APEX Interactive Grids: Standardize

for Sanity

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@thtechnology

NYOUG

VISCOSITY NORTH AMERICA

About Me …

- TH TECHNOLOGY – Oracle Consulting Services, APEX Focus
- Mechanical/SW Engineer - Analyzed, designed, developed, converted, upgraded, enhanced legacy & Oracle database applications for 30+ Years
- Web/APEX applications for Govt, Medical, Engineering, Fisheries since HTMLDB
- ODTUG Vice President, Editor Emeritus, Technical Journal
- APress Author
- Oracle ACE Director

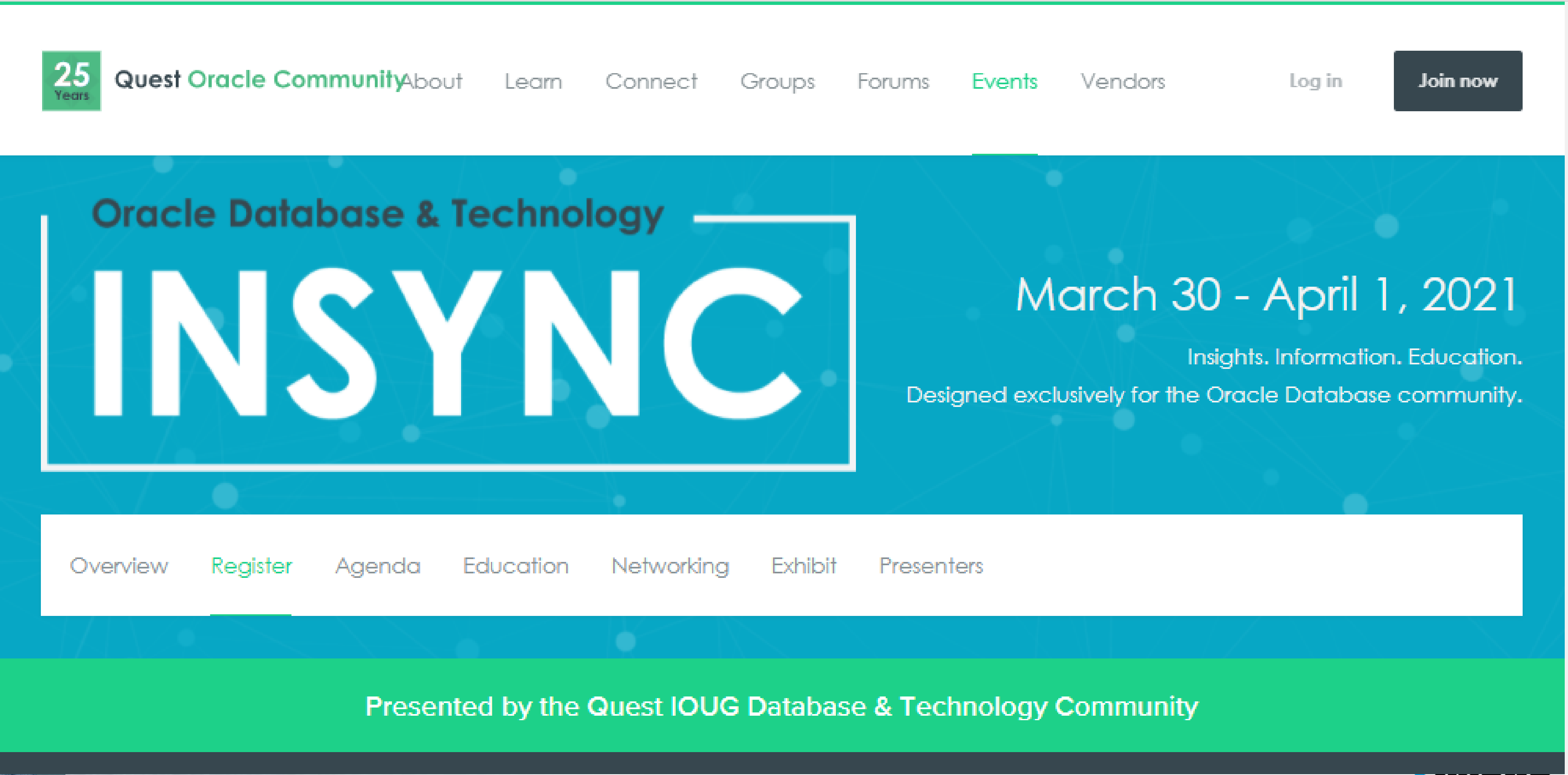
ODTUG

NYOUG

TH Technology

#StaySafe
#FlattenTheCurve
#StayVigilant

#Vaccinate



Oracle Database & Technology

INSYNC

March 30 - April 1, 2021

Insights. Information. Education.

Designed exclusively for the Oracle Database community.

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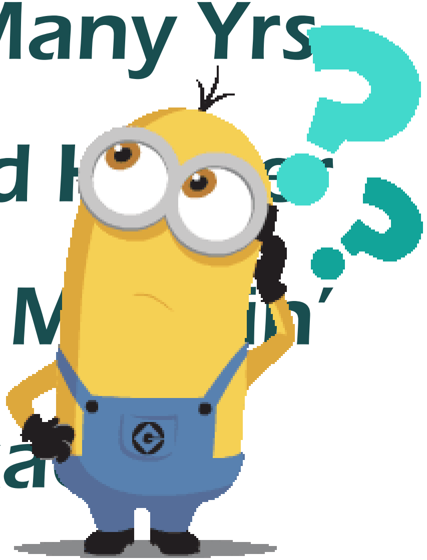
ODTUG Kscope21

virtual event june21-july1

About You …

- APEX Experience?
- APEX Versions?
- Grid Experience?
- JavaScript Experts?

- <1 to Many Yrs
- 5.1 and H
- Fair to M in’
- Not Exa



STANDARDIZE

Your

Interactive Grids

Why ~ How ~ Best Practices

What is Oracle APEX?

Oracle Application Express (APEX) is a low-code development platform that enables you to build scalable, secure enterprise apps, with world-class features, that can be deployed anywhere.

Interactive Grid Customization Leaves **LOW CODE** Behind …

So … **Standardize**

Interactive Grid

(Interactive Report or Tabular Form)

+ <All the Features You Ever Wanted>

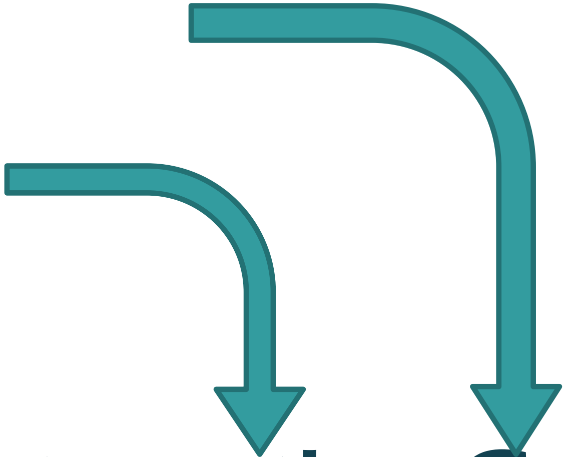
(Thank You APEX Team!)

Interactive Grid

Direction

~~Interactive Report~~

~~Tabular Form~~



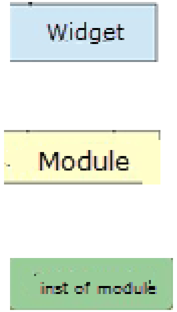
Future

Now

Interactive Grid

TH TECHI

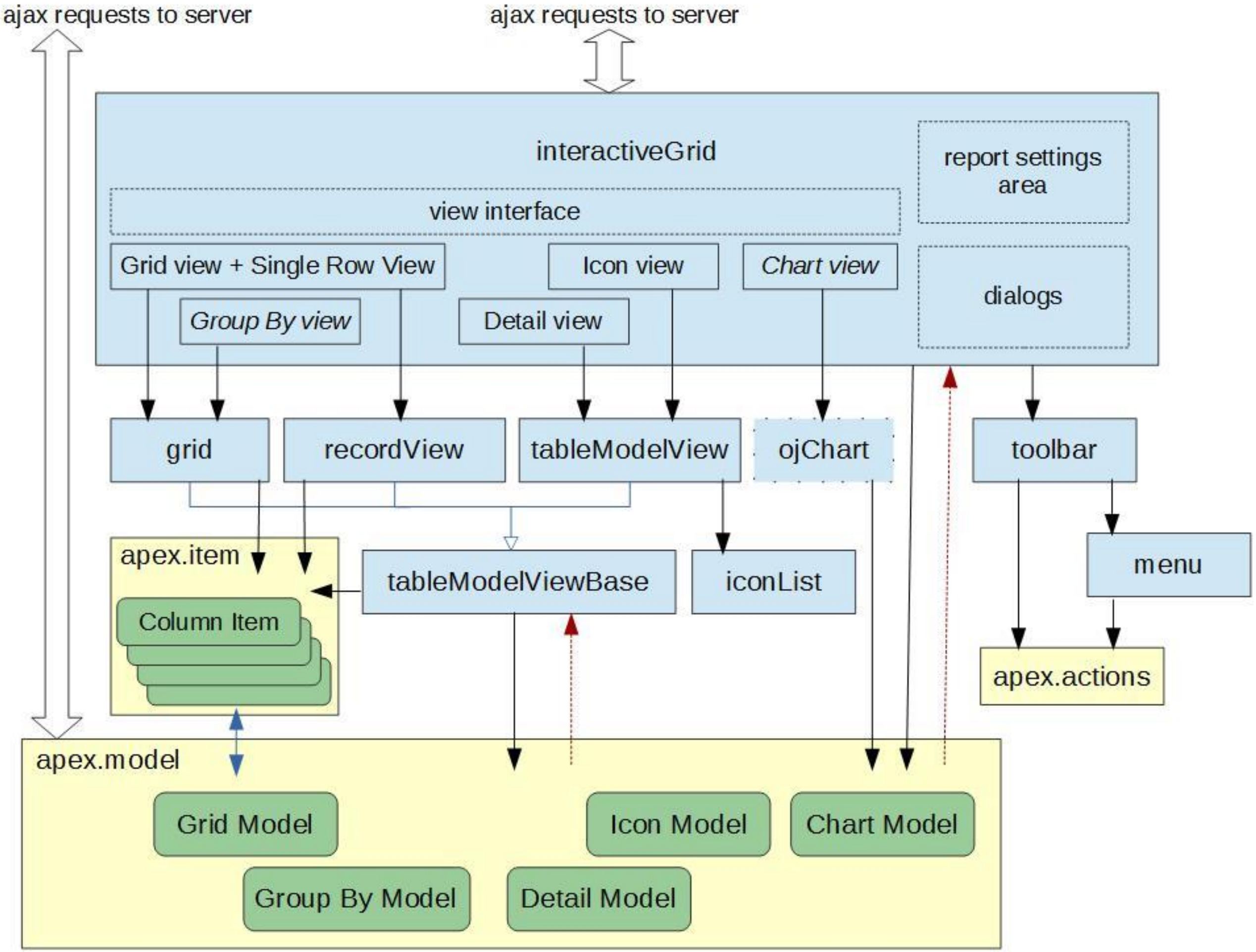
IGrid Architecture



Interactive Grid – Under the Hood

J Snyders

http://hardlikesoftware.com/weblog/2016/06/08/interactive-grid-under-the-hood/

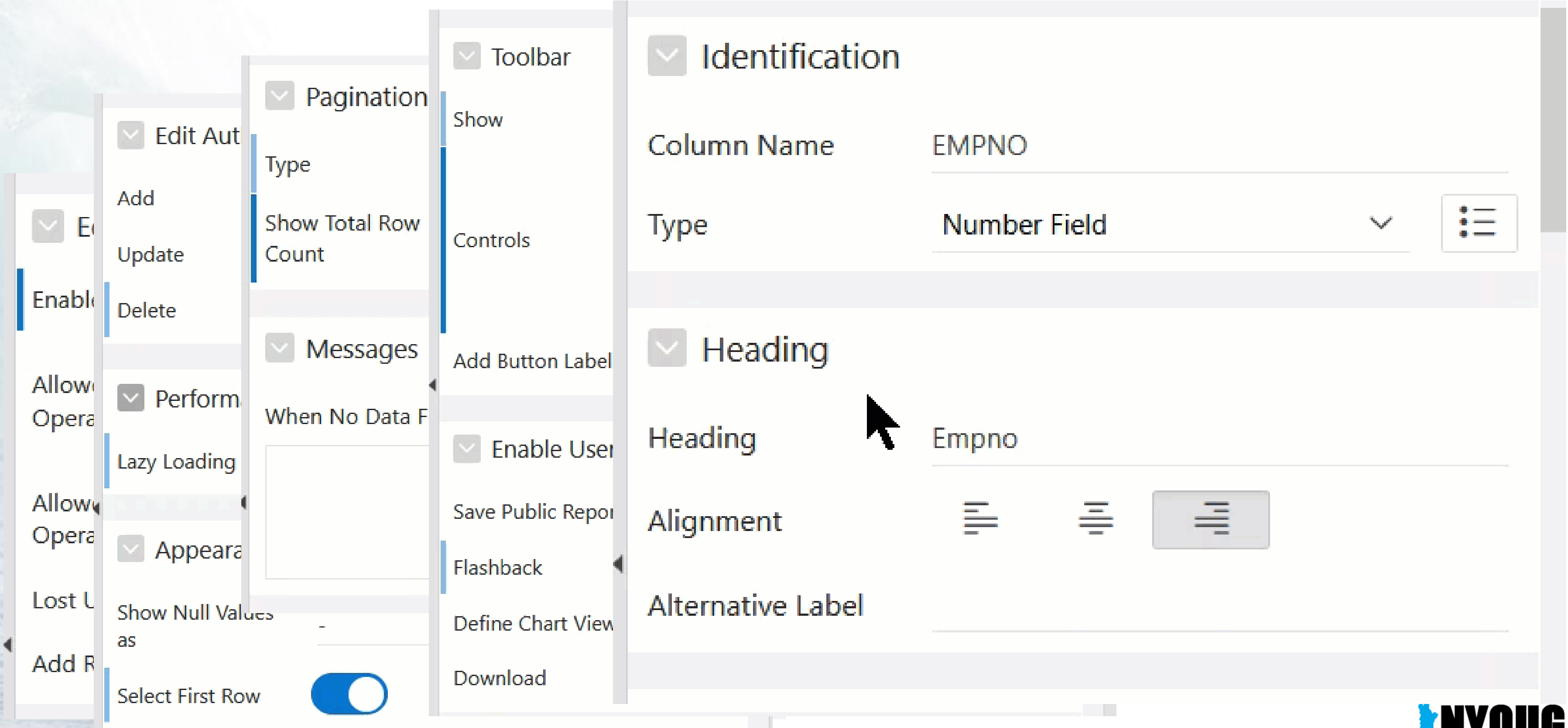

ajax requests to server
ajax requests to server
interactiveGrid
report settings area
view interface
Grid view + Single Row View
Icon view
Chart view
Group By view
Detail view
dialogs
grid
recordView
tableModelView
ojChart
toolbar
menu
apex.item
Column Item
tableModelViewBase
iconList
apex.actions
apex.model
Grid Model
Icon Model
Chart Model
Group By Model
Detail Model

Settings and Configurations

- Do It Declaratively First

LOW CODE

Lots of Declarative Settings



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Add

Update

Delete

Perform

Lazy Loading

Appeara

Show Null Values as -

Select First Row

Pagination

Type

Show Total Row Count

Messages

When No Data F

Toolbar

Show

Controls

Add Button Label

Enable User

Save Public Repor

Flashback

Define Chart View

Download

Identification

Column Name EMPNO

Type Number Field

Heading

Heading Empno

Alignment

Alternative Label

Not All is Declarative …

- Turn Column Header Off
- Add/Remove Toolbar Buttons /Actions
- Add/Remove Action Menu Options

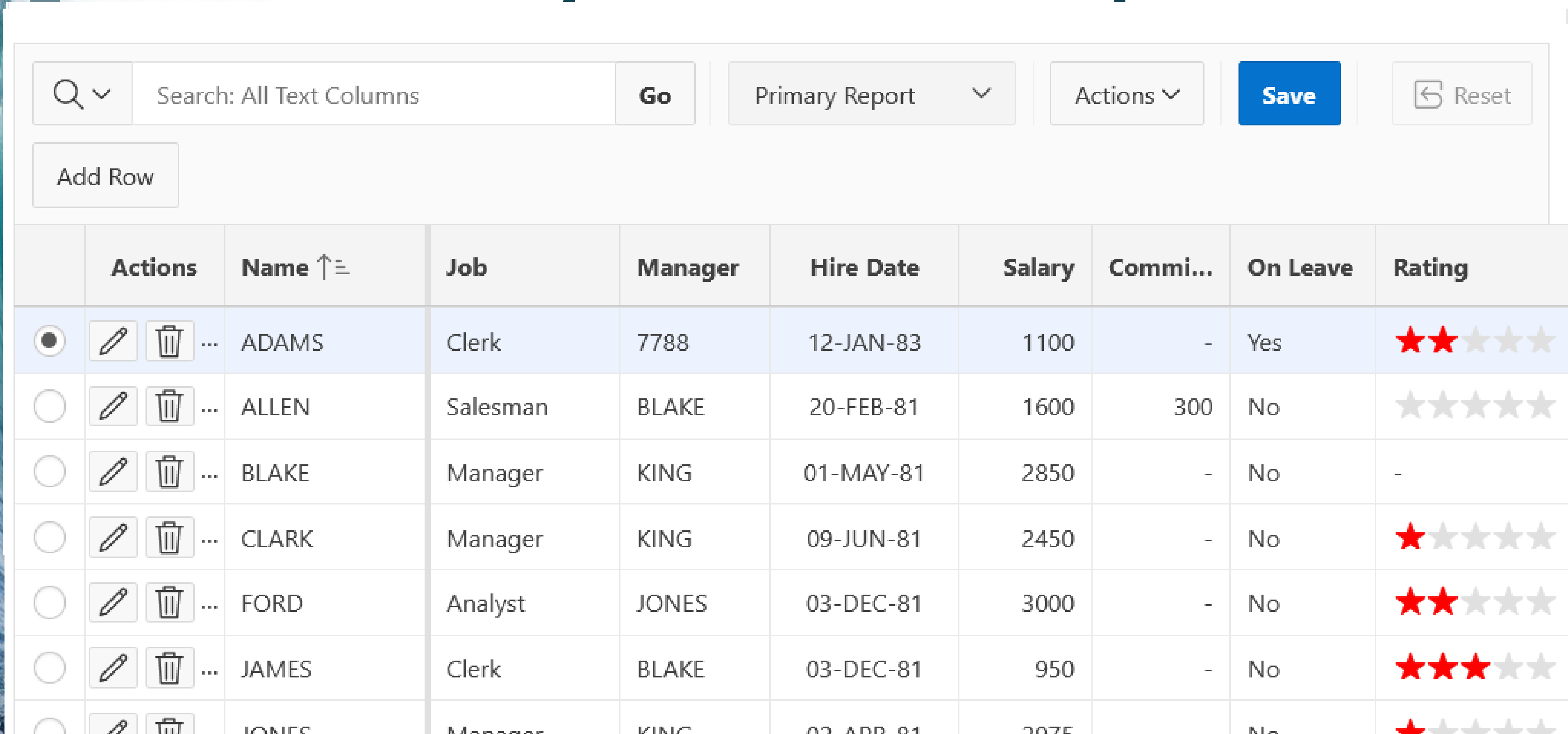
Not All is Declarative …

- Turn Column Header Off
    - Code in Column Advanced → JavaScript
- Add/Remove Toolbar Buttons /Actions
    - Code in Grid Advanced → JavaScript
- Add/Remove Action Menu Options
    - Code in Page Advanced → JavaScript

Most Grids are a Combination

- Declarative
- Customizations

Grid Configuration Examples



	Actions	Name ↑	Job	Manager	Hire Date	Salary	Commi...	On Leave	Rating
●	✎ 🗑 ...	ADAMS	Clerk	7788	12-JAN-83	1100	-	Yes	★★☆☆☆
○	✎ 🗑 ...	ALLEN	Salesman	BLAKE	20-FEB-81	1600	300	No	☆☆☆☆☆
○	✎ 🗑 ...	BLAKE	Manager	KING	01-MAY-81	2850	-	No	-
○	✎ 🗑 ...	CLARK	Manager	KING	09-JUN-81	2450	-	No	★☆☆☆☆
○	✎ 🗑 ...	FORD	Analyst	JONES	03-DEC-81	3000	-	No	★★☆☆☆
○	✎ 🗑 ...	JAMES	Clerk	BLAKE	03-DEC-81	950	-	No	★★★☆☆
○	✎ 🗑 ...	JONES	Manager	KING	02-APR-81	2975		No	★☆☆☆☆

Grid Customization Examples

- We can customize Grid columns to behave like these …

Consider …

- 5 Developers ➔ 5 Different Grids
- 5 Developers, Same App

➔ 5 Different Grids

COMMUNICATE

SHARE

Consider …

- 1 Developer, 5 Days
  ➔ 5 Different Grids
- 1 Developer, 5 Apps
  ➔ 5 Different Grids

STANDARDS …

SLEEP or COFFEE or SANITY

Mixed Up Application Examples

- Different Grid Appearance
- Different Grid Functions
- Different Column Names, Order, Size
- Different Pagination
- Different Edit Modes, Validations, Messages

W/O Standards,
Stuff Happens

This seems so
HARD!

Why Standardize Your Grids?

- User Experience
- User Sanity (Your Reputation)
- Developer Development and Maintenance
- Developer Sanity

Standardize: User Experience

- Column Names, Types, Order, Size
- Toolbar Configuration
- Button Names, Placement, Actions
  - “Add Row” vs “Add Employee”
  - Text vs Icons vs Both
- Pagination, # Rows Displayed, Shading

Standardize: Developer Experience

- No Guessing
- No Reinventing the Wheel
- Directions
- Common Code Base, Settings
- Use Your JavaScript Experts

Standardize

1. Have Standards
2. Use Your Standards
3. **Share** Configuration Settings, Code
4. **Really** Use Your Standards

Grid Standards

- Features
  - Buttons, Pagination, Actions, Shortcuts
  - Views: Chart, GB, Icon, Detail
- Template
- Column
  - Name, Format, Alignment, Order

How to Standardize Grids

- Cheat Sheet of Grid Settings, Config
- Build One and Copy/Duplicate
- Build a Plugin
- Use a Plugin*
- Use a Common Configuration File

Let's Take A Look …

Do It Declaratively First

… but Be Careful w Declarative in Combo w Customizations

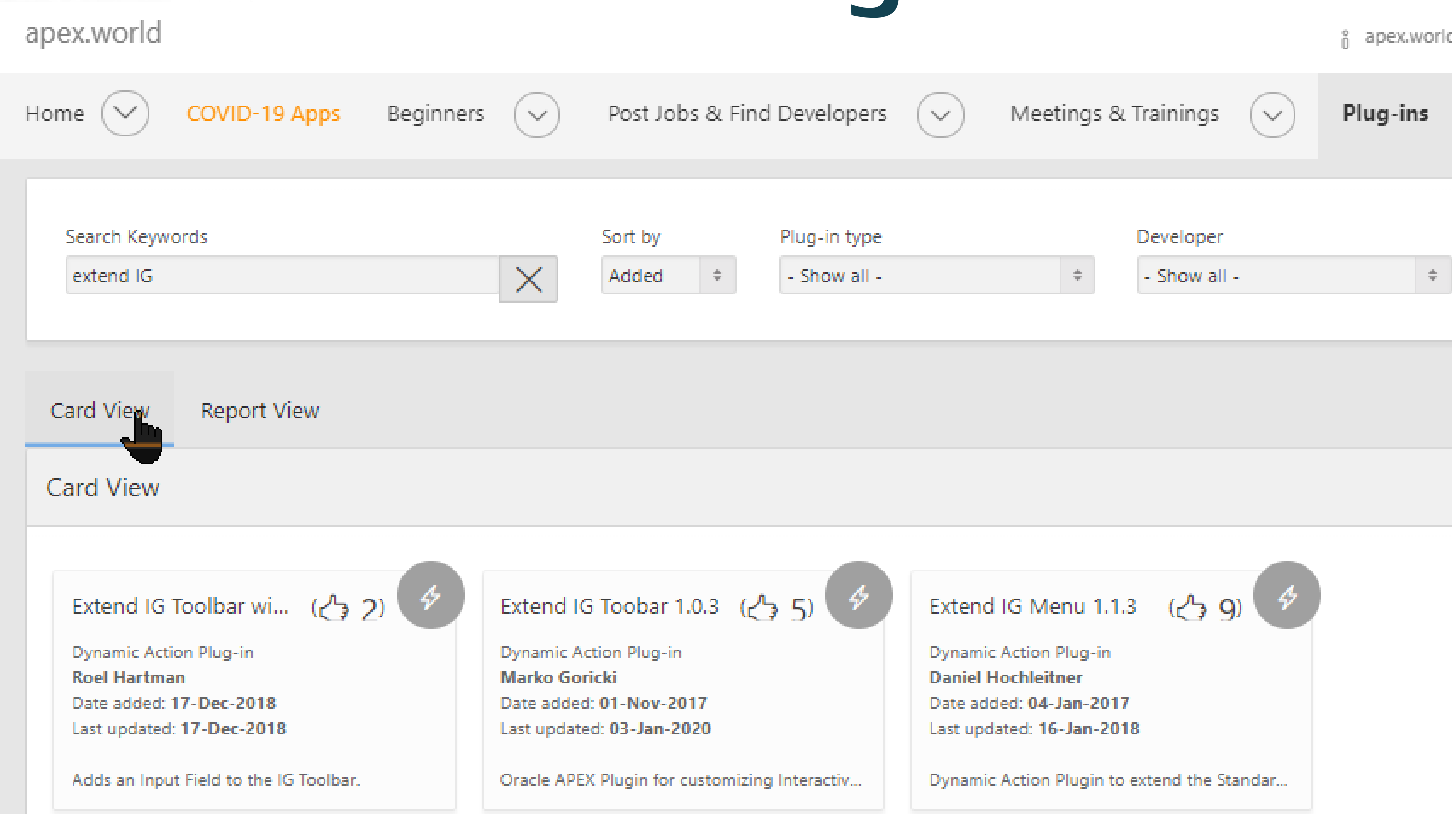
(Don't Hang Yourself)

- Example of Declaratively Turning Off Edit, Save button
- Custom Code to Limit Buttons

- Example of Column Heading Settings
- Custom Code for 3 types of settings, mix of declarative and code
- Freeze vs noHeaderActivate and Sort
- noReorder

There's A Plugin for That …

There's A Few Plugins Now…



apex.world

Search Keywords: extend IG

Sort by: Added

Plug-in type: - Show all -

Developer: - Show all -

Card View

Extend IG Toolbar wi… (👍 2)
Dynamic Action Plug-in
Roel Hartman
Date added: **17-Dec-2018**
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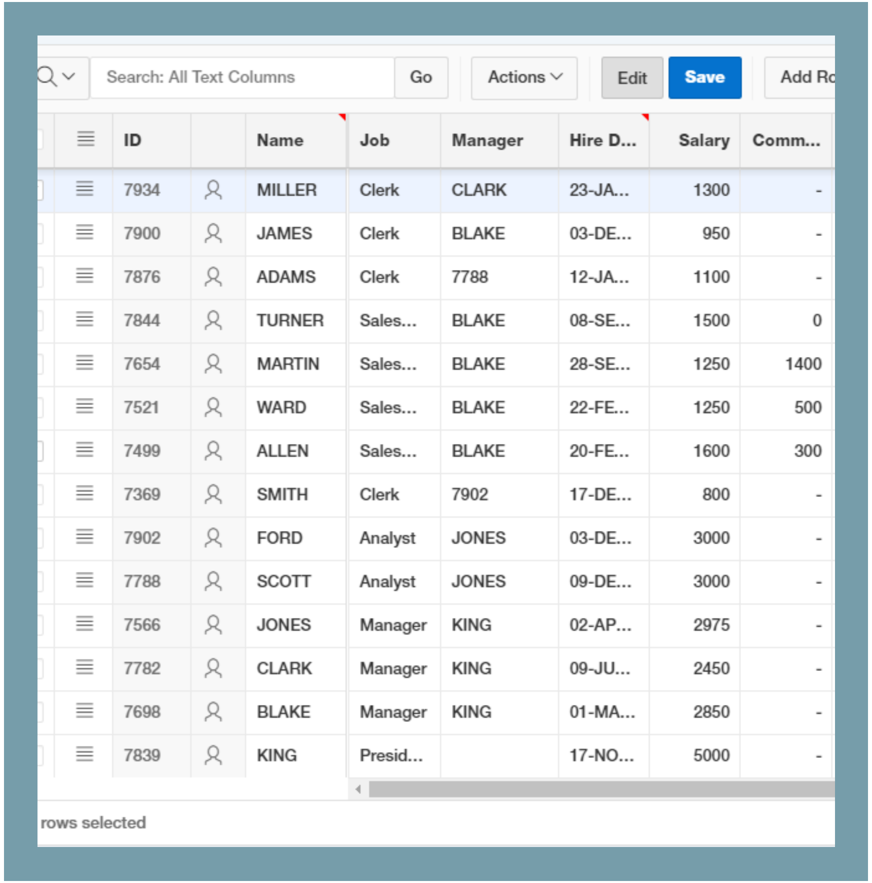
- Just Makes It Easier (Less Code) to Customize …

APEX Interactive Grid: Standardize

JavaScript APIs



ID		Name	Job	Manager	Hire D...	Salary	Comm...
7934		MILLER	Clerk	CLARK	23-JA...	1300	-
7900		JAMES	Clerk	BLAKE	03-DE...	950	-
7876		ADAMS	Clerk	7788	12-JA...	1100	-
7844		TURNER	Sales...	BLAKE	08-SE...	1500	0
7654		MARTIN	Sales...	BLAKE	28-SE...	1250	1400
7521		WARD	Sales...	BLAKE	22-FE...	1250	500
7499		ALLEN	Sales...	BLAKE	20-FE...	1600	300
7369		SMITH	Clerk	7902	17-DE...	800	-
7902		FORD	Analyst	JONES	03-DE...	3000	-
7788		SCOTT	Analyst	JONES	09-DE...	3000	-
7566		JONES	Manager	KING	02-AP...	2975	-
7782		CLARK	Manager	KING	09-JU...	2450	-
7698		BLAKE	Manager	KING	01-MA...	2850	-
7839		KING	Presid...		17-NO...	5000	-

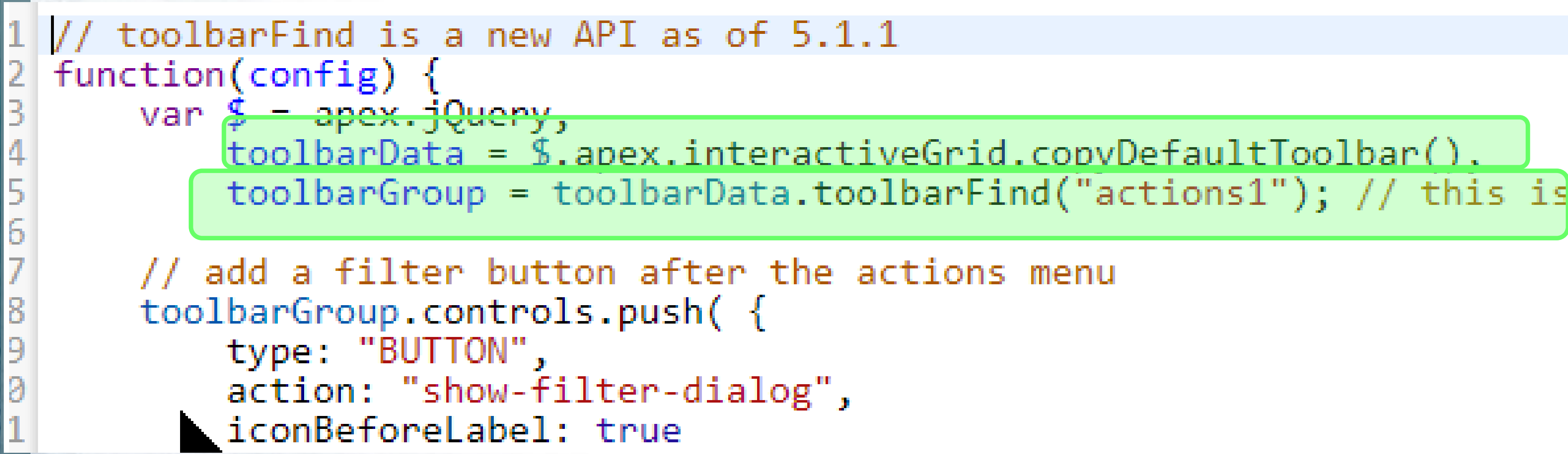
rows selected

Documented JS APIs

- APEX 18.1+
- Documented == **Supported**

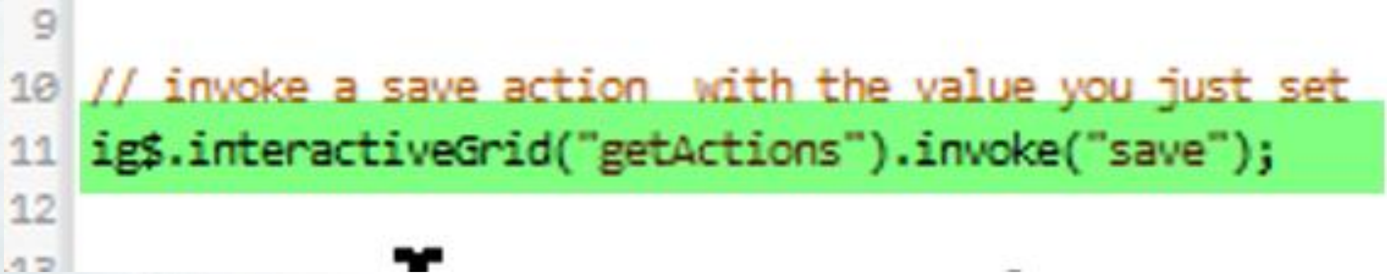
https://apex.oracle.com/jsapi

interactiveGrid - Customizations



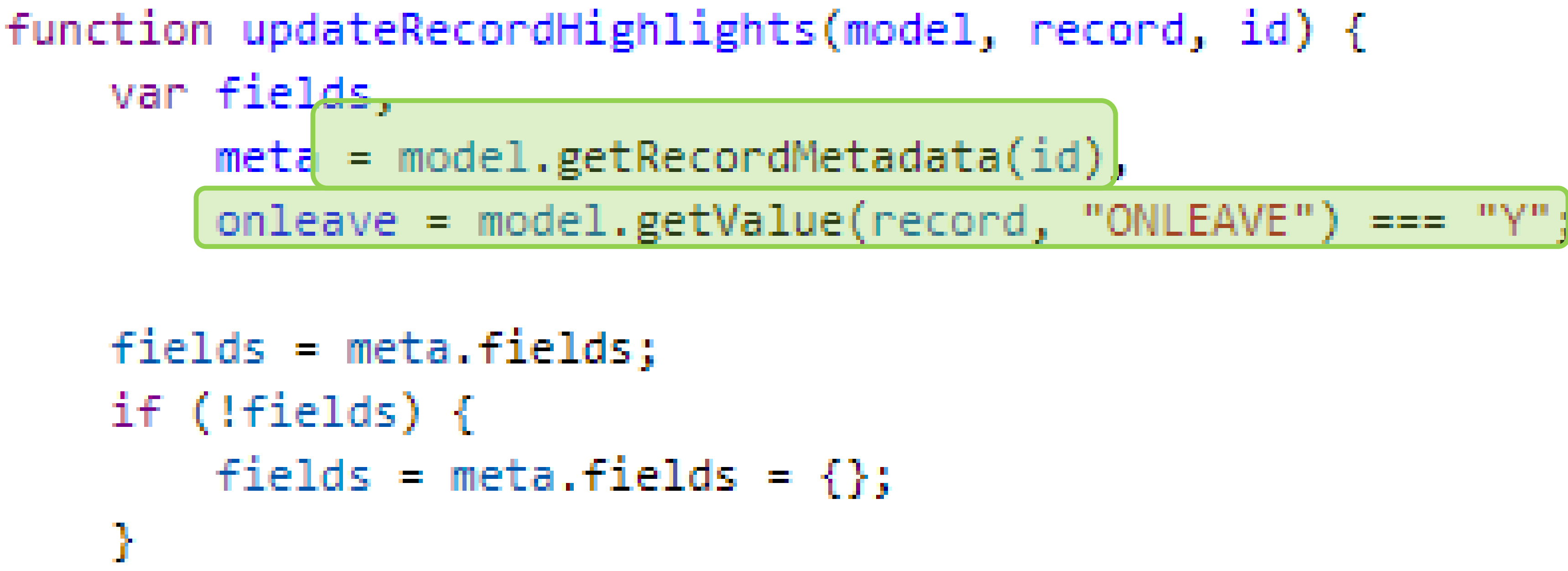
```
// toolbarFind is a new API as of 5.1.1
function(config) {
    var $ = apex.jQuery,
        toolbarData = $.apex.interactiveGrid.copyDefaultToolbar(),
        toolbarGroup = toolbarData.toolbarFind("actions1"); // this is

    // add a filter button after the actions menu
    toolbarGroup.controls.push( {
        type: "BUTTON",
        action: "show-filter-dialog",
        iconBeforeLabel: true
```

interactiveGrid – Save



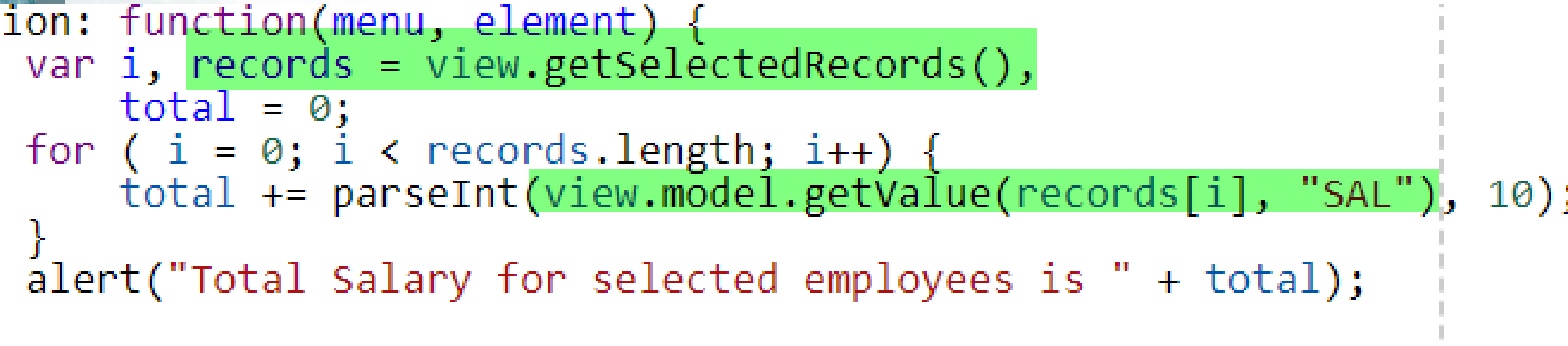
```
// invoke a save action  with the value you just set
ig$.interactiveGrid("getActions").invoke("save");
```

model When Accessing Data



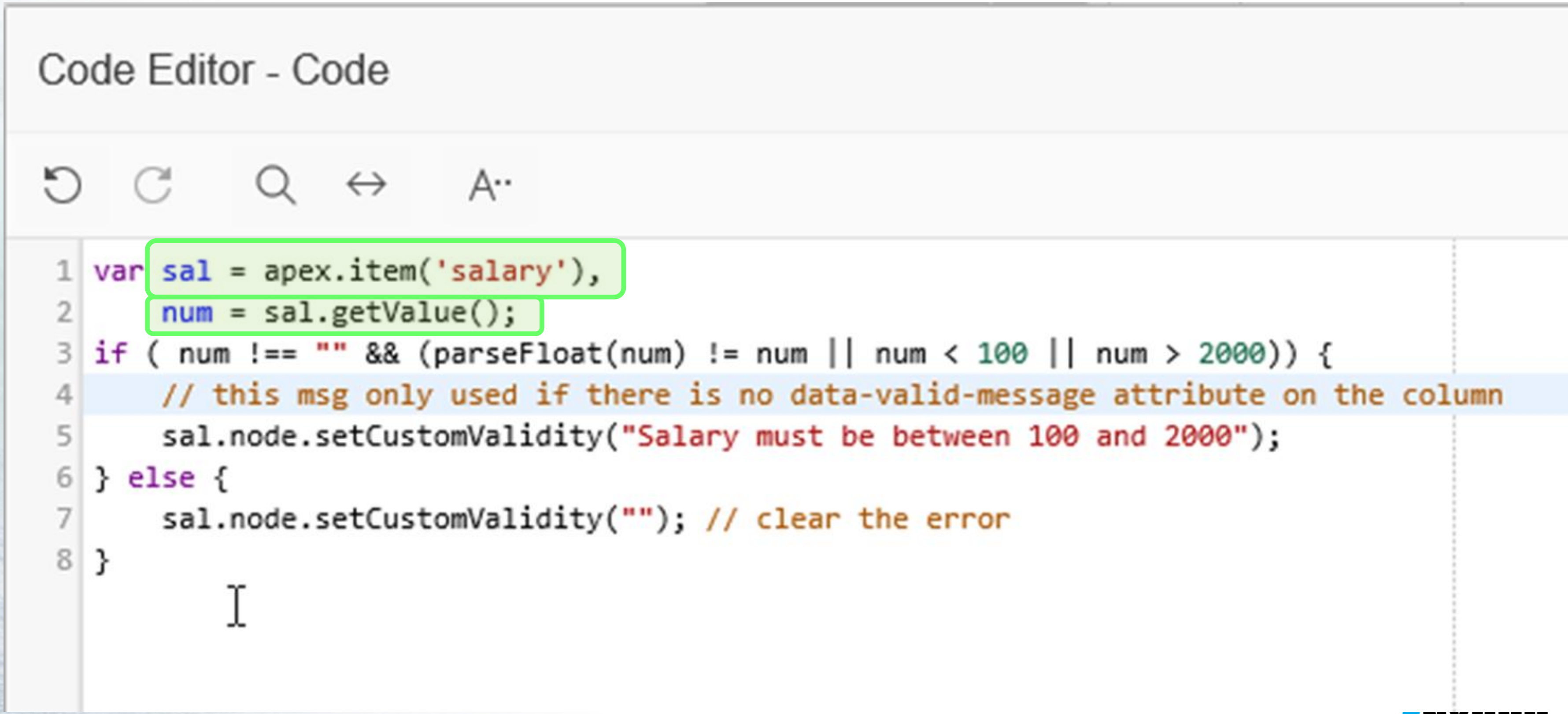
```
function updateRecordHighlights(model, record, id) {
    var fields,
        meta = model.getRecordMetadata(id),
        onleave = model.getValue(record, "ONLEAVE") === "Y";

    fields = meta.fields;
    if (!fields) {
        fields = meta.fields = {};
    }
```

Access the Model …



```
ion: function(menu, element) {
 var i, records = view.getSelectedRecords(),
     total = 0;
 for ( i = 0; i < records.length; i++) {
     total += parseInt(view.model.getValue(records[i], "SAL"), 10);
 }
 alert("Total Salary for selected employees is " + total);
```

apex.item in Dyn Action Validations

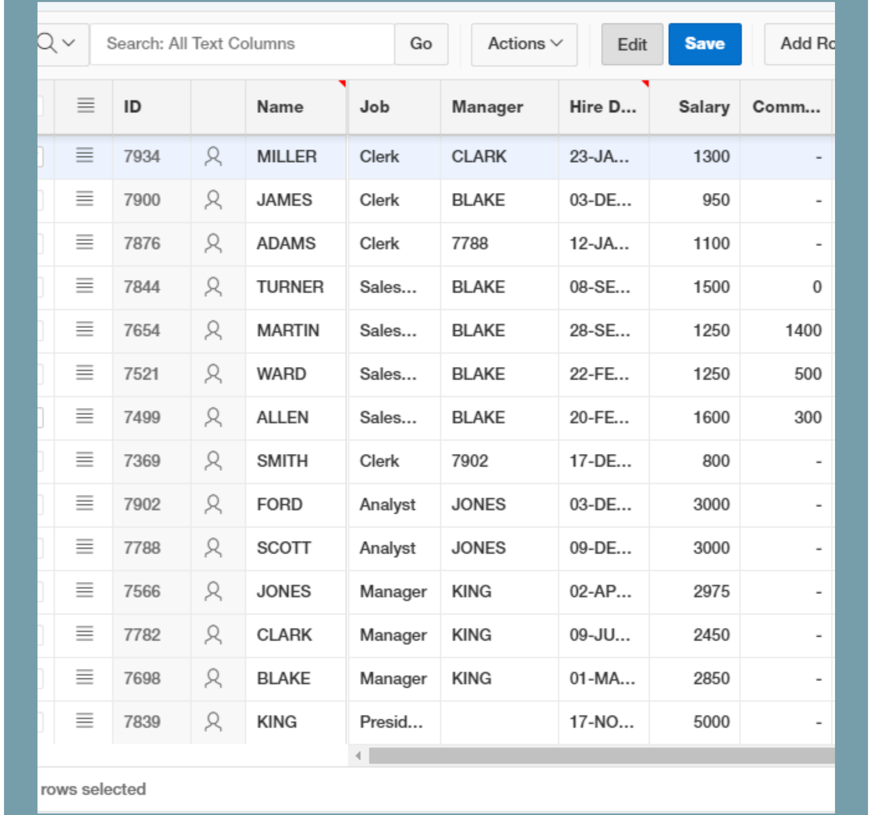


```
var sal = apex.item('salary'),
    num = sal.getValue();
if ( num !== "" && (parseFloat(num) != num || num < 100 || num > 2000)) {
    // this msg only used if there is no data-valid-message attribute on the column
    sal.node.setCustomValidity("Salary must be between 100 and 2000");
} else {
    sal.node.setCustomValidity(""); // clear the error
}
```

APEX Interactive Grid: Standardize

Customizations

for Menus, Toolbars and More



	ID		Name	Job	Manager	Hire D...	Salary	Comm...
≡	7934	👤	MILLER	Clerk	CLARK	23-JA...	1300	-
≡	7900	👤	JAMES	Clerk	BLAKE	03-DE...	950	-
≡	7876	👤	ADAMS	Clerk	7788	12-JA...	1100	-
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≡	7902	👤	FORD	Analyst	JONES	03-DE...	3000	-
≡	7788	👤	SCOTT	Analyst	JONES	09-DE...	3000	-
≡	7566	👤	JONES	Manager	KING	02-AP...	2975	-
≡	7782	👤	CLARK	Manager	KING	09-JU...	2450	-
≡	7698	👤	BLAKE	Manager	KING	01-MA...	2850	-
≡	7839	👤	KING	Presid...		17-NO...	5000	-

rows selected

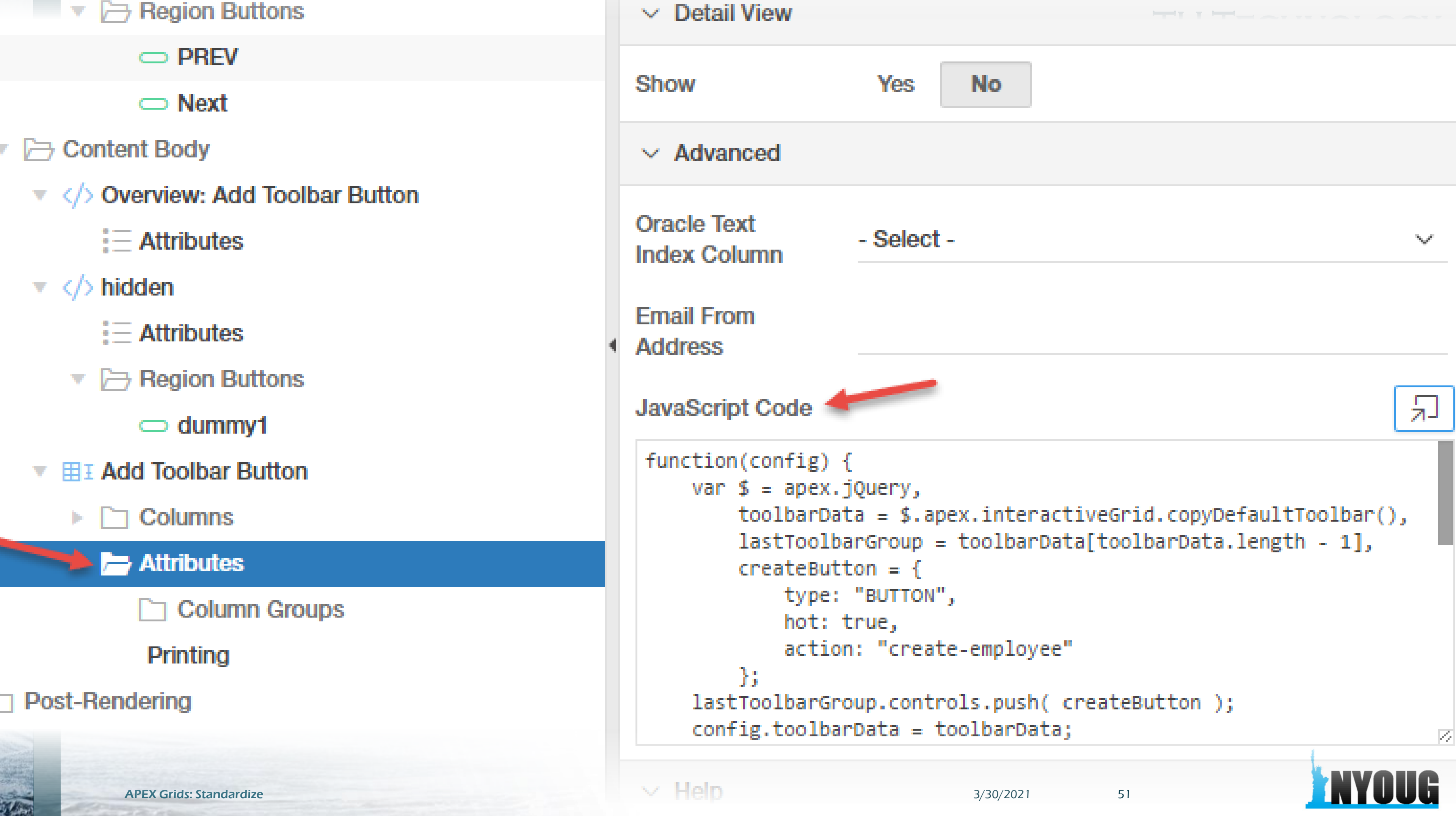
Customizations

- ***Advanced → JavaScript Code***
  - Grid → Grid Menus
  - Column → Column Menu

    (Most of the Time…)

- Read Documented APIs to Learn What is Possible
- Read Hardlikesoftware.com
- Study IG Cookbook App

No Longer PL/SQL Collections ~ Now JavaScript



Show Yes [✓ No]

Oracle Text Index Column: - Select -

Email From Address

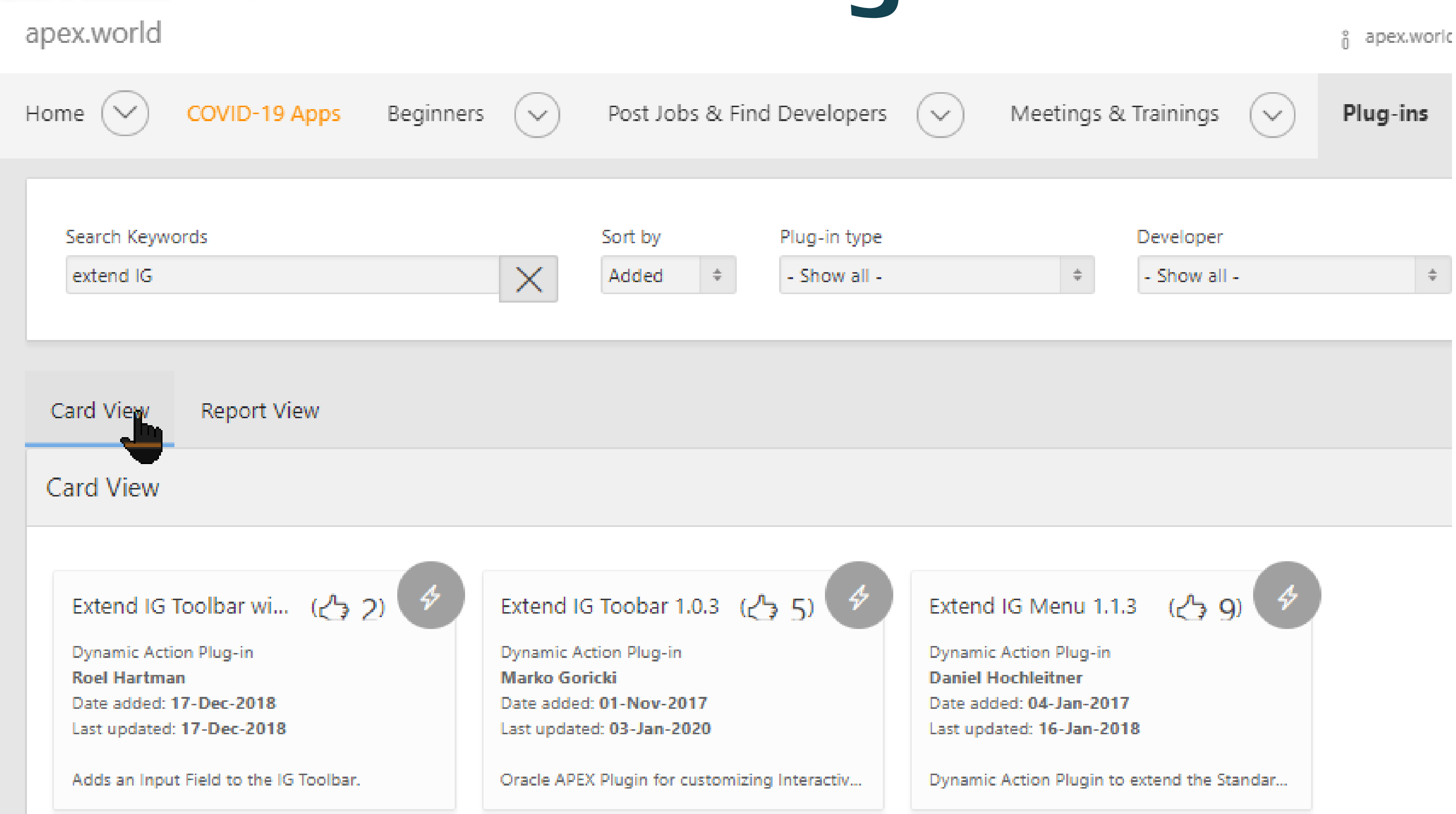
JavaScript Code

```
function(config) {
    var $ = apex.jQuery,
        toolbarData = $.apex.interactiveGrid.copyDefaultToolbar(),
        lastToolbarGroup = toolbarData[toolbarData.length - 1],
        createButton = {
            type: "BUTTON",
            hot: true,
            action: "create-employee"
        };
    lastToolbarGroup.controls.push( createButton );
    config.toolbarData = toolbarData;
```

Customization Examples

- Change Toolbar
- Change Column Heading Menu
- Change RowAction Menu
- Change Toolbar Actions Menu
- Standardize w “Global” Settings

There's A Few Plugins Now…



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Search Keywords: extend IG

Sort by: Added

Plug-in type: - Show all -

Developer: - Show all -

Card View | Report View

Card View

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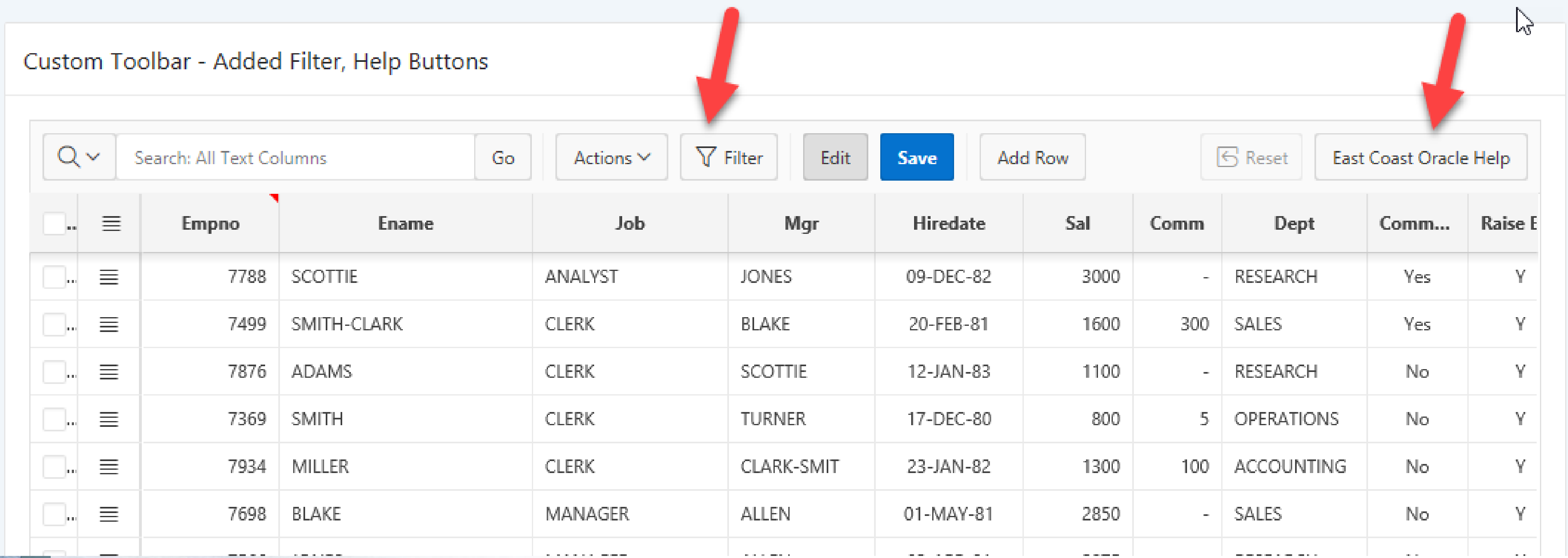
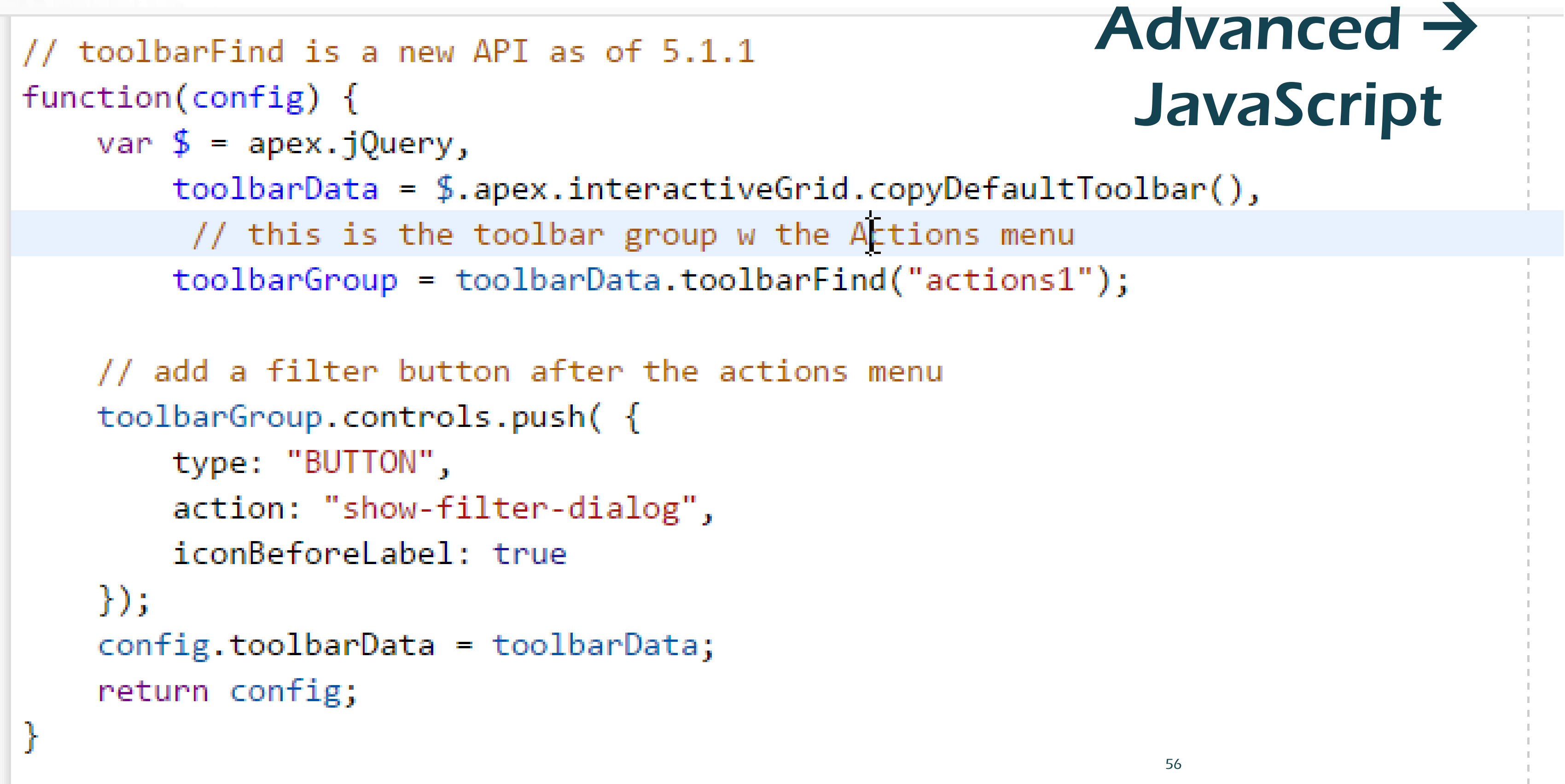


Custom Toolbar - Added Filter, Help Buttons

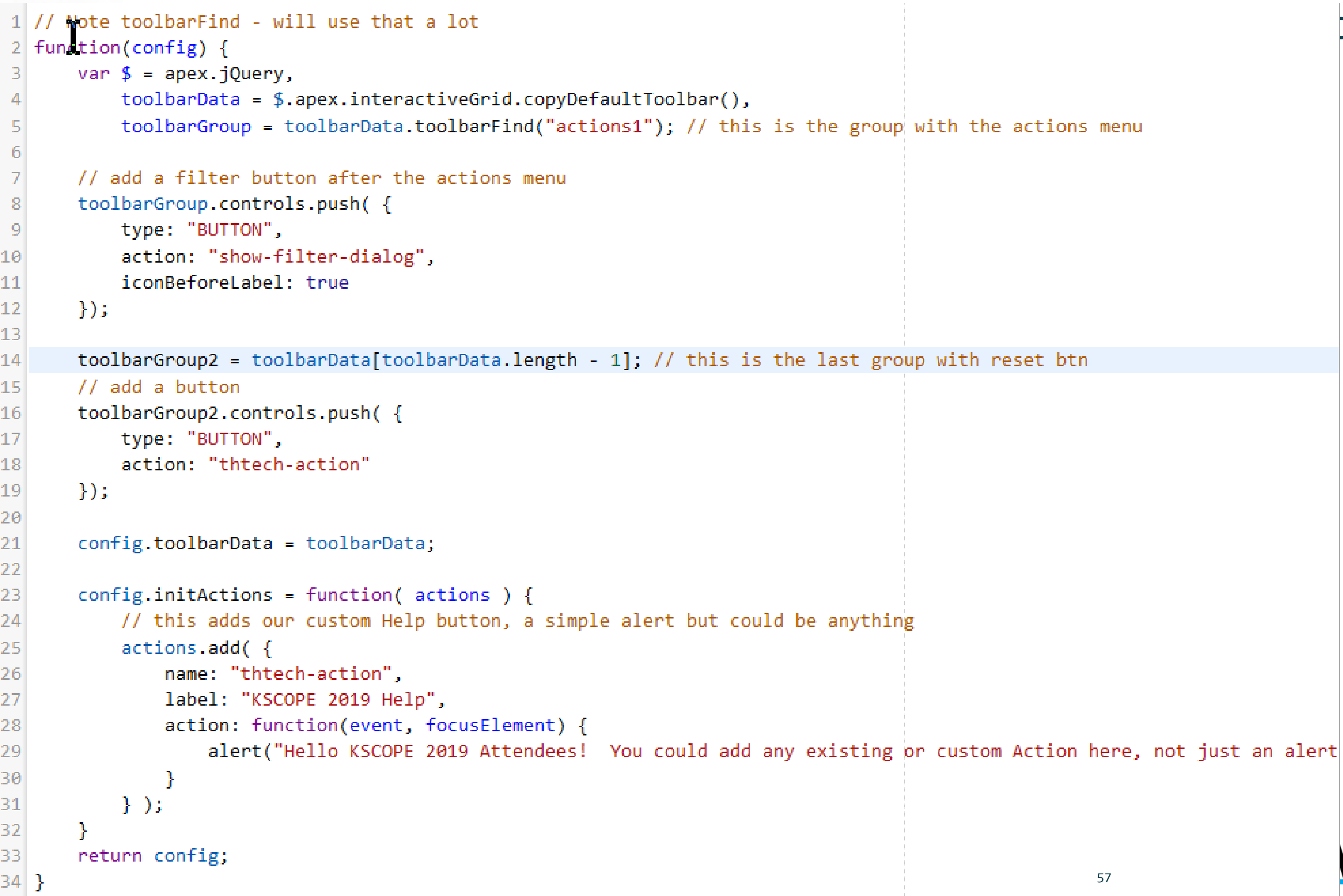
Empno	Ename	Job	Mgr	Hiredate	Sal	Comm	Dept	Comm...	Raise E
7788	SCOTTIE	ANALYST	JONES	09-DEC-82	3000	-	RESEARCH	Yes	Y
7499	SMITH-CLARK	CLERK	BLAKE	20-FEB-81	1600	300	SALES	Yes	Y
7876	ADAMS	CLERK	SCOTTIE	12-JAN-83	1100	-	RESEARCH	No	Y
7369	SMITH	CLERK	TURNER	17-DEC-80	800	5	OPERATIONS	No	Y
7934	MILLER	CLERK	CLARK-SMIT	23-JAN-82	1300	100	ACCOUNTING	No	Y
7698	BLAKE	MANAGER	ALLEN	01-MAY-81	2850	-	SALES	No	Y

Change Toolbar

Goes in Grid Advanced → JavaScript

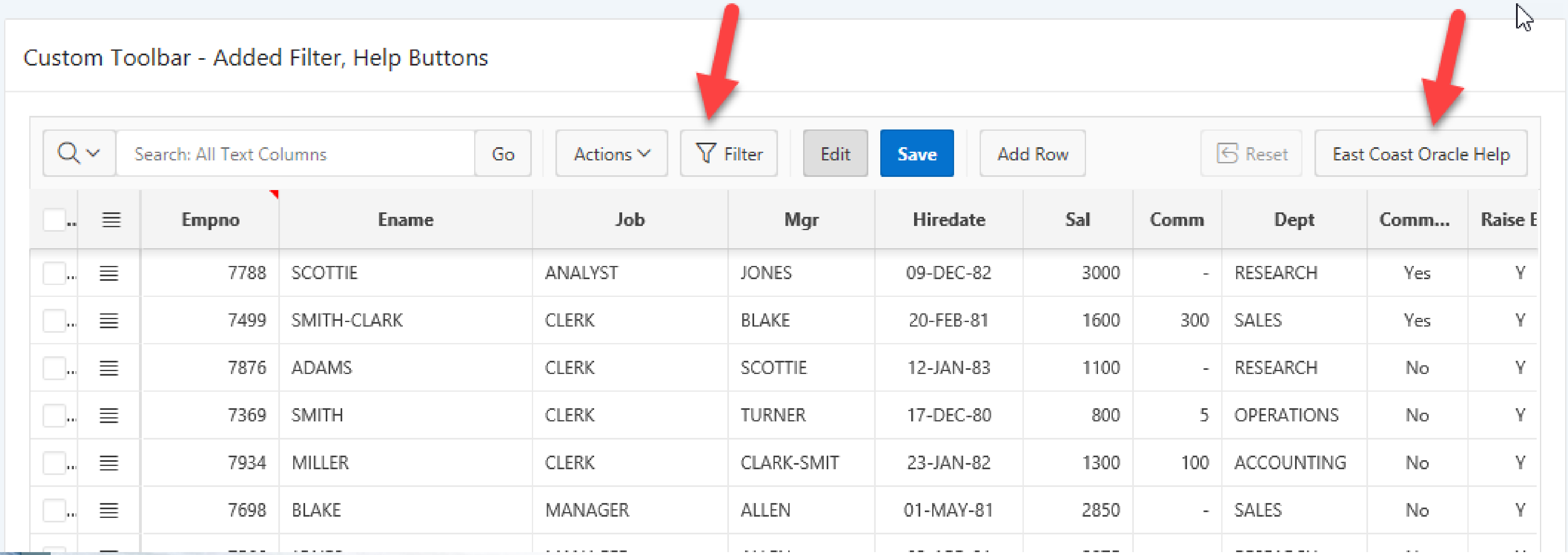


```
// toolbarFind is a new API as of 5.1.1
function(config) {
    var $ = apex.jQuery,
        toolbarData = $.apex.interactiveGrid.copyDefaultToolbar(),
         // this is the toolbar group w the Actions menu
        toolbarGroup = toolbarData.toolbarFind("actions1");

    // add a filter button after the actions menu
    toolbarGroup.controls.push( {
        type: "BUTTON",
        action: "show-filter-dialog",
        iconBeforeLabel: true
    });
    config.toolbarData = toolbarData;
    return config;
}
```



```
// Note toolbarFind - will use that a lot
function(config) {
    var $ = apex.jQuery,
        toolbarData = $.apex.interactiveGrid.copyDefaultToolbar(),
        toolbarGroup = toolbarData.toolbarFind("actions1"); // this is the group with the actions menu

    // add a filter button after the actions menu
    toolbarGroup.controls.push( {
        type: "BUTTON",
        action: "show-filter-dialog",
        iconBeforeLabel: true
    });

    toolbarGroup2 = toolbarData[toolbarData.length - 1]; // this is the last group with reset btn
    // add a button
    toolbarGroup2.controls.push( {
        type: "BUTTON",
        action: "thtech-action"
    });

    config.toolbarData = toolbarData;

    config.initActions = function( actions ) {
        // this adds our custom Help button, a simple alert but could be anything
        actions.add( {
            name: "thtech-action",
            label: "KSCOPE 2019 Help",
            action: function(event, focusElement) {
                alert("Hello KSCOPE 2019 Attendees!  You could add any existing or custom Action here, not just an alert
            }
        } );
    }
    return config;
}
```

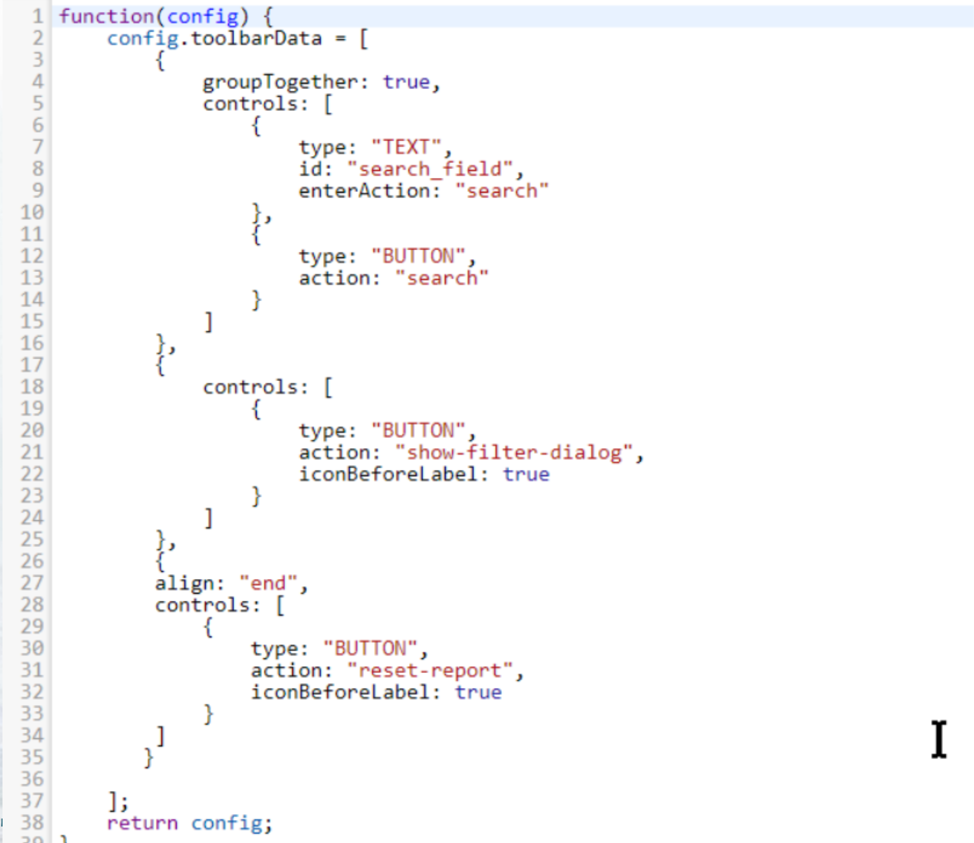
Change Toolbar



Custom Toolbar - Added Filter, Help Buttons

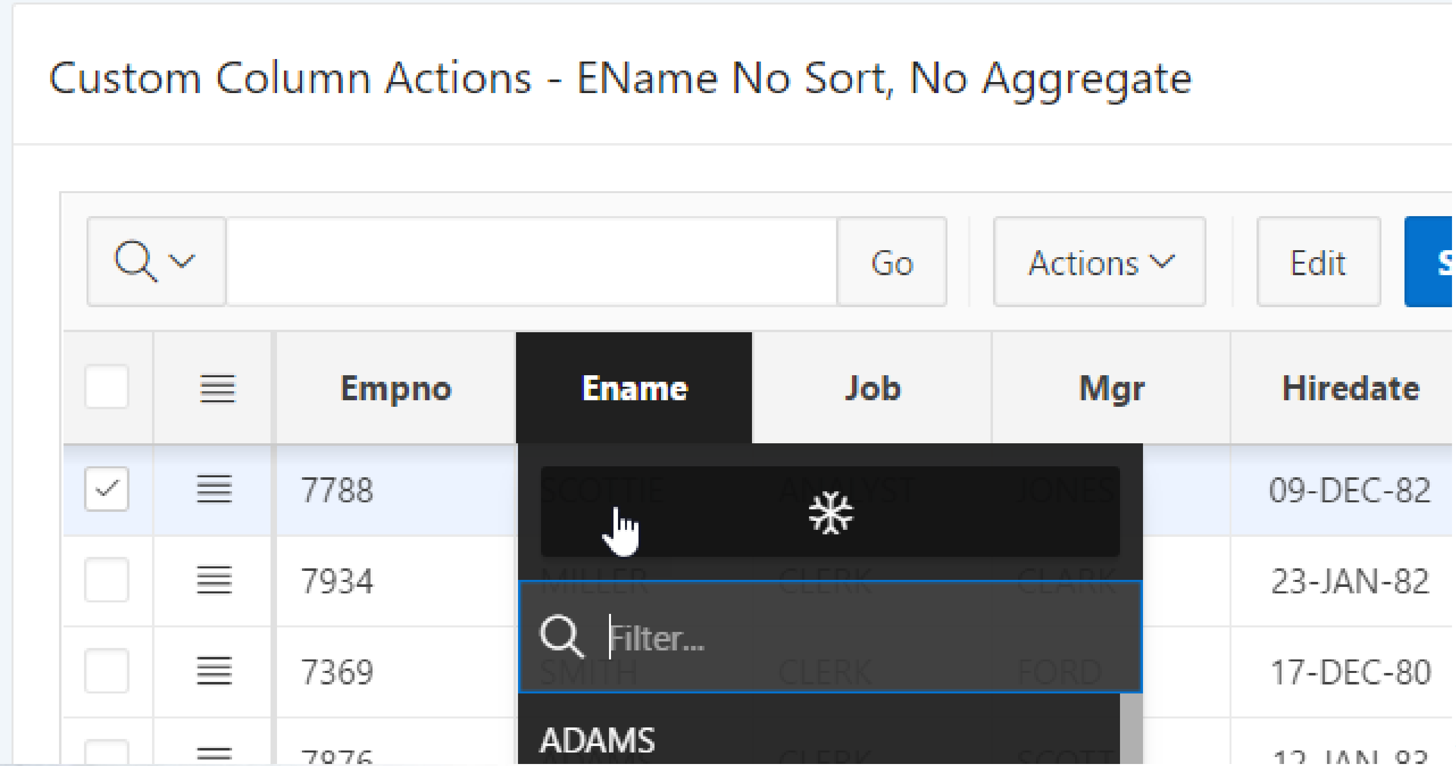
□ ..	≣	Empno	Ename	Job	Mgr	Hiredate	Sal	Comm	Dept	Comm...	Raise E
□ ..	≣	7788	SCOTTIE	ANALYST	JONES	09-DEC-82	3000	-	RESEARCH	Yes	Y
□ ..	≣	7499	SMITH-CLARK	CLERK	BLAKE	20-FEB-81	1600	300	SALES	Yes	Y
□ ..	≣	7876	ADAMS	CLERK	SCOTTIE	12-JAN-83	1100	-	RESEARCH	No	Y
□ ..	≣	7369	SMITH	CLERK	TURNER	17-DEC-80	800	5	OPERATIONS	No	Y
□ ..	≣	7934	MILLER	CLERK	CLARK-SMIT	23-JAN-82	1300	100	ACCOUNTING	No	Y
□ ..	≣	7698	BLAKE	MANAGER	ALLEN	01-MAY-81	2850	-	SALES	No	Y

Replace Toolbar Code



```
function(config) {
    config.toolbarData = [
        {
            groupTogether: true,
            controls: [
                {
                    type: "TEXT",
                    id: "search_field",
                    enterAction: "search"
                },
                {
                    type: "BUTTON",
                    action: "search"
                }
            ]
        },
        {
            controls: [
                {
                    type: "BUTTON",
                    action: "show-filter-dialog",
                    iconBeforeLabel: true
                }
            ]
        },
        {
        align: "end",
        controls: [
            {
                type: "BUTTON",
                action: "reset-report",
                iconBeforeLabel: true
            }
        ]
       }

    ];
    return config;
}
```

Change Column Heading Menu

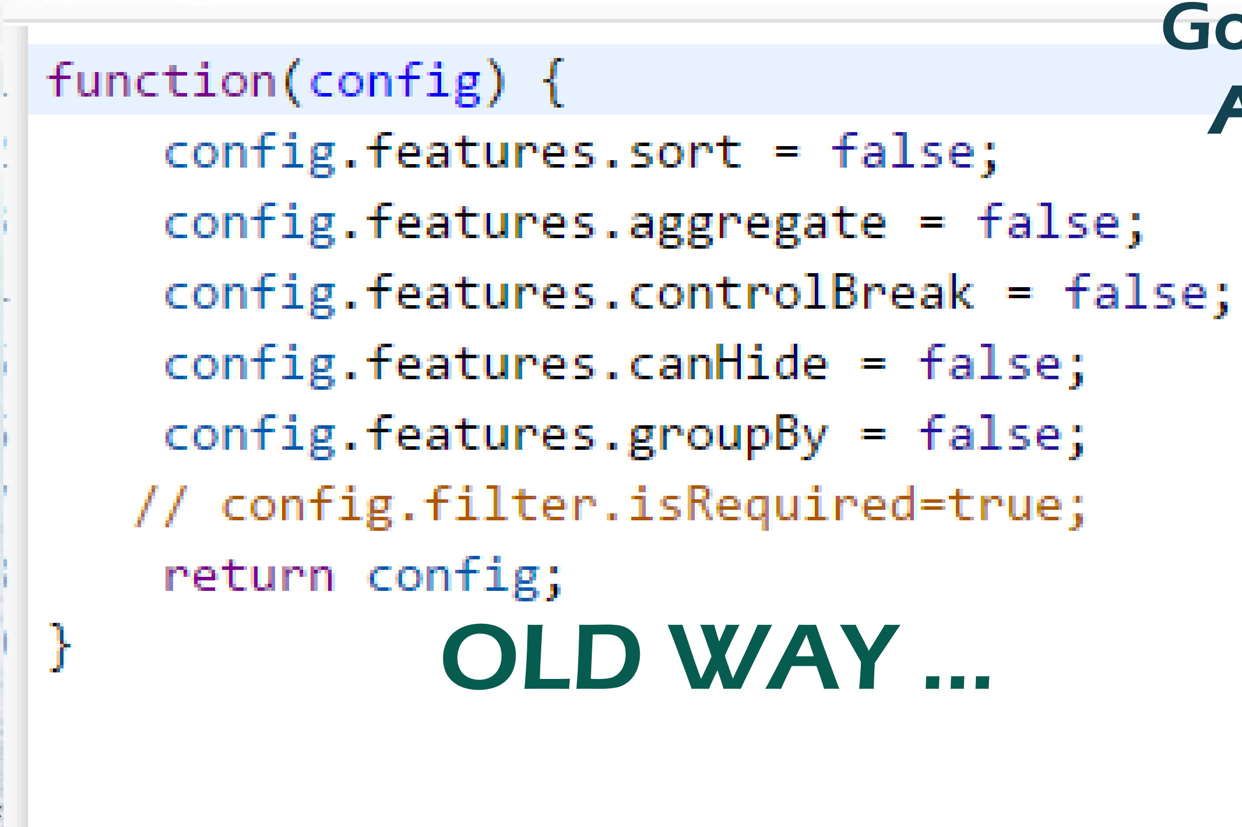


Custom Column Actions - EName No Sort, No Aggregate

□		Empno	Ename	Job	Mgr	Hiredate
☑	≡	7788				09-DEC-82
□	≡	7934				23-JAN-82
□	≡	7369				17-DEC-80
□	≡	7876				12-JAN-83

Change Column Heading Menu

Goes in Column Advanced → JavaScript

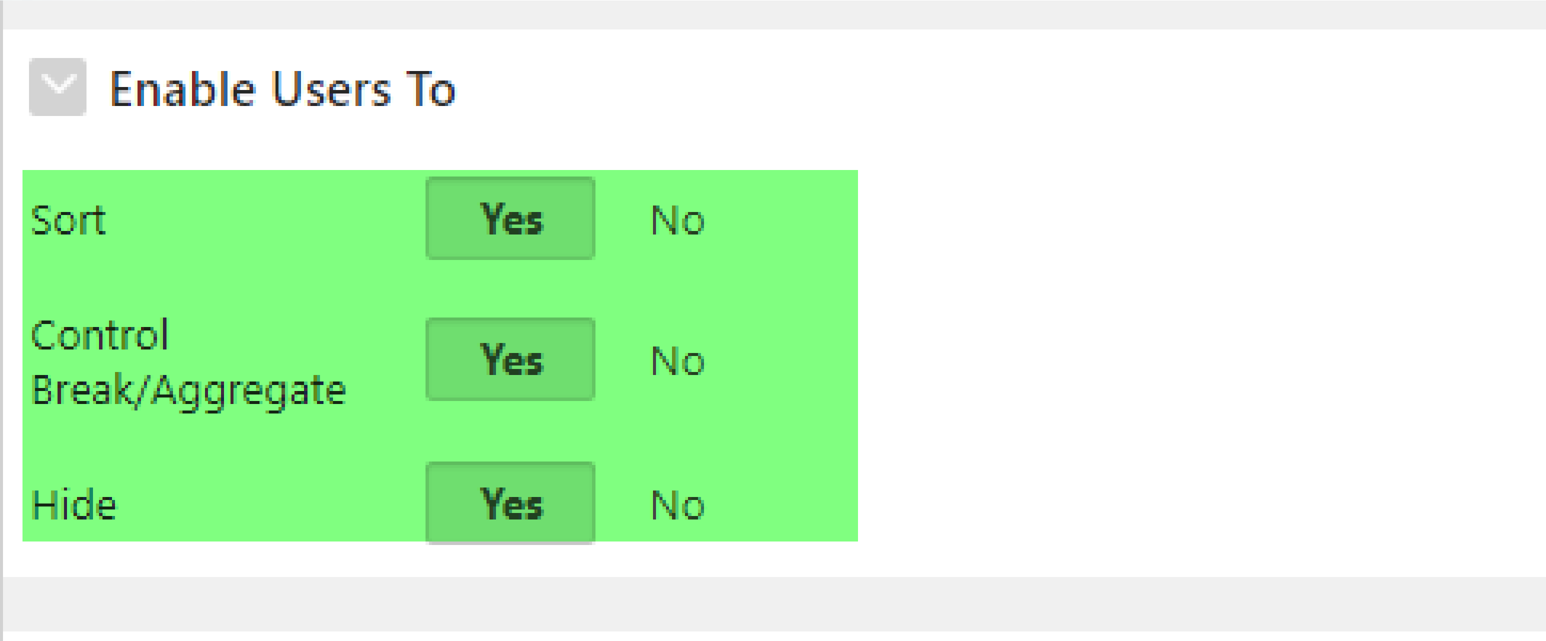


```
function(config) {
    config.features.sort = false;
    config.features.aggregate = false;
    config.features.controlBreak = false;
    config.features.canHide = false;
    config.features.groupBy = false;
  // config.filter.isRequired=true;
    return config;
}
```

OLD WAY …

Change Column Heading Menu

- Wait! Now Declarative … Mostly



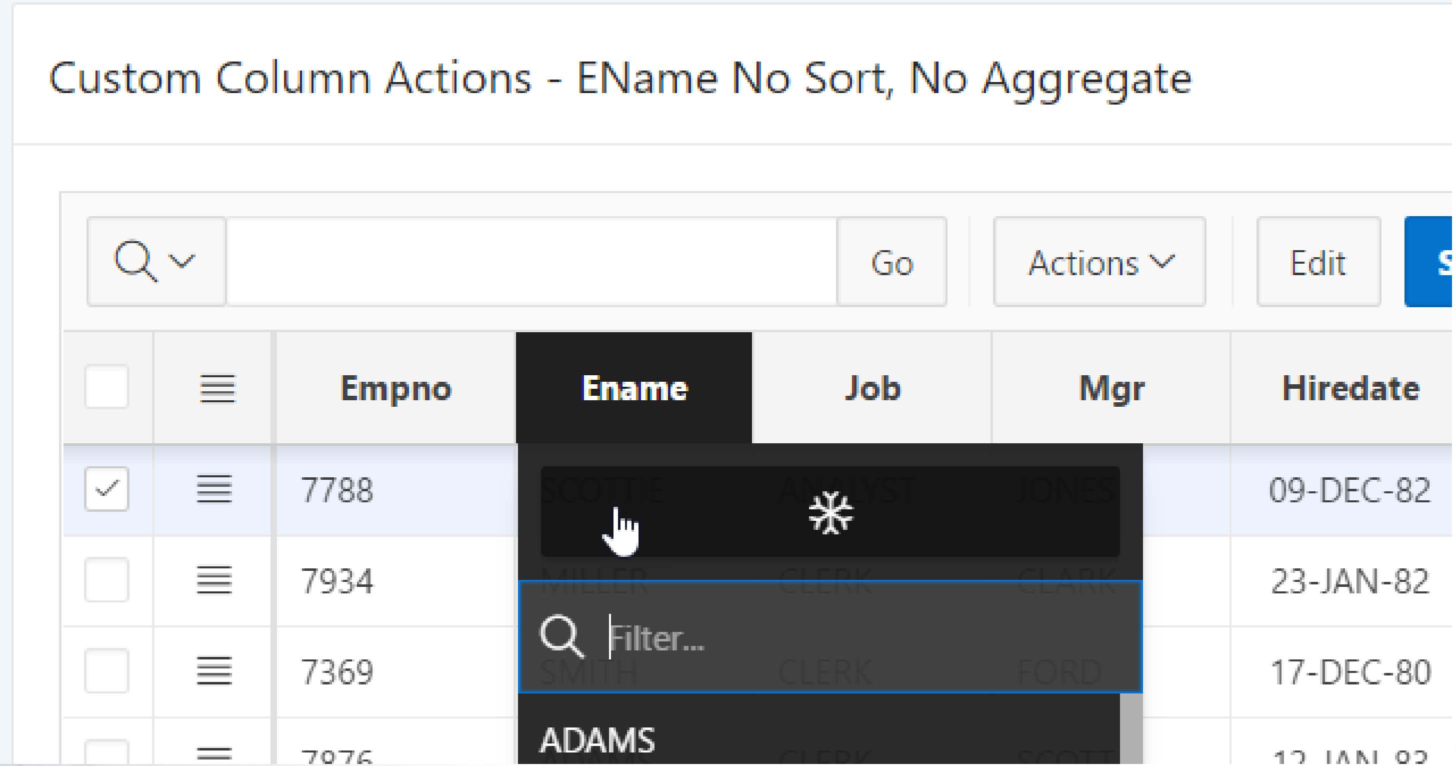
Enable Users To

Sort [✓ Yes] No

Control Break/Aggregate [✓ Yes] No

Hide [✓ Yes] No

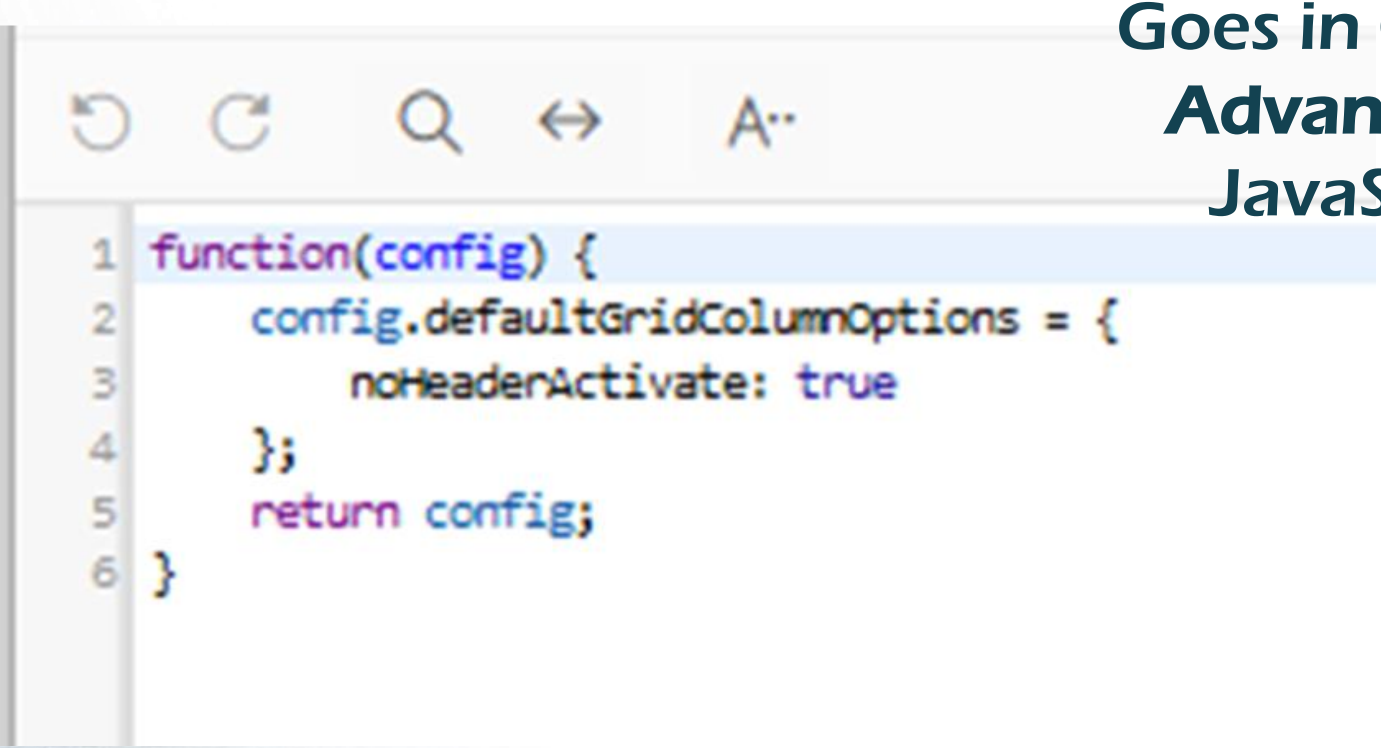
Change Column Heading Menu



Custom Column Actions - EName No Sort, No Aggregate

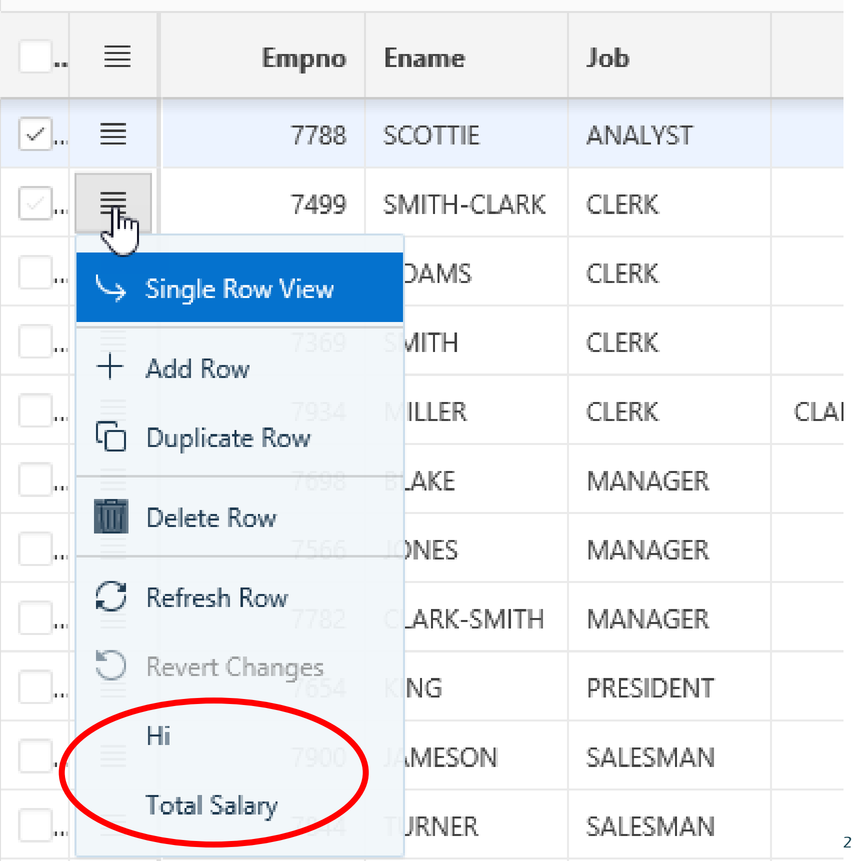
Change Column Heading Menu

Goes in Column Advanced → JavaScript



```
function(config) {
    config.defaultGridColumnOptions = {
        noHeaderActivate: true
    };
    return config;
}
```

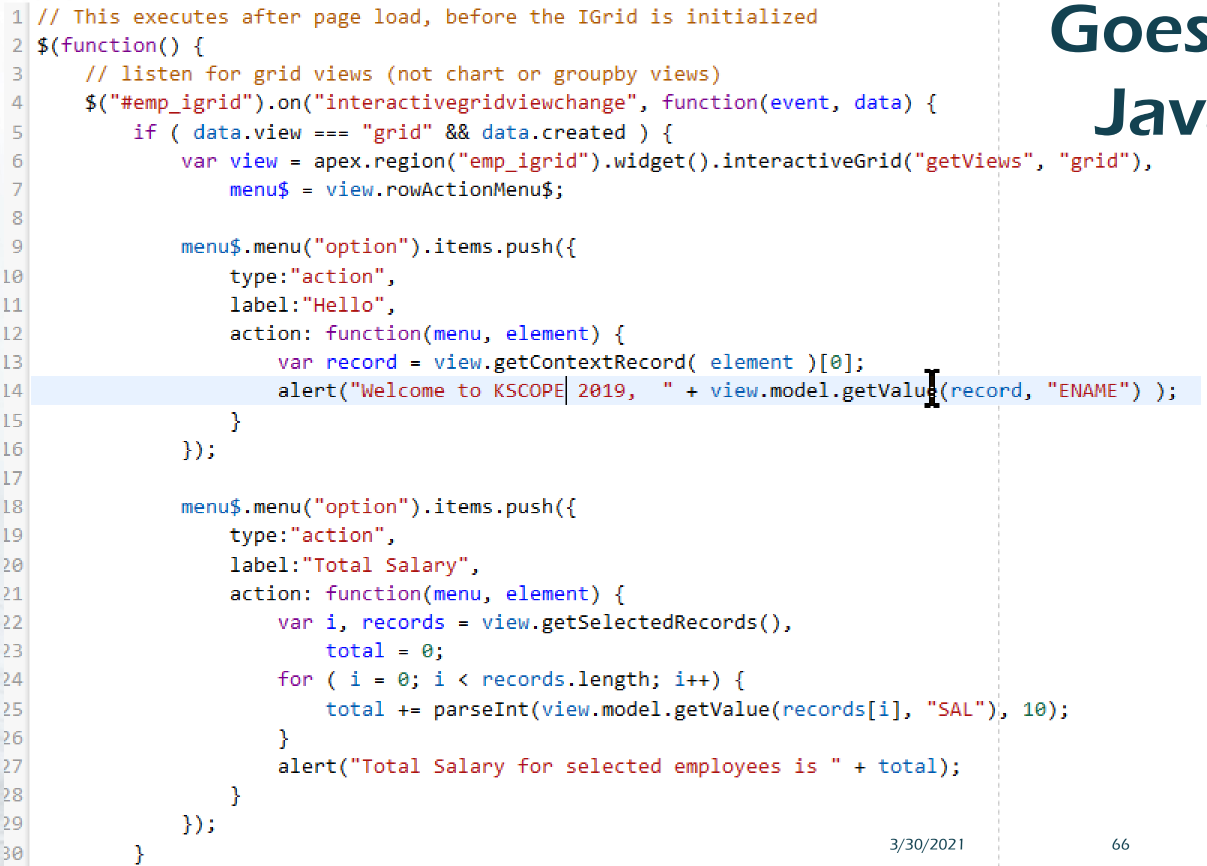
Change RowAction Menu



☐		Empno	Ename	Job	
☑		7788	SCOTTIE	ANALYST	
☐		7499	SMITH-CLARK	CLERK	
☐			DAMS	CLERK	
☐		7369	SMITH	CLERK	
☐		7934	MILLER	CLERK	CLAI
☐		7698	BLAKE	MANAGER	
☐		7566	JONES	MANAGER	
☐		7782	CLARK-SMITH	MANAGER	
☐		7654	KING	PRESIDENT	
☐		7900	JAMESON	SALESMAN	
☐		7844	TURNER	SALESMAN	

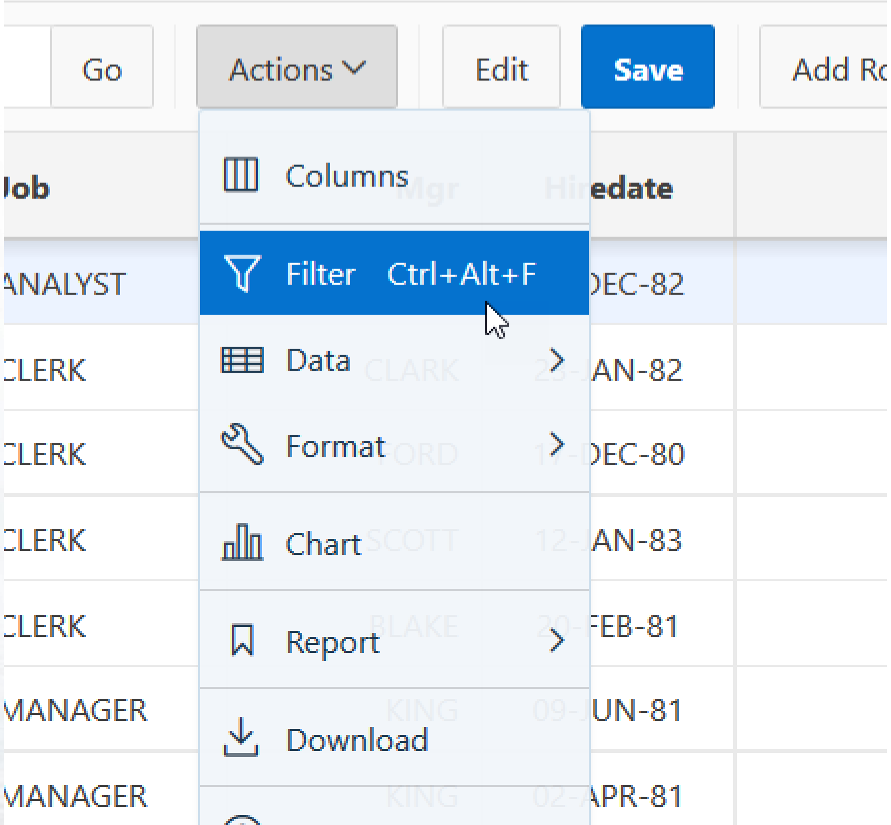
Change RowAction Menu

Goes in Page JavaScript

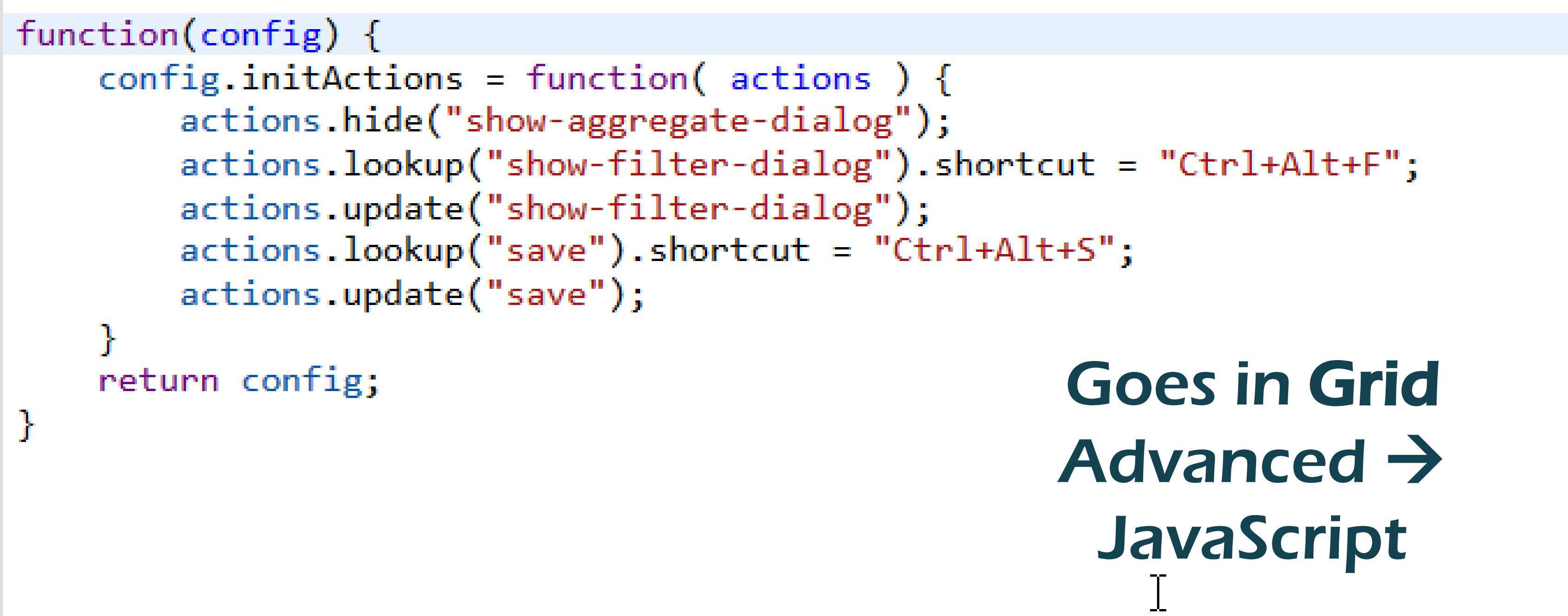


```
// This executes after page load, before the IGrid is initialized
$(function() {
    // listen for grid views (not chart or groupby views)
    $("#emp_igrid").on("interactivegridviewchange", function(event, data) {
        if ( data.view === "grid" && data.created ) {
            var view = apex.region("emp_igrid").widget().interactiveGrid("getViews", "grid"),
                menu$ = view.rowActionMenu$;

            menu$.menu("option").items.push({
                type:"action",
                label:"Hello",
                action: function(menu, element) {
                    var record = view.getContextRecord( element )[0];
                    alert("Welcome to KSCOPE 2019,  " + view.model.getValue(record, "ENAME") );
                }
            });

            menu$.menu("option").items.push({
                type:"action",
                label:"Total Salary",
                action: function(menu, element) {
                    var i, records = view.getSelectedRecords(),
                        total = 0;
                    for ( i = 0; i < records.length; i++) {
                        total += parseInt(view.model.getValue(records[i], "SAL"), 10);
                    }
                    alert("Total Salary for selected employees is " + total);
                }
            });
        }
```

Change Toolbar Actions Menu



Change Toolbar Actions Menu



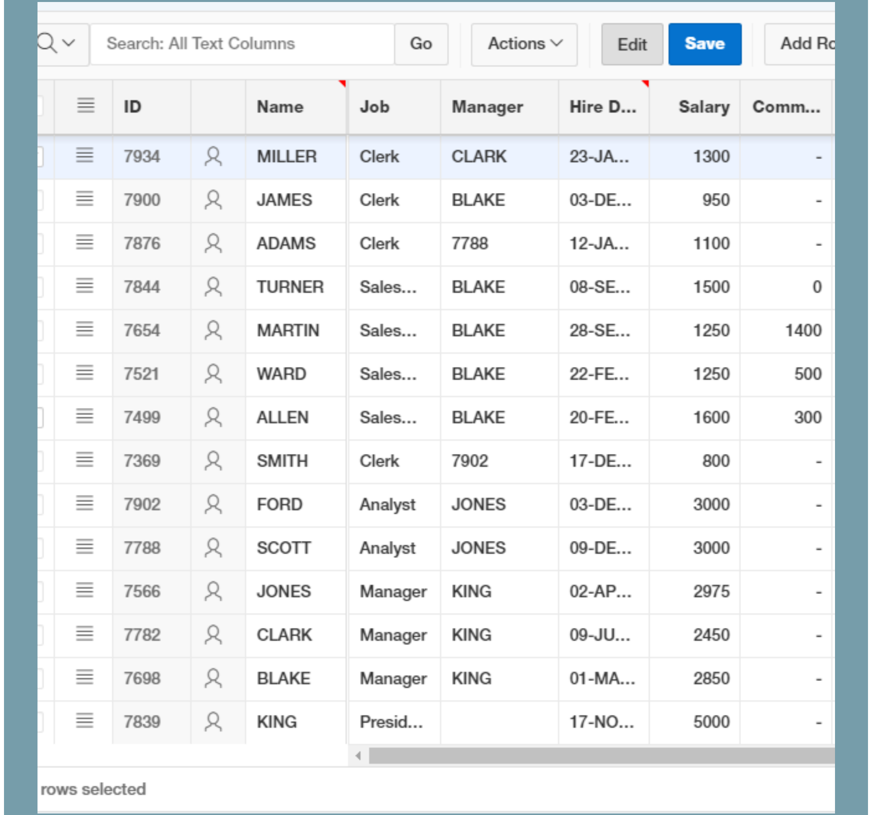
```
function(config) {
    config.initActions = function( actions ) {
        actions.hide("show-aggregate-dialog");
        actions.lookup("show-filter-dialog").shortcut = "Ctrl+Alt+F";
        actions.update("show-filter-dialog");
        actions.lookup("save").shortcut = "Ctrl+Alt+S";
        actions.update("save");
    }
    return config;
}
```

Goes in Grid Advanced → JavaScript

APEX Interactive Grid:

Standardize

Customizations Across Applications

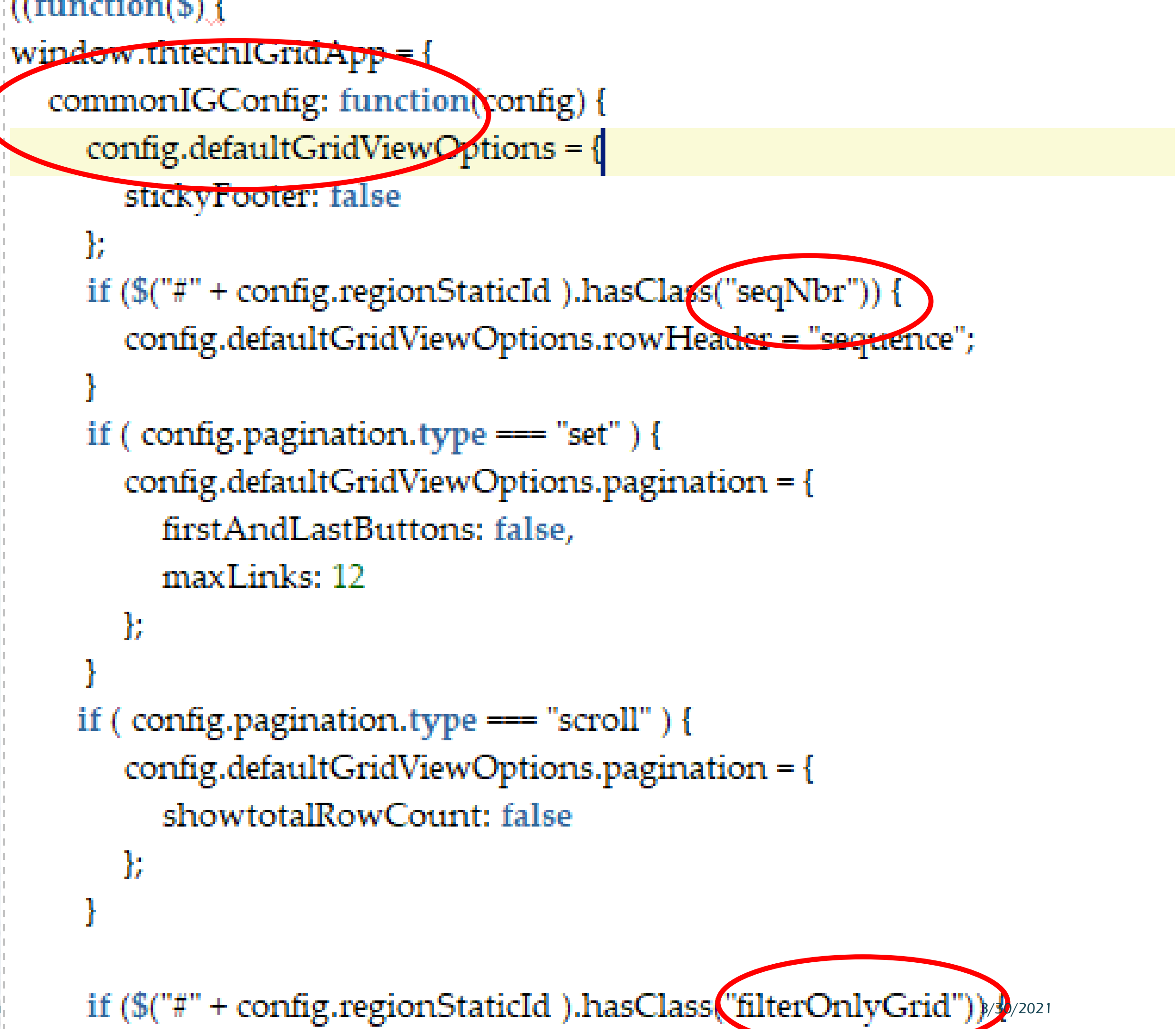


≡	ID		Name	Job	Manager	Hire D...	Salary	Comm...
≡	7934	👤	MILLER	Clerk	CLARK	23-JA...	1300	-
≡	7900	👤	JAMES	Clerk	BLAKE	03-DE...	950	-
≡	7876	👤	ADAMS	Clerk	7788	12-JA...	1100	-
≡	7844	👤	TURNER	Sales...	BLAKE	08-SE...	1500	0
≡	7654	👤	MARTIN	Sales...	BLAKE	28-SE...	1250	1400
≡	7521	👤	WARD	Sales...	BLAKE	22-FE...	1250	500
≡	7499	👤	ALLEN	Sales...	BLAKE	20-FE...	1600	300
≡	7369	👤	SMITH	Clerk	7902	17-DE...	800	-
≡	7902	👤	FORD	Analyst	JONES	03-DE...	3000	-
≡	7788	👤	SCOTT	Analyst	JONES	09-DE...	3000	-
≡	7566	👤	JONES	Manager	KING	02-AP...	2975	-
≡	7782	👤	CLARK	Manager	KING	09-JU...	2450	-
≡	7698	👤	BLAKE	Manager	KING	01-MA...	2850	-
≡	7839	👤	KING	Presid...		17-NO...	5000	-

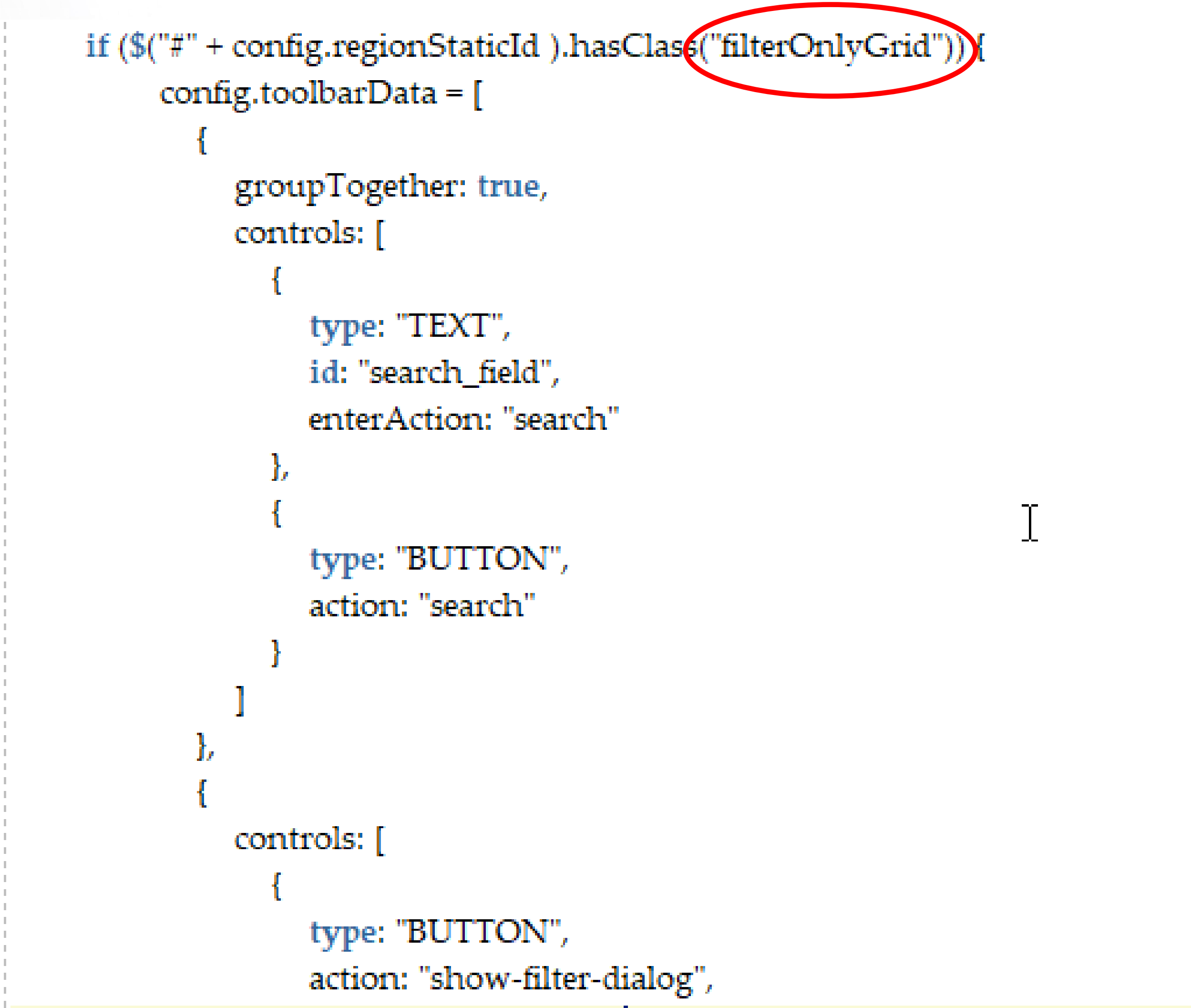
rows selected

Standardize via "Global" Settings

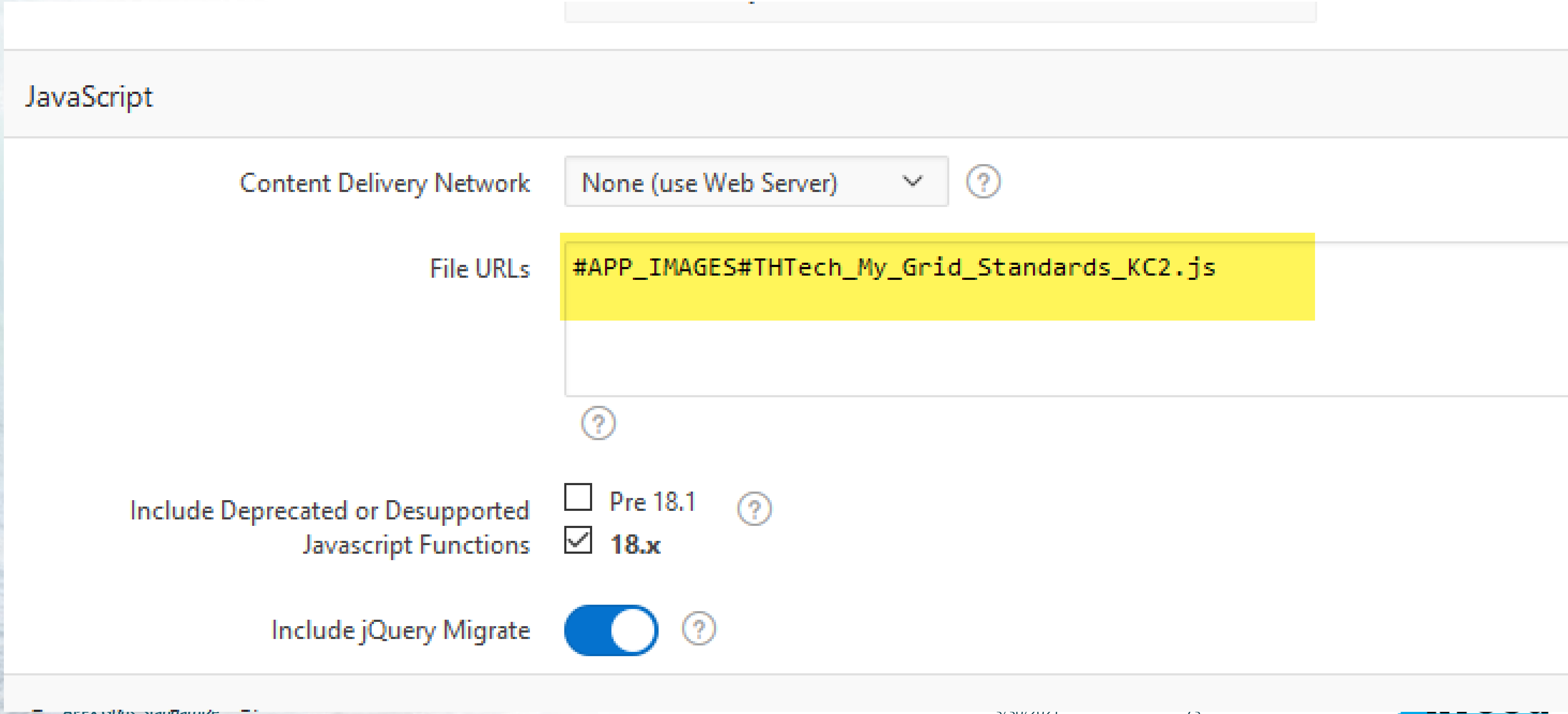
- JS Function in JS File
- Include File
- Reference JS Function in Advanced → JavaScript Code
- Add Classes on Grids



```
((function($) {
window.thtechIGridApp = {
    commonIGConfig: function(config) {
        config.defaultGridViewOptions = {
            stickyFooter: false
        };
        if ($("#" + config.regionStaticId ).hasClass("seqNbr")) {
            config.defaultGridViewOptions.rowHeader = "sequence";
        }
        if ( config.pagination.type === "set" ) {
            config.defaultGridViewOptions.pagination = {
                firstAndLastButtons: false,
                maxLinks: 12
            };
        }
        if ( config.pagination.type === "scroll" ) {
            config.defaultGridViewOptions.pagination = {
                showtotalRowCount: false
            };
        }

        if ($("#" + config.regionStaticId ).hasClass("filterOnlyGrid")) {
```



```
if ($("#" + config.regionStaticId ).hasClass("filterOnlyGrid")){
    config.toolbarData = [
        {
            groupTogether: true,
            controls: [
                {
                    type: "TEXT",
                    id: "search_field",
                    enterAction: "search"
                },
                {
                    type: "BUTTON",
                    action: "search"
                }
            ]
        },
        {
            controls: [
                {
                    type: "BUTTON",
                    action: "show-filter-dialog",
```



JavaScript

Content Delivery Network: None (use Web Server)

File URLs:

```
#APP_IMAGES#THTech_My_Grid_Standards_KC2.js
```

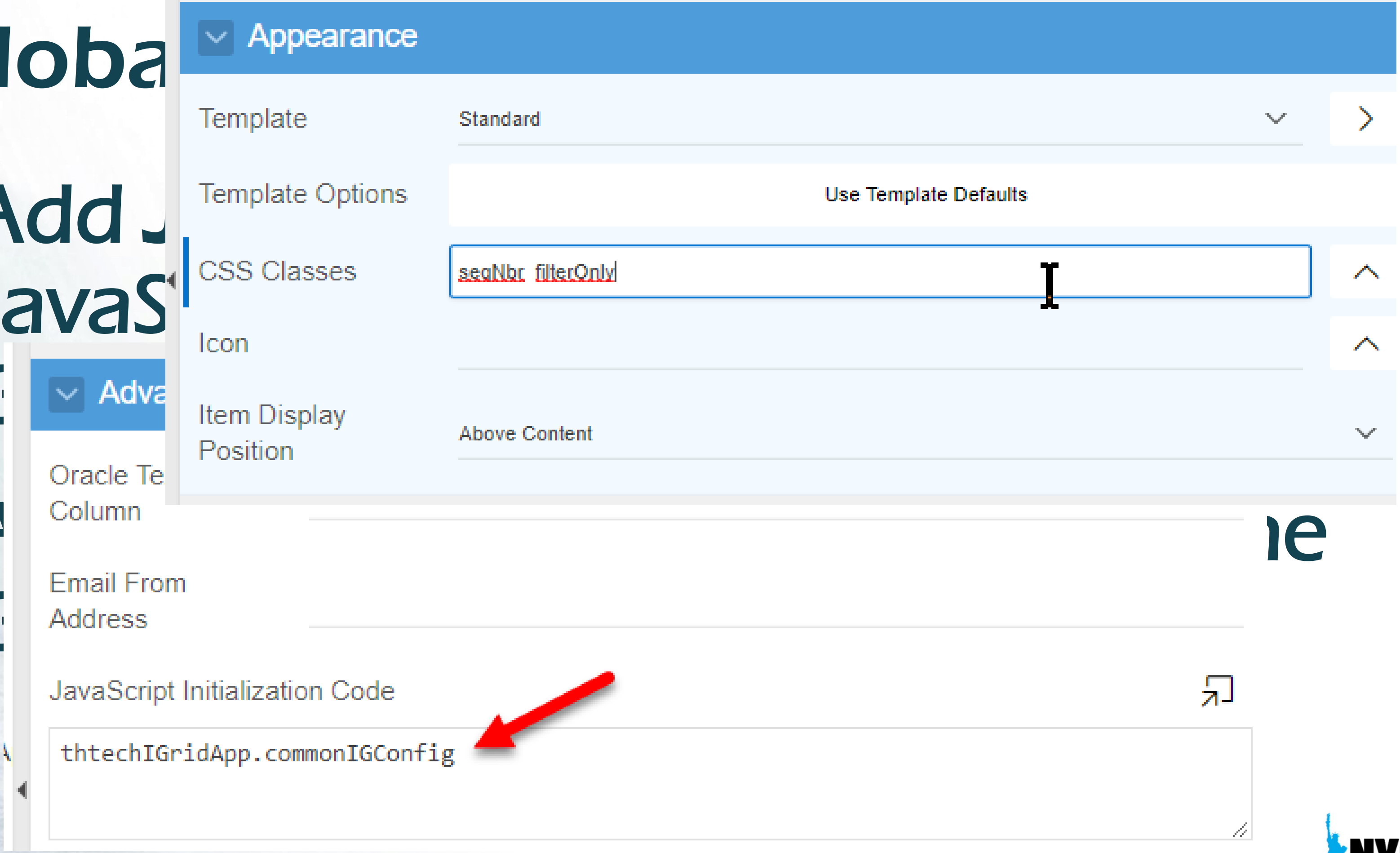
Include Deprecated or Desupported Javascript Functions: □ Pre 18.1 ☑ 18.x

Include jQuery Migrate: ●

Globa

- Add J
JavaS
G

- A ne
G



Appearance

Template: Standard

Template Options: Use Template Defaults

CSS Classes: seqNbr filterOnly

Icon

Item Display Position: Above Content

Adva

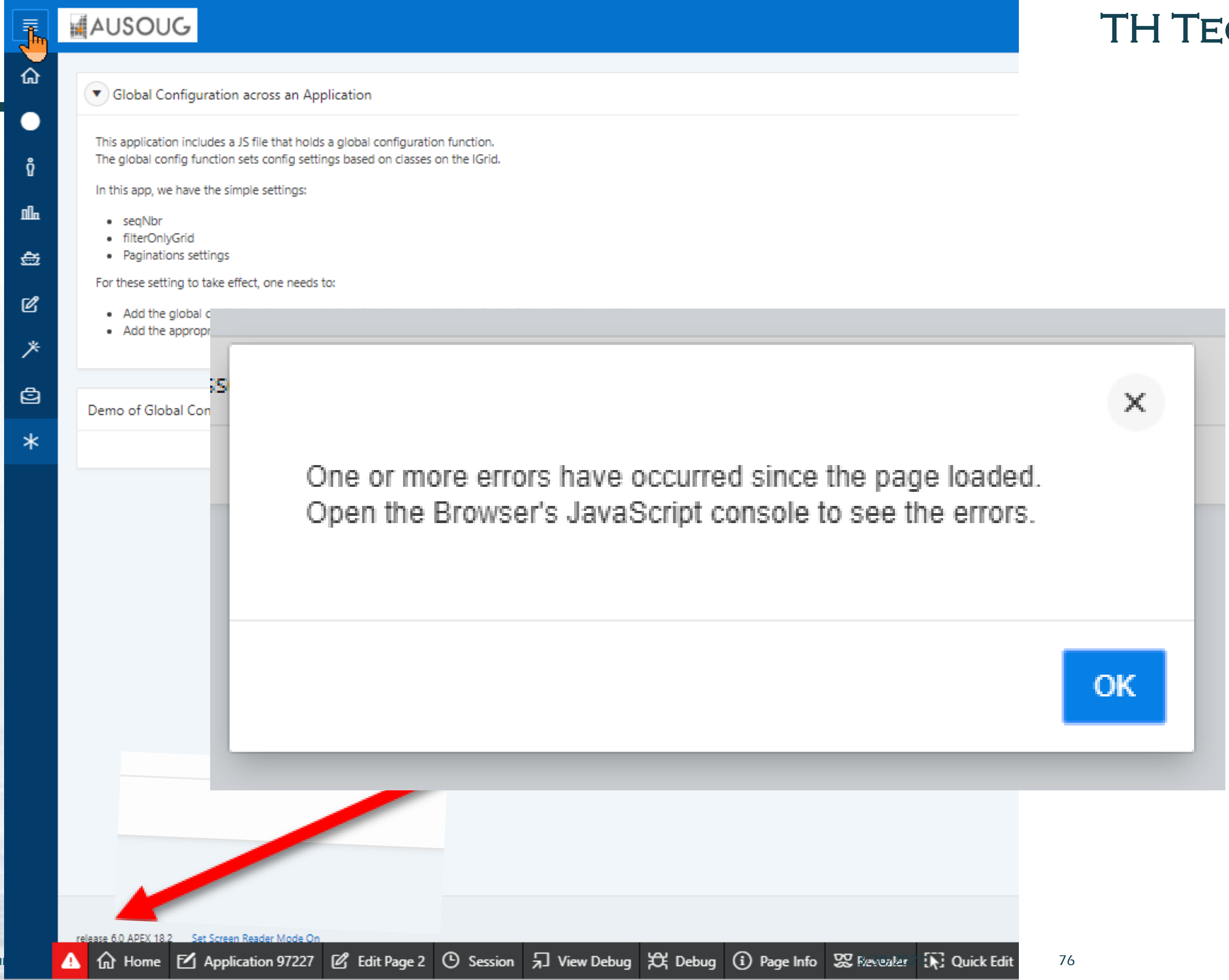
Oracle Te Column

Email From Address

JavaScript Initialization Code

```
thtechIGridApp.commonIGConfig
```

If T



Global Configuration across an Application

This application includes a JS file that holds a global configuration function.
The global config function sets config settings based on classes on the IGrid.

In this app, we have the simple settings:

- seqNbr
- filterOnlyGrid
- Paginations settings

For these setting to take effect, one needs to:

- Add the global c
- Add the appropr

Demo of Global Con

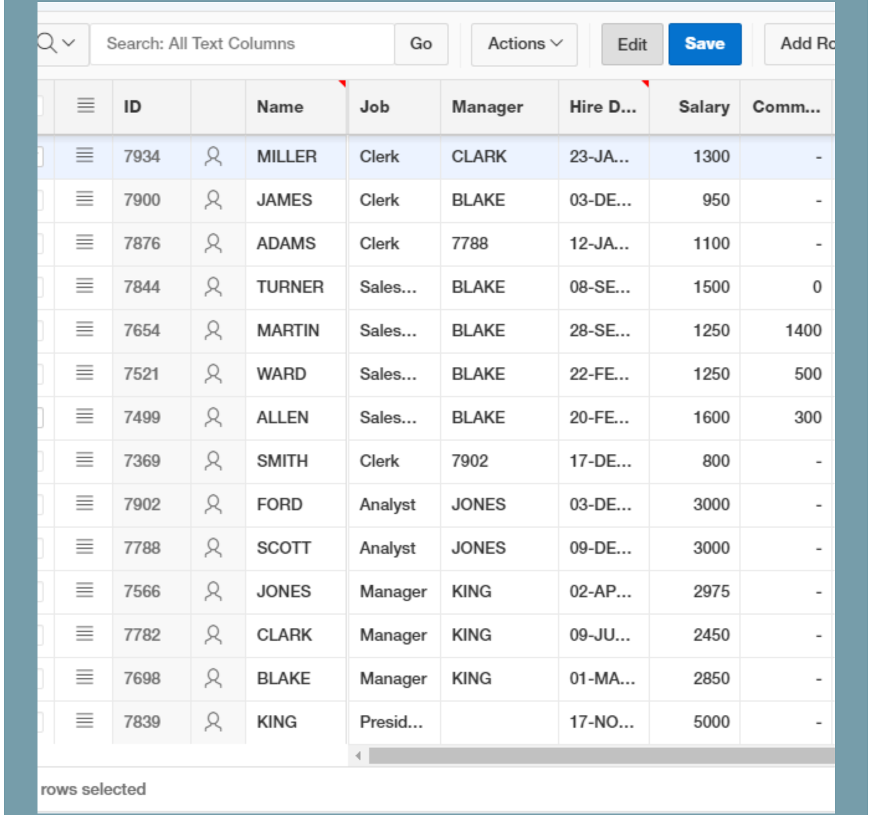
One or more errors have occurred since the page loaded.
Open the Browser's JavaScript console to see the errors.

release 6.0 APEX 18.2 Set Screen Reader Mode On

APEX Interactive Grids: Standardize

Best Practices

Recommendations for Adding JavaScript to APEX Applications



≡	ID	Name	Job	Manager	Hire D...	Salary	Comm...
≡	7934	MILLER	Clerk	CLARK	23-JA...	1300	-
≡	7900	JAMES	Clerk	BLAKE	03-DE...	950	-
≡	7876	ADAMS	Clerk	7788	12-JA...	1100	-
≡	7844	TURNER	Sales...	BLAKE	08-SE...	1500	0
≡	7654	MARTIN	Sales...	BLAKE	28-SE...	1250	1400
≡	7521	WARD	Sales...	BLAKE	22-FE...	1250	500
≡	7499	ALLEN	Sales...	BLAKE	20-FE...	1600	300
≡	7369	SMITH	Clerk	7902	17-DE...	800	-
≡	7902	FORD	Analyst	JONES	03-DE...	3000	-
≡	7788	SCOTT	Analyst	JONES	09-DE...	3000	-
≡	7566	JONES	Manager	KING	02-AP...	2975	-
≡	7782	CLARK	Manager	KING	09-JU...	2450	-
≡	7698	BLAKE	Manager	KING	01-MA...	2850	-
≡	7839	KING	Presid...		17-NO...	5000	-

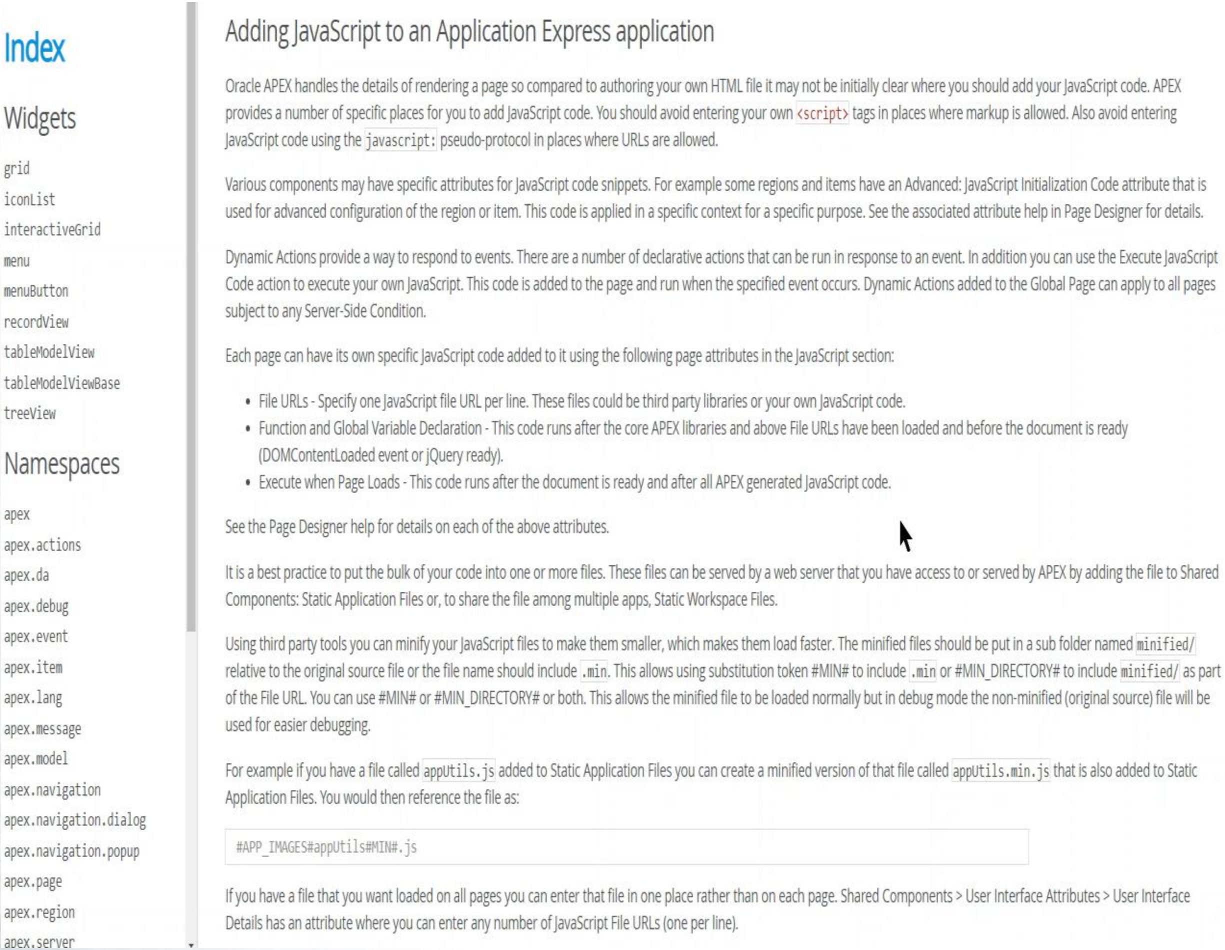
Adding JS to APEX

Follow the Usual Best Practices:

- Put Bulk of Code in JS Files
- Minify
- Read More in the Introduction to the JS API doc:

Adding JavaScript to an Application Express application

https://docs.oracle.com/en/database/oracle/application-express/19.1/aexjs/index.html



Index

Widgets

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apex.event
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apex.model
apex.navigation
apex.navigation.dialog
apex.navigation.popup
apex.page
apex.region
apex.server

Adding JavaScript to an Application Express application

Oracle APEX handles the details of rendering a page so compared to authoring your own HTML file it may not be initially clear where you should add your JavaScript code. APEX provides a number of specific places for you to add JavaScript code. You should avoid entering your own `<script>` tags in places where markup is allowed. Also avoid entering JavaScript code using the `javascript:` pseudo-protocol in places where URLs are allowed.

Various components may have specific attributes for JavaScript code snippets. For example some regions and items have an Advanced: JavaScript Initialization Code attribute that is used for advanced configuration of the region or item. This code is applied in a specific context for a specific purpose. See the associated attribute help in Page Designer for details.

Dynamic Actions provide a way to respond to events. There are a number of declarative actions that can be run in response to an event. In addition you can use the Execute JavaScript Code action to execute your own JavaScript. This code is added to the page and run when the specified event occurs. Dynamic Actions added to the Global Page can apply to all pages subject to any Server-Side Condition.

Each page can have its own specific JavaScript code added to it using the following page attributes in the JavaScript section:

- File URLs - Specify one JavaScript file URL per line. These files could be third party libraries or your own JavaScript code.
- Function and Global Variable Declaration - This code runs after the core APEX libraries and above File URLs have been loaded and before the document is ready (DOMContentLoaded event or jQuery ready).
- Execute when Page Loads - This code runs after the document is ready and after all APEX generated JavaScript code.

See the Page Designer help for details on each of the above attributes.

It is a best practice to put the bulk of your code into one or more files. These files can be served by a web server that you have access to or served by APEX by adding the file to Shared Components: Static Application Files or, to share the file among multiple apps, Static Workspace Files.

Using third party tools you can minify your JavaScript files to make them smaller, which makes them load faster. The minified files should be put in a sub folder named `minified/` relative to the original source file or the file name should include `.min`. This allows using substitution token #MIN# to include `.min` or #MIN_DIRECTORY# to include `minified/` as part of the File URL. You can use #MIN# or #MIN_DIRECTORY# or both. This allows the minified file to be loaded normally but in debug mode the non-minified (original source) file will be used for easier debugging.

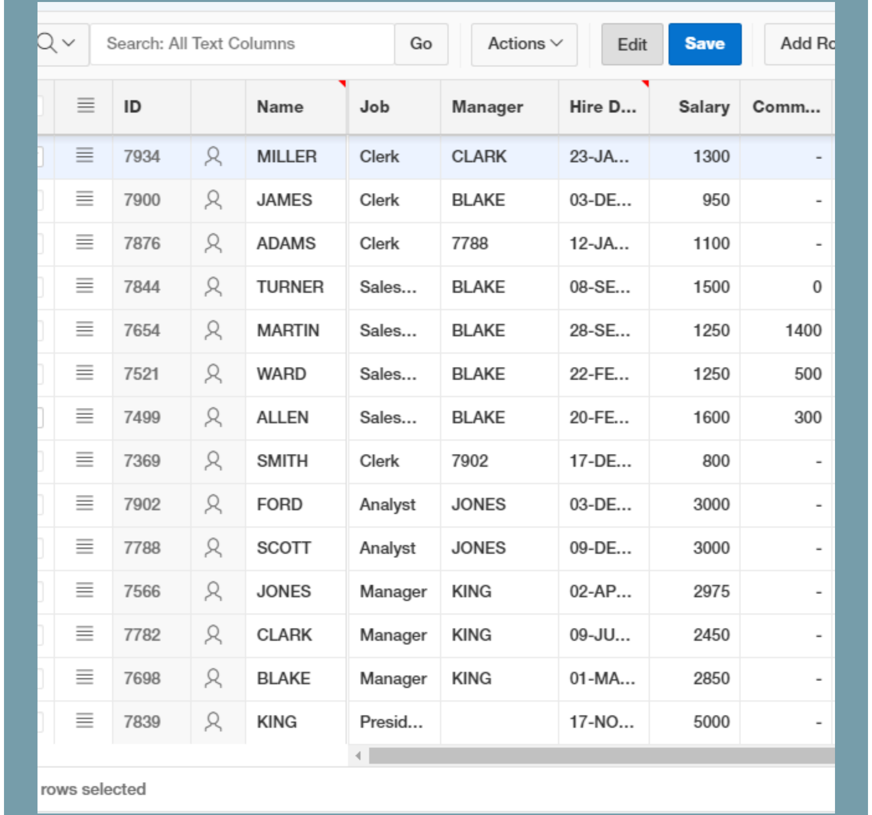
For example if you have a file called `appUtils.js` added to Static Application Files you can create a minified version of that file called `appUtils.min.js` that is also added to Static Application Files. You would then reference the file as:

```
#APP_IMAGES#appUtils#MIN#.js
```

If you have a file that you want loaded on all pages you can enter that file in one place rather than on each page. Shared Components > User Interface Attributes > User Interface Details has an attribute where you can enter any number of JavaScript File URLs (one per line).

APEX Interactive Grids: Standardize

Wrapup



	ID		Name	Job	Manager	Hire D...	Salary	Comm...
≡	7934	👤	MILLER	Clerk	CLARK	23-JA...	1300	-
≡	7900	👤	JAMES	Clerk	BLAKE	03-DE...	950	-
≡	7876	👤	ADAMS	Clerk	7788	12-JA...	1100	-
≡	7844	👤	TURNER	Sales...	BLAKE	08-SE...	1500	0
≡	7654	👤	MARTIN	Sales...	BLAKE	28-SE...	1250	1400
≡	7521	👤	WARD	Sales...	BLAKE	22-FE...	1250	500
≡	7499	👤	ALLEN	Sales...	BLAKE	20-FE...	1600	300
≡	7369	👤	SMITH	Clerk	7902	17-DE...	800	-
≡	7902	👤	FORD	Analyst	JONES	03-DE...	3000	-
≡	7788	👤	SCOTT	Analyst	JONES	09-DE...	3000	-
≡	7566	👤	JONES	Manager	KING	02-AP...	2975	-
≡	7782	👤	CLARK	Manager	KING	09-JU...	2450	-
≡	7698	👤	BLAKE	Manager	KING	01-MA...	2850	-
≡	7839	👤	KING	Presid...		17-NO...	5000	-

rows selected

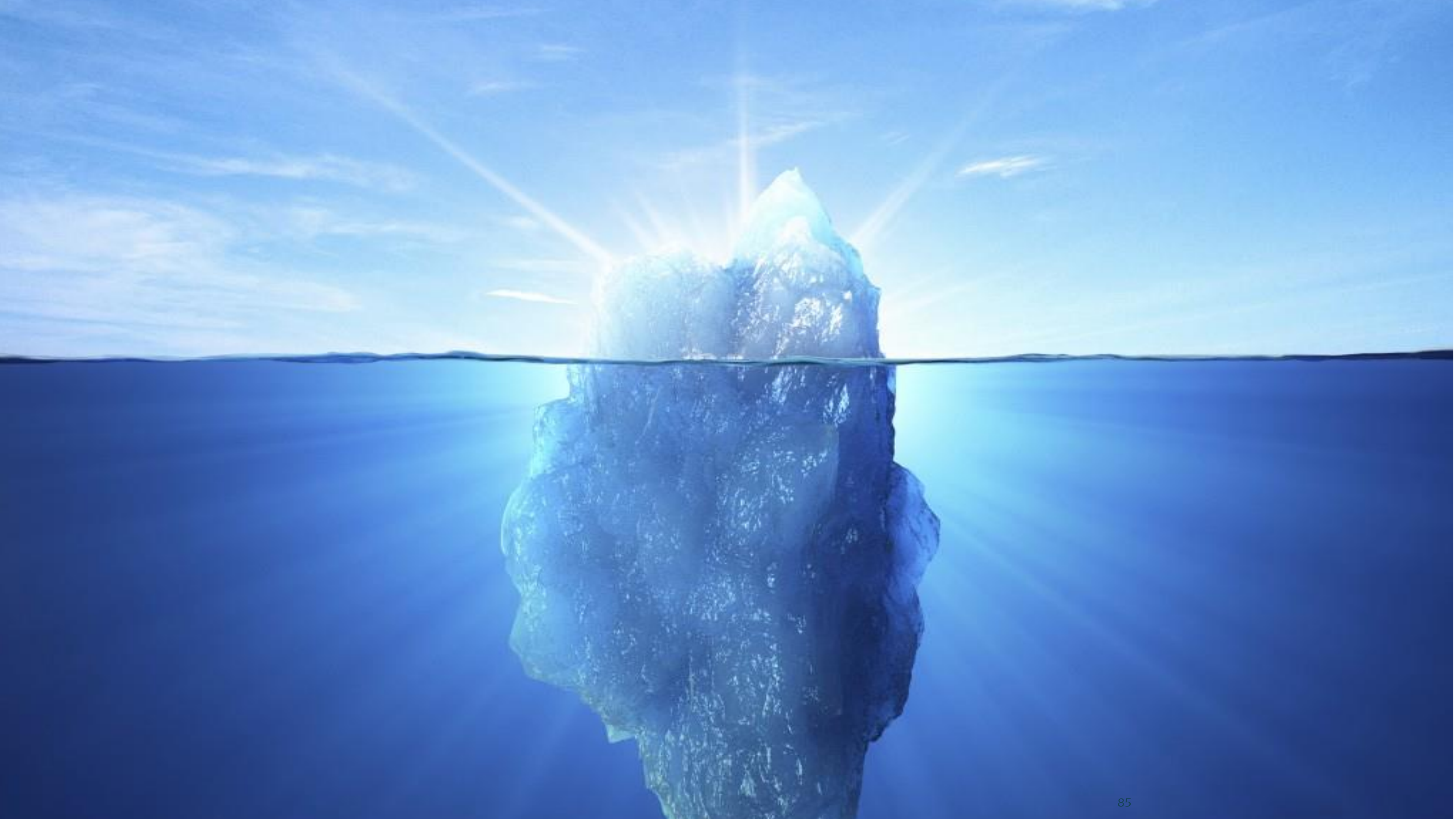
Standardize Your Grids

- Have Standards
- Apply Common Settings, Configurations
- Use Copy/Duplicate and/or Plugins
- Use a Standard Global Configuration File, Function and Classes

Stay Sane,

Keep Your Users Happy …

MARIO BADESCU



Challenge Homework

- Sample Interactive Grid App
- IG Cookbook

  http://www.hardlikesoftware.com
- Read the APIs (coffee!!)
- Read the JS Widget Code

  <apex_install_dir>/images/libraries/apex

PLAY

Questions?
Thank You

Email for Demo App, Slides

Karen Cannell
kcannell@thtechnology.com
@thtechnology

Resources

- APEX JavaScript Reference

  https://apexoracle.com/jsapi
- Sample Interactive Grids

  APEX 19.1+ Sample Application, Editing section
- Interactive Grid Cookbook, 19.1 and all versions

  http://hardlikesoftware.com/weblog/2019/03/30/apex-ig-cookbook-update-for-19-1/
- Architecture: Interactive Grids Under the Hood

  http://hardlikesoftware.com/weblog/2016/06/08/interactive-grid-under-the-hood/
- More on Grids: How to Hack Interactive Grids, Parts I thru IV
  http://hardlikesoftware.com/weblog/2017/01/18/how-to-hack-apex-interactive-grid-part-1/

Resources, cont'd

- APEX Client-Side Validation
  http://hardlikesoftware.com/weblog/2017/05/10/apex-client-side-validation/#more-615
- Interactive Grid Extend Toolbar Plugin
  https://github.com/mgoricki/apex-plugin-extend-ig-toolbar

Shortcut to APEX JavaScript APIs:

apex.oracle.com/jsapi

Where to Put JS Files

- https://www.talkapex.com/2017/01/how-to-reference-javsscript-and-css-files-for-entire-application/js-storage.gif