JS AND PATTERNS

or: How I Learned to Stop Worrying and Love JS Frameworks

@drpicox

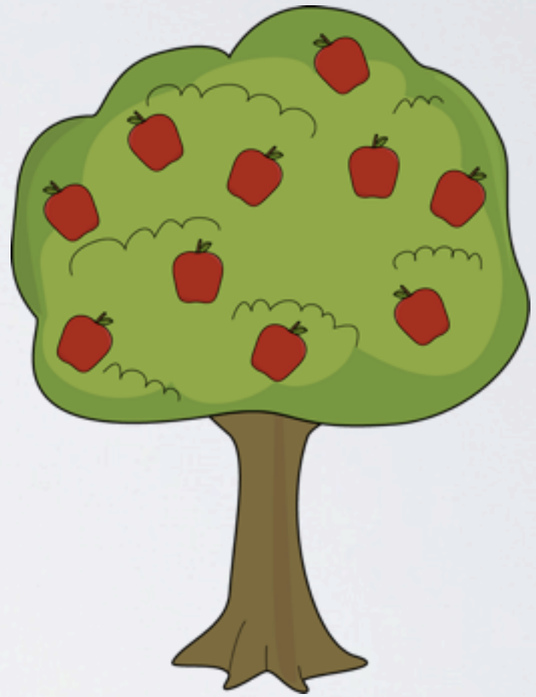
PATTERNS

Model View Controller

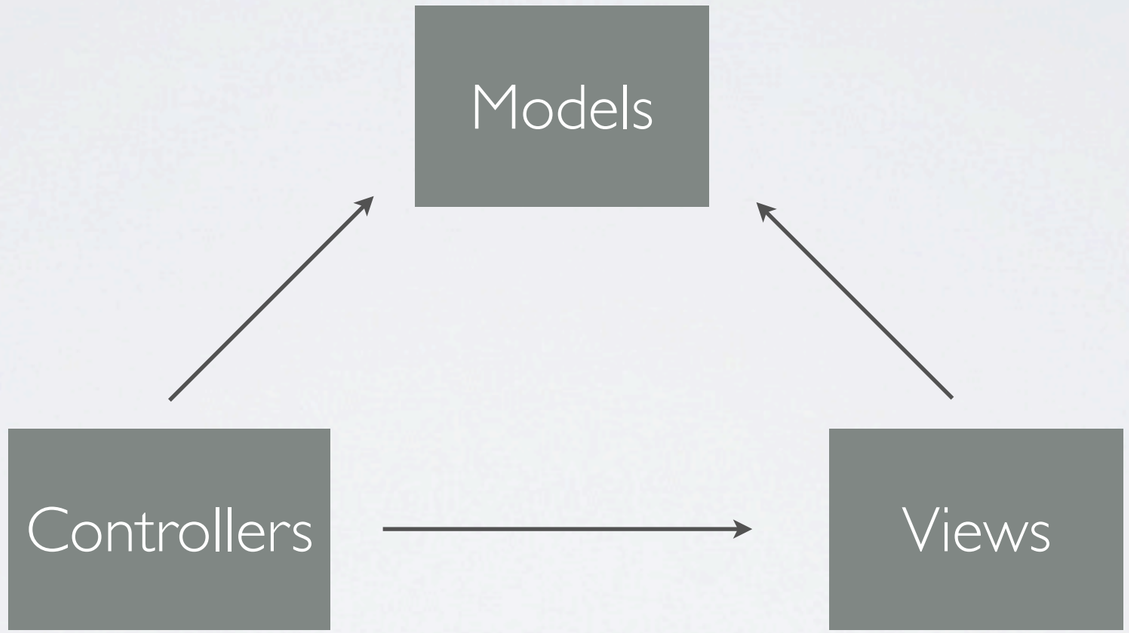
+

High Cohesion & Low Coupling

MODEL VIEW CONTROLLER



MODEL VIEW CONTROLLER



MODEL VIEW CONTROLLER

Model: is almost data

```
user = {
  id: ‘123’,
  name: ‘John’,
  surname: ‘Smith’,
  fullName: function() {
    return this.name+‘ ’+this.surname;
  },
  ...
};
```

MODEL VIEW CONTROLLER

Model: it might be also some view state

```
tabChooser = {
  tabs: [‘introduction’,‘advanced’],
  current: 0,
  next: function() {
    this.current += 1;
    this.current %= this.tabs.length;
  },
  ...
};
```

MODEL VIEW CONTROLLER

Model: knows nothing about Views and Controllers

(it is observed: callbacks, dirtycheck, ...)

```
user.addObserver(userFormView)
```

ex: look for Observer pattern for more info.

MODEL VIEW CONTROLLER

View: is almost html/css

```
<form name="user">
  <label for="name">Name:</label>
  <input name="name" type="text">
  <label for="surname">Surname:</label>
  <input name="surname" type="text">
  <input type="submit" value="Update">
</form>
```

MODEL VIEW CONTROLLER

View: + a little bit of JS

```
userFormView = {
  setUser: function(user) {
    user.addObserver(this);
    this.user = user;
    this.update();
  },
  update: function() {
    this.form.name = user.name;
    this.form.surname = surname;
  },
  ...
};
```

MODEL VIEW CONTROLLER

View: knows nothing about Controllers

(it is used: callbacks, interfaces, ...)

```
userFormView.onSubmit(controller.save)
```

MODEL VIEW CONTROLLER

Controller: is almost everything else

```
user = http.get('/user');
userFormView = new UserFormView();
userFormView.setUser(user);
userFormView.onSubmit(function() {
  http.post('/user', user);
});
viewport.setView(userFormView);
```

MODEL VIEW CONTROLLER

Controller: is almost everything else

```
user = http.get('/user');
userFormView = new UserFormView();
userFormView.setUser(user);
userFormView.onSubmit(function() {
  http.post('/user', user);
});
viewport.setView(userFormView);
```

Be Careful!

Persistence/Service Controller

loads an stores data (may use identity map)

MODEL VIEW CONTROLLER

Controller: is almost everything else

Be Careful!

```
user = http.get('/user');
userFormView = new UserFormView();
userFormView.setUser(user);
userFormView.onSubmit(function() {
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viewport.setView(userFormView);
```
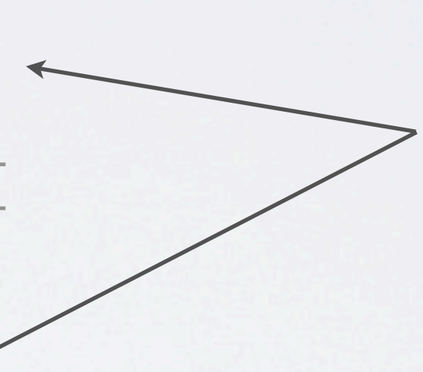



Route
Controller

ex: http://localhost:8080/#/user

MODEL VIEW CONTROLLER

Controller: is almost everything else

Be Careful!

```
user = http.get('/user');
userFormView = new UserFormView();
userFormView.setUser(user);
userFormView.onSubmit(function() {
  http.post('/user', user);
});
viewport.setView(userFormView);
```

View Controller

handle an specific view

MODEL VIEW CONTROLLER

Controller: detect controllers that you need

- Persistence/Service Controllers: load, store, manages models.
  Uses other persistence controllers and models

- View Controllers: prepare and observe views.
  Uses persistence controllers, views and (low) models.

- Route Controllers: select a view to show.
  Uses other controllers, (instance) views and (low) models.

MODEL VIEW CONTROLLER

, or Model View Adapter, or Model View ViewModel, or Model View Presenter

MVC Is NOT a Fashion!

Do not create ternaries of ModelX-ViewX-ControllerX just to follow the pattern. Create models, views and controllers because they make sense, and reuse them!

Use them wisely

COMMON SENSE PATTERNS

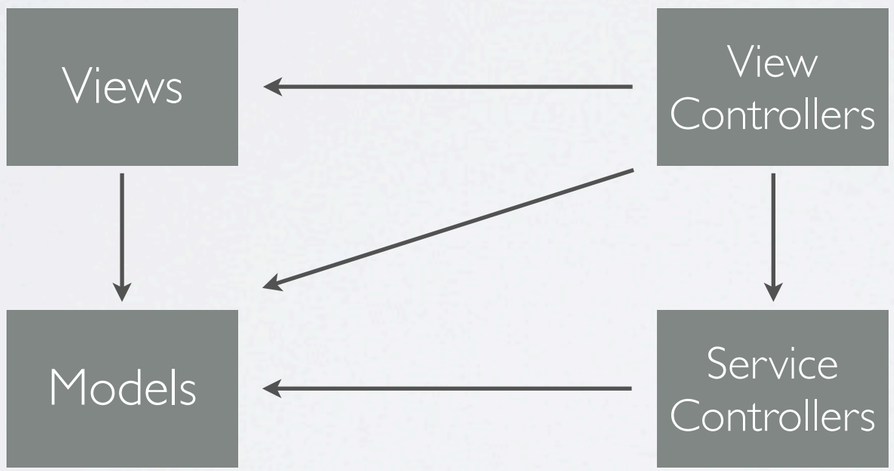
High Cohesion: put related things in the same place

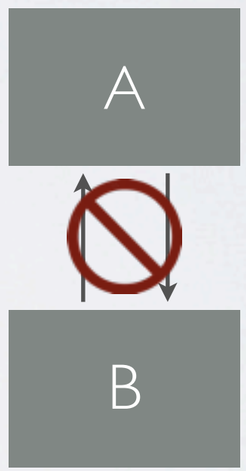
- Persistence Controllers: load/store models of one kind,
- Route Controllers: prepare a view to show,
- View: shows a related information to a user (not a model!),
- Model: describes an entity,
- ...

COMMON SENSE PATTERNS

Low Coupling: minimize what each part knows of other

- Create direction: A knows B, but B must not know A





COMMON SENSE PATTERNS

High Cohesion & Low Coupling

They are the most basic pattern to follow,
many other patterns come from them,
even Model View Controller.

Sunday 25 May 14

MODEL VIEW CONTROLLER

Model: is not html/dom

Please, don't

~~<input name="name" value="John">~~

~~<img class="status" src="success.jpg">~~

Model: is a Javascript object

```
user = {name: "John"};
status = "success";
```

SO...

Model View Controller: use it wisely

High Cohesion and Low Coupling: make it your common sense

Thanks

Code examples:

https://github.com/drpicox/tutorial-js-patterns

Deeper in code

DEEPER CODE

Persistence Controller: remote data accesses (v1)

```
userService = {
  get: function() {
    return http.get('/user');
  },
  save: function(user) {
    http.post('/user', user);
  },
};
```

Simple get and save, of data.

DEEPER CODE

Persistence Controller: remote data accesses (v2)

```
userService = {
  get: function() {
    return $http.get('/user').
    then(function (response) {
      var user = new User(response.data);
      return user;
    });
  },
  save: function(user) {
    return $http.post('/user', user);
  },
};
```

Recover data and create model instances.

DEEPER CODE

Persistence Controller: remote data accesses (v3)

```
    instance = null;
userService = {
  get: function() {
    if (instance) { return instance; }
    return instance = $http.get('/user').
    then(function (response) {
      var user = new User(response.data);
      return user;
    });
  },
  ...
};
```

Keep track of recovered instances. Not double loading, always same instance for same data. (have key? Identity map)

DEEPER CODE

View Controller: it makes the view alive

```
function UserFormController(view, user) {
  view.user = user;
  view.save = function() {
    userService.save(user);
  };
}
```

For Java programmers: imagine that view satisfies a interface.
For AngularJS programmers: view is indeed $scope.

DEEPER CODE

Route Controller: it shows what user wants (v1)

```
routeManager.when('/user', function() {
  var user = userService.get();
  var view = new UserFormView();
  var controller = new UserFormController(view, user);
  viewport.setView(view);
});
```

DEEPER CODE

Route Controller: it shows what user wants (v2)

```
routeManager.when('/user', function() {
  userService.get().
  then(function (user) {
    var view = new UserFormView();
    var controller = new UserFormController(view, user);
    viewport.setView(view);
  });
});
```

Wait for it :-)

DEEPER CODE

View: jQuery version

```
// this{ user, save }
function UserFormView() {
  var view = this;
  view.template = ‘userForm.tpl.html’;
  view.link = function(dom) {
    $(‘input[name=“name”]’).attr(‘value’,view.user.name);
    $(‘form’).submit(function() {
      view.save();
    });
  };
  ...
}
```

DEEPER CODE

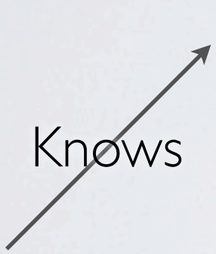
View: AngularJS version

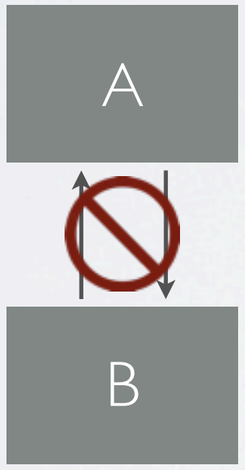
```
<form ng-submit="save()">
  <label>Name:</label>
  <input ng-model="user.name" type="text">
  <label>Surname:</label>
  <input ng-model="user.surname" name="surname" type="text">
  <input type="submit" value="Update">
</form>
```

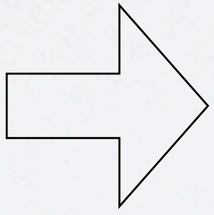
COMMON SENSE PATTERNS

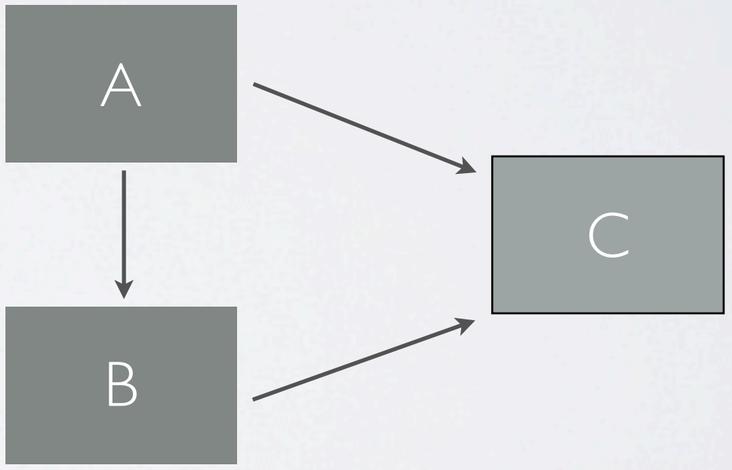
Low Coupling: minimize what each part knows of other

- Create direction: A knows B, but B must not know A









No circles!

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When to use them?

Multiple Page Application

- PHP/JSP/RoR/... controls flow
- SEO oriented
- Server delivers anything
- Application session is in Server
- ~~Just jQuery~~

Single Page Application

- JS controls the application flow
- SEO requires pre-render
- Server delivers assets and API
- Application session is in JS
- JS framework recommended

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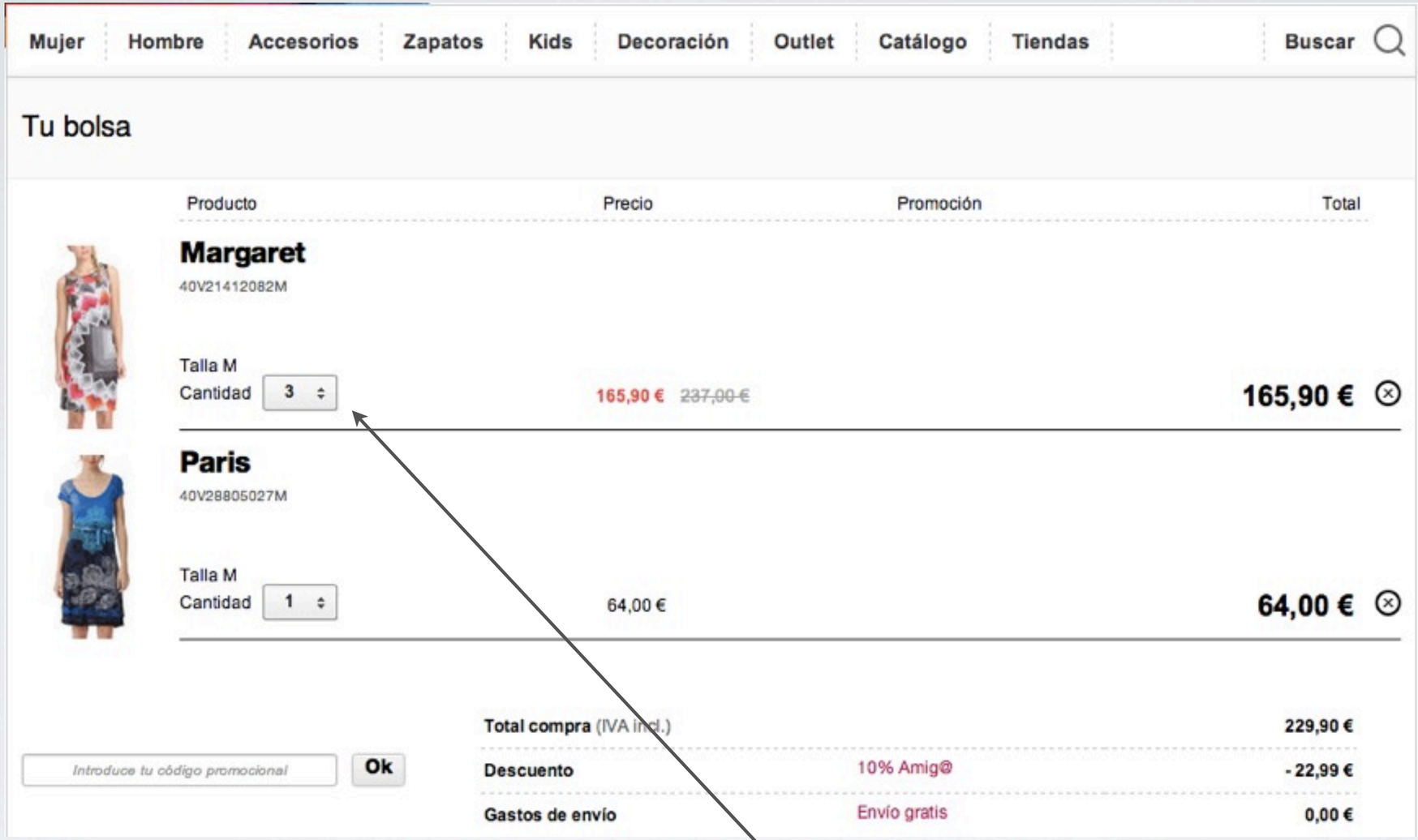

No one wants to wait here

So...

Multiple Page Applications also requires some JS framework