'S LIKE JSF?

NO!

EVERYTHING RUNS ON THE CLIENT!

dukescript

Getting started!

Basic Archtype:

```
mvn archetype:generate
    -DarchetypeGroupId=com.dukescript.archetype
    -DarchetypeArtifactId=knockout4j-archetype
    -DarchetypeVersion=0.7
```

CRUD Example (Client Server Interaction):

```
mvn archetype:generate
    -DarchetypeGroupId=com.dukescript.archetype
    -DarchetypeArtifactId=crud4j-archetype
    -DarchetypeVersion=0.7
```

Additional Properties:

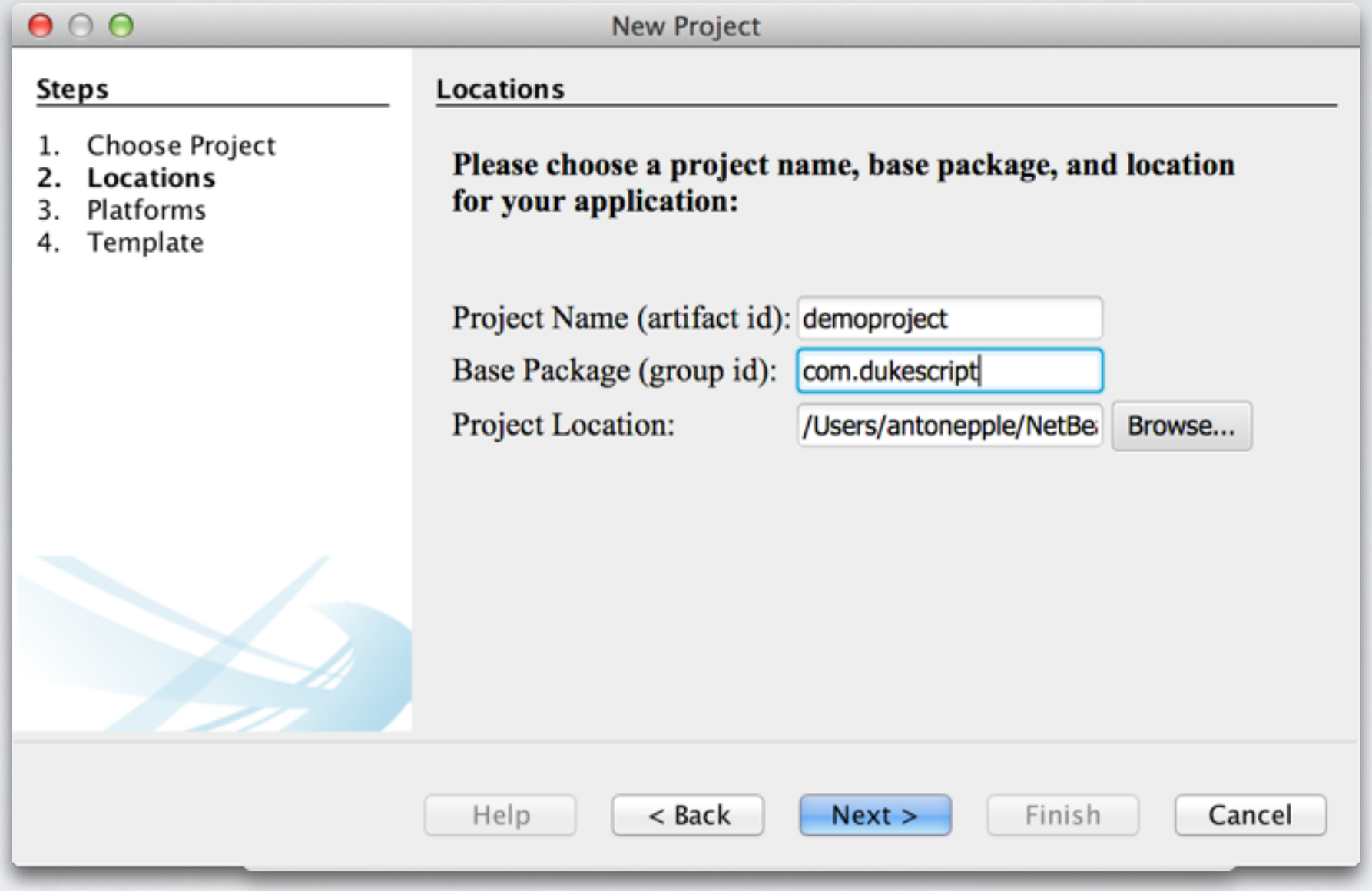
Run in Browser:
 -Dwebpath=client-web

Create NetBeans Module:
 -Dnetbeanspath=client-netbeans

Create iOS project:
 -Diospath=client-ios

Create Android project:
-Dandroidpath=client-android

In NetBeans


New Project
Steps
1. Choose Project
2. Locations
3. Platforms
4. Template
Locations
Please choose a project name, base package, and location for your application:
Project Name (artifact id): demoproject
Base Package (group id): com.dukescript
Project Location: /Users/antonepple/NetBe
Browse...
Help
< Back
Next >
Finish
Cancel

demo

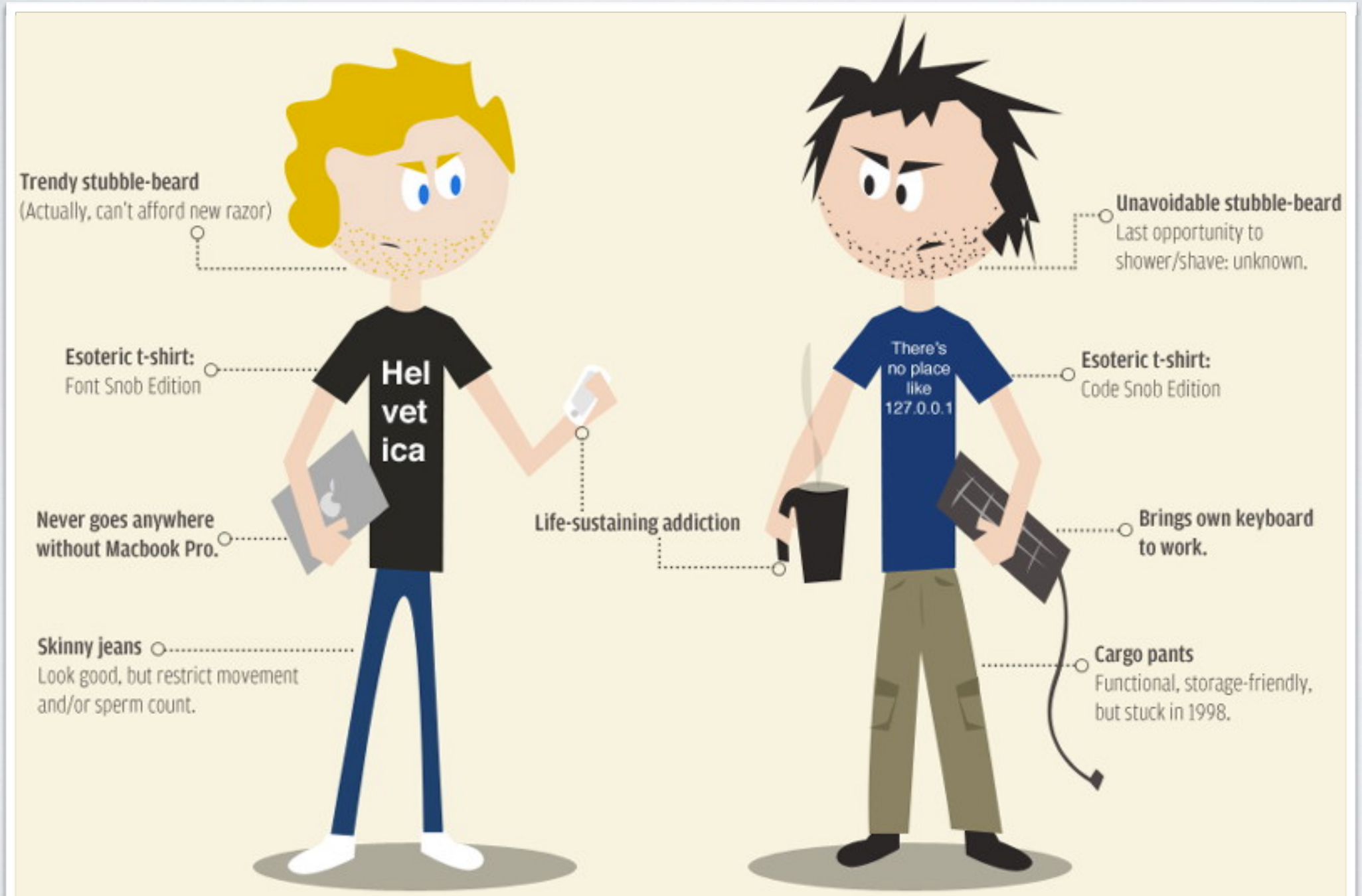
dukescript

Our APIs

Knockout.

#KNOCKOUT

DESIGNER VS DEVELOPER



DESIGNER VS DEVELOPER

index.html

```
<html>
<button id="hello">
Say Hello!</button
data-bind="enable: !
rotating(), click:
$root.turnAnimationOn">
</html>
```

App.java

```
@Model(className = „Data“,
properties ={ @Property(name =
"rotating", type = boolean.class)

})

static class PersonModel{

@Function static void
turnAnimationOn(Data model) {

    model.setRotating(true);

  }

}
```

Knockout.

```
@Model(className="Person", properties={

  @Property(name = "firstName", type=String.class),

  @Property(name = "lastName", type=String.class)

  @Property(name = "addresses", type=Address.class, array = true)

})

static class PersonModel {
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

```
@Model(className="Address", properties={

    @Property(name = "street", type=String.class),
    @Property(name = "town", type=String.class)

})

static class AddressModel {

}
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

Generated class is used like this:

```
Person p = new Person("Jára", "Cimrman",
        new Address("Ferdinandov", "Hejnice"),
        new Address("124", "Liptákov")
);
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

toString generates JSON-String:

```
{  "firstName" : "Adam",
   "lastName" : "Bernau",
   "addresses" : [
     { "street" : "Jezerní", "town" : "Kamenice" }
   ]
}}
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

Bind to HTML Page:

```
Models.applyBindings(p, "person");
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

```
<div id=„person“>

 <span data-bind="text: fullName">

  <div data-bind="foreach: addresses">

  Lives in <span data-bind="text: town"/>

</div>
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

DEBUGGING DEMOS

Knockout.

Parsing JSON:

As simple as defining a Model

https://api.github.com/users/eppleton/repos

https://dukescript.com/update/2015/01/27/ParsingJSON.html

Knockout.

```
@Model(className = "Repos", properties = {

    @Property(name = "repos", type = Repo.class, array = true),

    @Property(name = "url", type = String.class)
})
final class DataModel {@Model(className = "Repo", properties = {

        @Property(name = "name", type = String.class),

        @Property(name="html_url", type = String.class)

    })

    public static class RepoModel {}

}
```

Knockout.

Creating an Endpoint:

@OnReceive(url = "{url}")

```
static void loadRepos(Repos ui, List<Repo> arr) {

    ui.getRepos().clear();

    ui.getRepos().addAll(arr);

}
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

Creating an Endpoint:

@ModelOperation

@Function

```
static void connect(Repos data) {

    data.loadRepos(data.getUrl());

}
```

http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html

Knockout.

Putting it all together:

```
public static void onPageLoad() throws Exception {

    Repos d = new Repos();

    final String baseUrl = "https://api.github.com/users/eppleton/repos";

    d.setUrl(baseUrl);

    d.applyBindings();

    d.connect();

}
```

Knockout.

CLIENT SERVER DEMO

Leaflet.js

An Open-Source JavaScript Library for Mobile-Friendly Interactive Maps

Leaflet.js

https://github.com/eppleton/leaflet4j

```
final Leaflet map = Leaflet.map("map");

 map.setView(new LatLng(51.505, -0.09), 13);

 map.addTileLayer(
    "https://{s}.tiles.mapbox.com/v3/{id}/{z}/{x}/{y}.png",
    "Map data &copy; <a href='http://openstreetmap.org'>OpenStreetMap</a> contributors, " +
    "<a href='http://creativecommons.org/licenses/by-sa/2.0/'>CC-BY-SA</a>, " +
    "Imagery © <a href='http://mapbox.com'>Mapbox</a>",
    18,  ,,your-id"
);
```

Leaflet

```
final Leaflet map = Leaflet.map(,,map");

map.addCircle(

        new LatLng(51.508, -0.11), 500, "red", "#f03", 0.5

).bindPopup("I am a circle");

map.addPolygon(

            new LatLng(51.509, -0.08),

            new LatLng(51.503, -0.06),

            new LatLng(51.51, -0.047)

        ).bindPopup("I am a polygon");
```

```
map.on(MouseEvent.Type.CLICK,
        new MouseListener() {
            @Override
            public void onEvent(MouseEvent ev) {
                map.openPopup(ev.getLatLng(), "You clicked the map at " +
                                ev.getLatLng());
            }
});
```

DEMO

LEAFLET.JS FOR JAVAFX

```
final MapView map = new MapView();

BorderPane borderPane = new BorderPane();

borderPane.setCenter(map);
```

```
 // a regular JavaFX ListView

ListView<Address> listView = new ListView<Address>();

listView.getItems().addAll(

                new Address("Toni", new LatLng(48.1322840, 11.5361690)),

            new Address(,,Adam Bernau", new LatLng(50.0284060, 14.4934400)),

            new Address("JFokus", new LatLng(51.94906770000001, 7.613701100000071)));

);
```

```
listView.getSelectionModel().selectedItemProperty().addListener(

        (ObservableValue<? extends Address> ov, Address old_val, final Address new_val) -> {

                FXBrowsers.runInBrowser(map.getWebView(), new Runnable() {

                        @Override

                                public void run() {

                                map.getLeaflet().setView(new_val.getPos(), 20);

                                map.getLeaflet().openPopup(new_val.getPos(),"Here is "+new_val);

                        }

        });

});
```

DEMO

CANVAS 0.7

https://github.com/dukescript/dukescript-canvas

CANVAS API

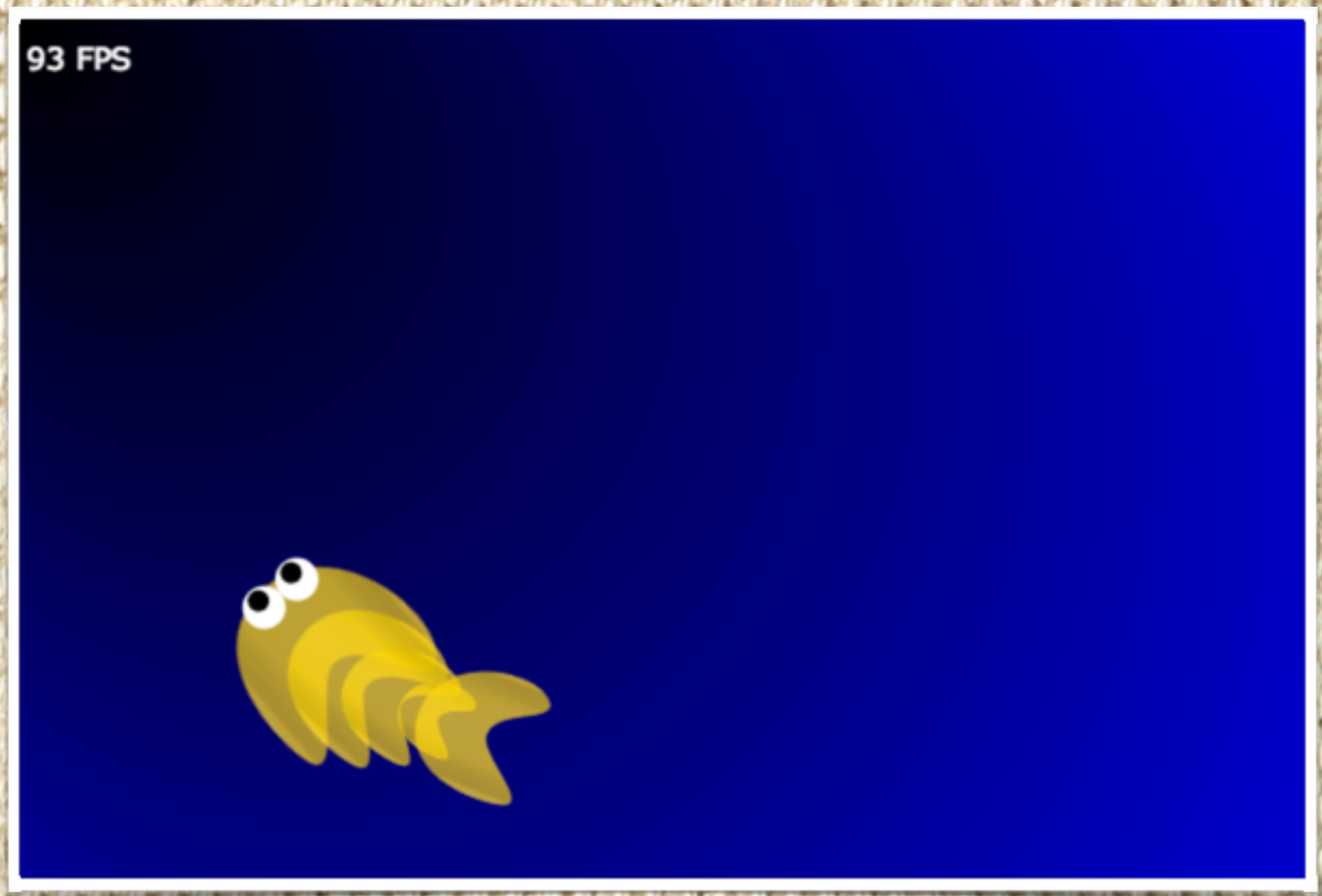
≈

HTML5 CANVAS

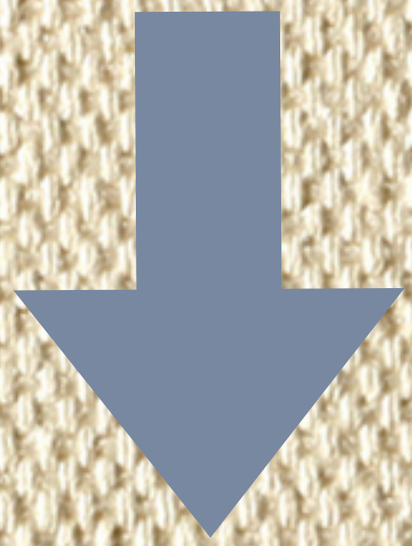
CANVAS API

```
GraphicsContext2D gc = HTML5Graphics.getOrCreate("canvas");
gc.setLineWidth(30);
gc.setFont("24px Helvetica");
gc.fillText("Hello World!", 175, 200);
gc.setFillStyle(new Color("rgba(0, 0, 255, 0.5)“));
gc.strokeRect(75, 100, 200, 200);
gc.fillRect(325, 100, 200, 200);
```

DEMO

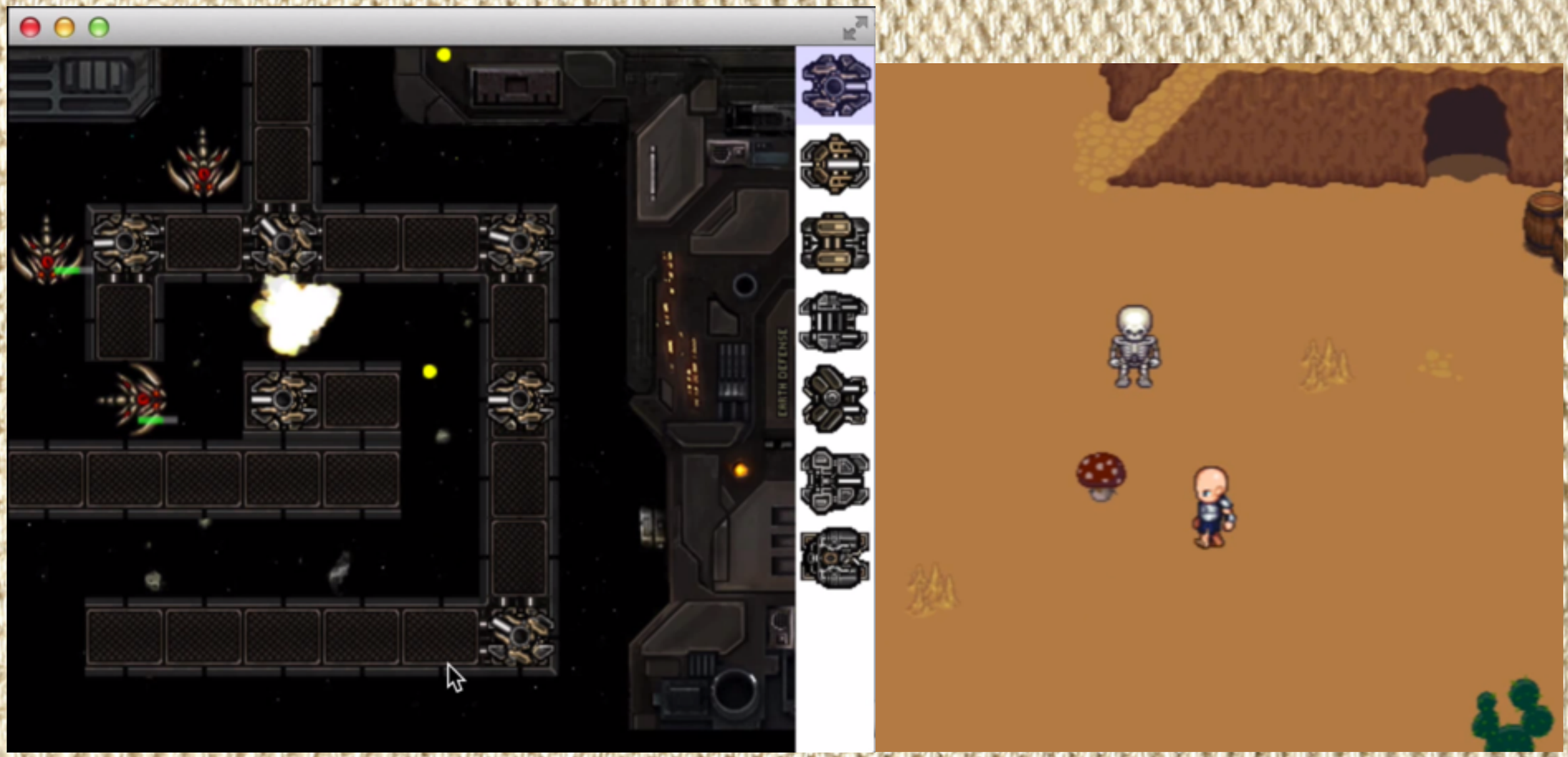

93 FPS

JAVAFX WITH CANVAS API IN BCK2BRWSR



http://xelfi.cz/fishsim/

FXGAMES



Available soon on Github!

controls.js

http://controlsjs.com/

DEMO

dukescript

Who is developing it?

Contributors:

- Base technology developed by Oracle (NetBeans subproject), free and Open Source
- Eppleton IT Consulting: iOS and Android support, commercial support
- Additional APIs and support for iOS and Android developed by the DukeScript Community
- First Commercial API: Controls4J (http://controlsjs.com/#CONTROLS4J)

dukescript

Why **YOU** should use it!

Use MVVM in Java:

Knockout enables **true** MVVM (no Presenter, no Toolkit dependency in Model code)

Use MVVM in Java:

True Designer - Developer - Workflow

=> Web Designer's work used directly, no conversion, etc.

Write Cross-Platform Apps:

- iOS
- Android
- Desktop
- any modern Browser (via bck2brwsr)

Write Enterprise Apps:

Get rid of unmaintainable JavaScript Code

Write Enterprise Apps:

Use existing Java Knowledge

Write Enterprise Apps:

All business code in one language (Client & Server)

Write Enterprise Apps:

Code reuse, no synchronization of Model code

Write Enterprise Apps:

Typesafe, more errors caught at compile time
=> less Unit tests

Write Enterprise Apps:

Java => better tooling

Write Enterprise Apps:

=>

Faster development, less code, lower cost of ownership

Enhance your JavaFX App:

- Leverage JavaScript Frameworks
- Either use existing ones (like Leaflet.js)…
- or write your own Java Wrapper (e.g. for Charting Libraries)

DUKESCRIPT

UNIVERSITY

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Development **E**nvironment on the **W**eb (**DEW**)

http://dew.apidesign.org/dew/

Your own Gists:

http://dew.apidesign.org/dew/#7548972

Additional Resources

HomePage: http://www.dukescript.com
Blog: http://www.dukescript.com/blog.html
Source Code: https://github.com/dukescript
Community: Google Groups

API Doc: http://bits.netbeans.org/html4j/1.0/net/java/html/json/package-summary.html
Controls4J: http://controlsjs.com/#CONTROLS4J
Leaflet API: https://github.com/eppleton/leaflet4j
MineSweeper Demo: http://xelfi.cz/minesweeper/bck2brwsr/
DEW: http://dew.apidesign.org/dew/

Thank you!

@monacotoni

@DukeScript

We want you for

DukeScript