

oh hai!

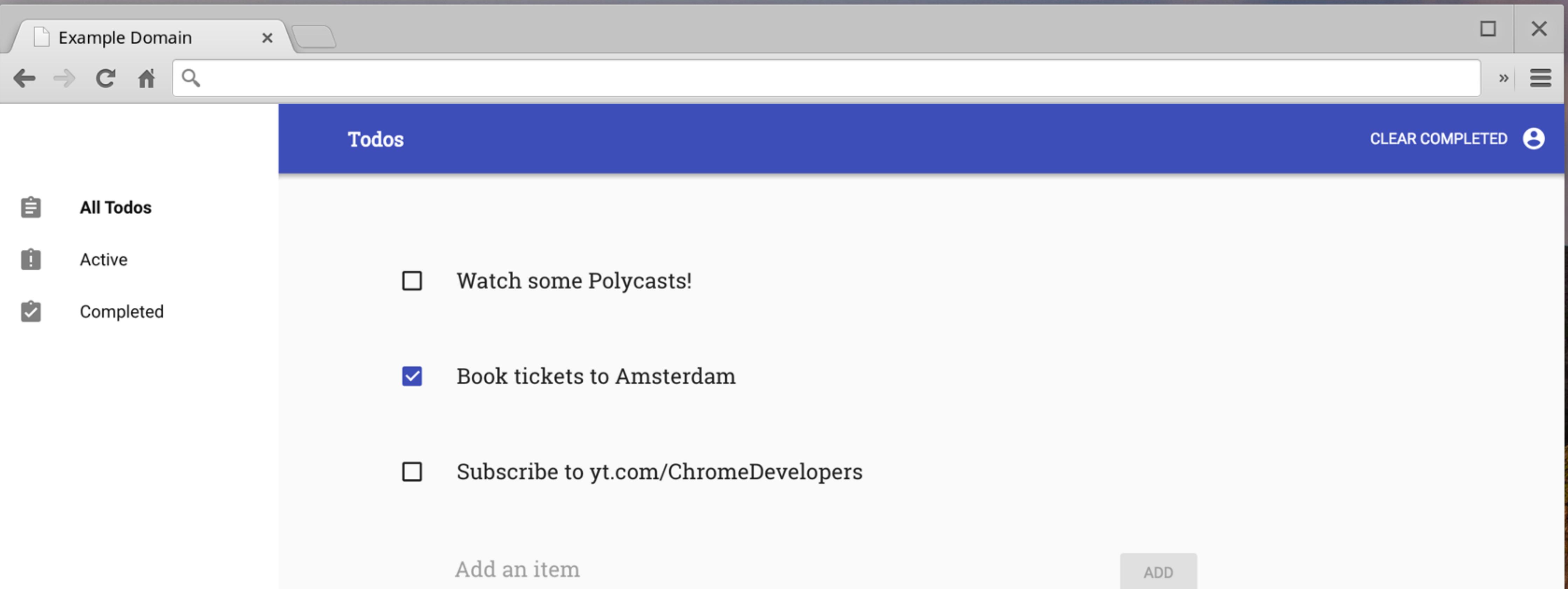


uber nerd

@rob_dodson
+RobDodson

end to end
WITH
Polymer





Example Domain

Todos

CLEAR COMPLETED

All Todos

Active

Completed

Watch some Polycasts!

Book tickets to Amsterdam

Subscribe to yt.com/ChromeDevelopers

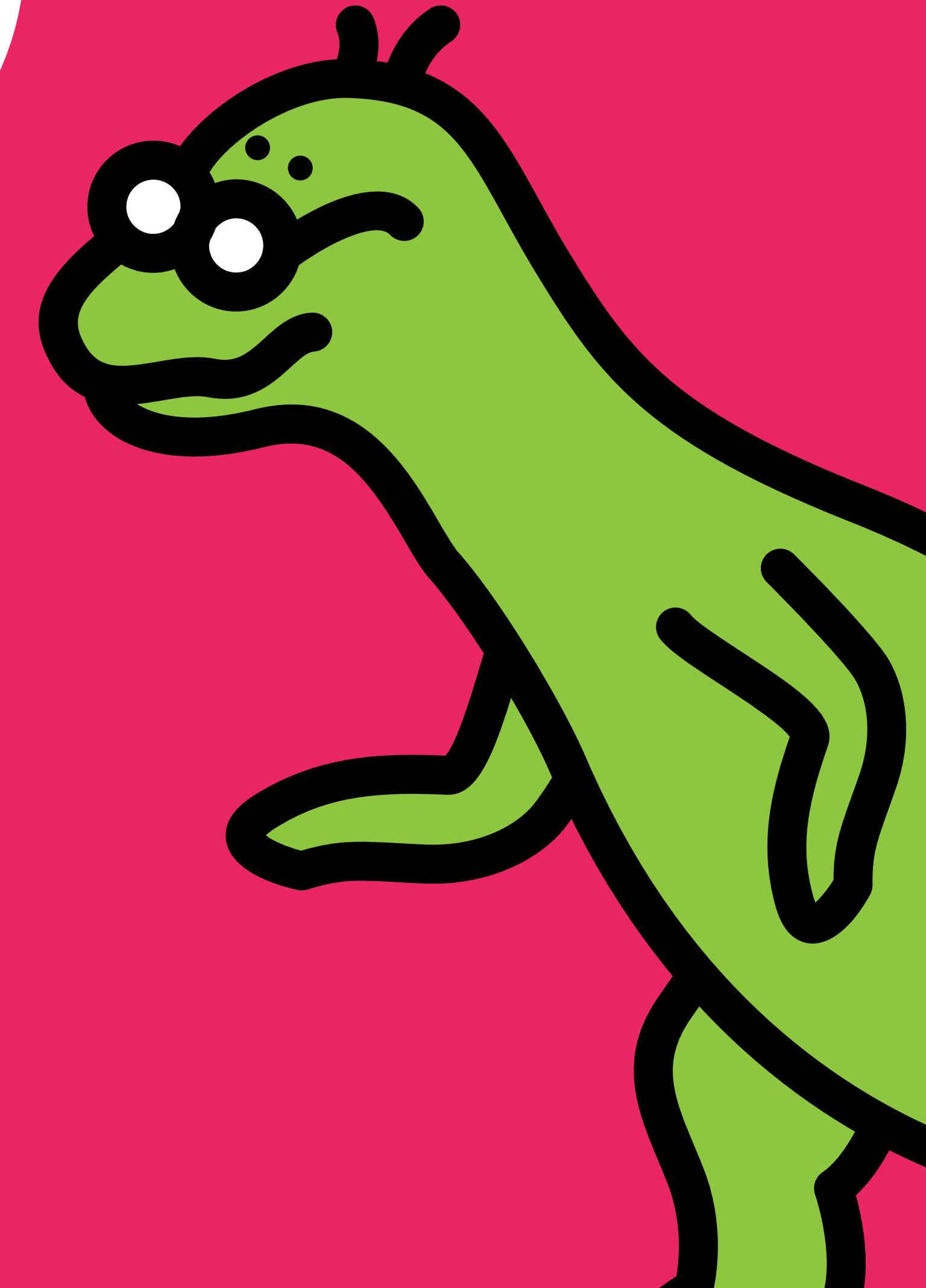
Add an item

ADD

polymer-todo.firebaseioapp.com

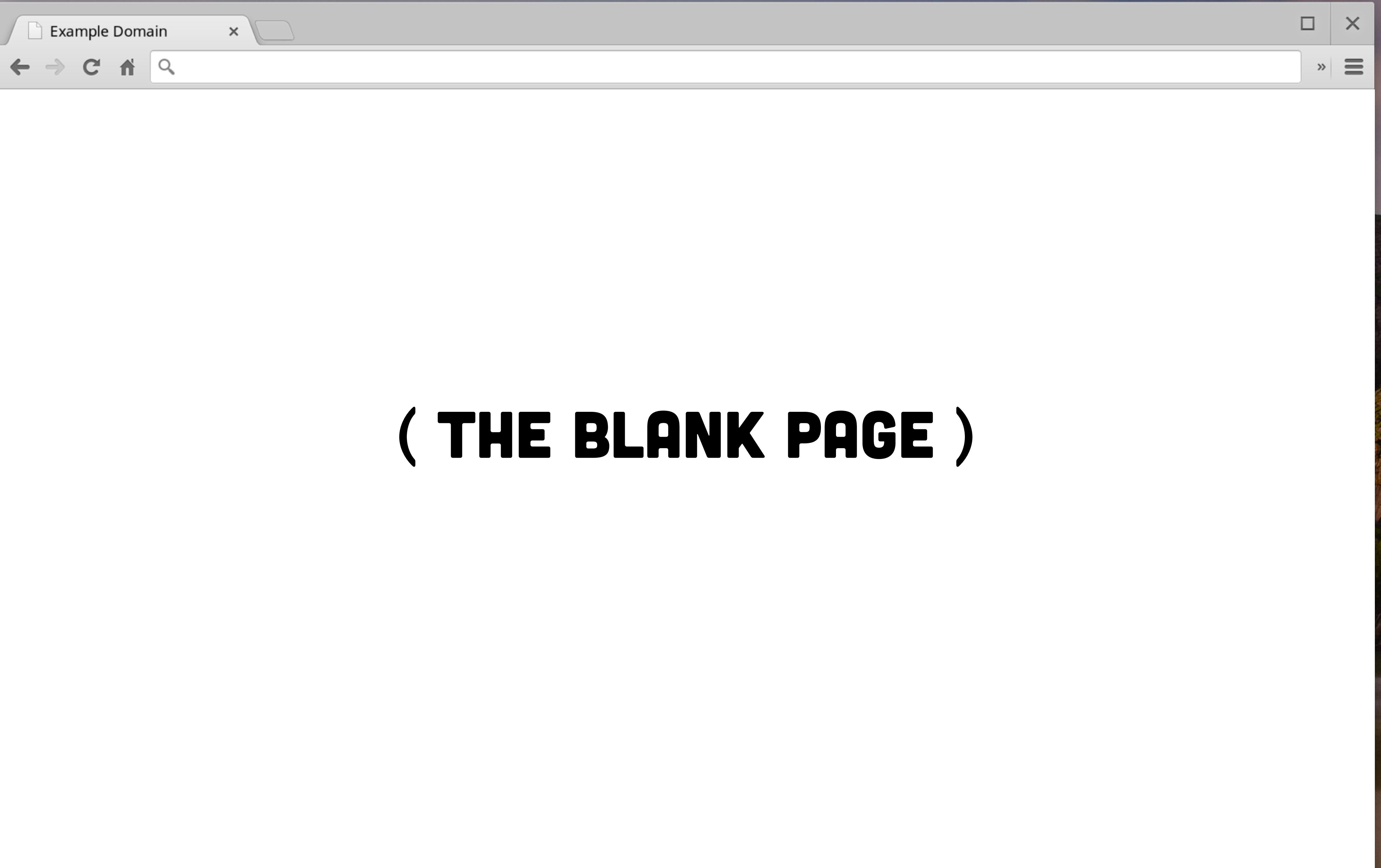
Solutions to **PROBLEMS**

#wisdom



Problem





Web Development is

COMPLICATED



Concat &

Responsive design

Grunt? Gulp?

APP MANIFEST

Offline caching

Optimizing images

Homescreen icons



Polymer Starter Kit



Responsive app layout & routing



Components for nearly any app, out of the box.



Unit test support with Web Component Tester



Complete build chain for bringing your app to production.



DOWNLOAD

developers.google.com/web/tools/polymer-starter-kit

Google <https://www.google.com/webhp?hl=en#hl=en&q=Polymer+Starter+kit>

Polymer Starter Kit

- polymer starter kit
- polymer starter kit **demo**
- polymer starter kit **tutorial**
- polymer starter kit **github**

About 439,000 results (0.31 seconds)

Polymer Starter Kit — Web Fundamentals

<https://developers.google.com/.../polymer-starter-kit/index.html?h...> ▾ Google ▾
... Polymer in production. Start your project with the Polymer Starter Kit to get the most out of the library, elements built with Polymer, and Polymer-related tools.

PolymerElements/polymer-starter-kit · GitHub

<https://github.com/PolymerElements/polymer-starter-kit> ▾
Sep 2, 2015 - Download and extract Polymer Starter Kit to where you want to work.
The standard version of Polymer Starter Kit comes with tools that are very ...
App - Issues 57 - Polymer Starter Kit 1.0.0 - Bower.json

Releases · PolymerElements/polymer-starter-kit · GitHub

<https://github.com/polymerelements/polymer-starter-kit/releases> ▾
polymer-starter-kit-1.0.3.zip - the kit with all of our build process & developer tooling and (optional) offline support. Use this version if building something you're ...

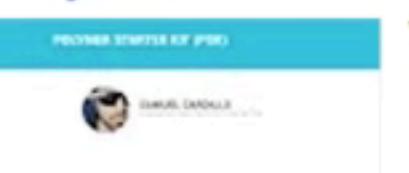
Get the Polymer library - Polymer 1.0

<https://www.polymer-project.org/1.0/docs/start/getting-the-code.html> ▾
The recommended way to install Polymer 1.0 is through Bower. ... A "batteries-included" application template, the Polymer Starter Kit includes a responsive ...

Polymer Starter Kit -- Polycasts #18 - YouTube

 www.youtube.com/watch?v=xz-yixRxZN8
Jun 15, 2015 - Uploaded by Google Developers
Polymer Starter Kit is full of amazing tricks! Let's do a quick introduction and see how to update the theme with ...

Polymer Starter Kit: A first look - YouTube

 www.youtube.com/watch?v=K4Vu2ylaTSM
May 31, 2015 - Uploaded by Samuel LESPES CARDILLO
Hello everyone ! This video is about the Polymer Starter Kit which

BUT ROB,
I'm *super lazy*



npm install generator-polymer -g

OH SNAP!

→ my-app

|

Problem



Problem

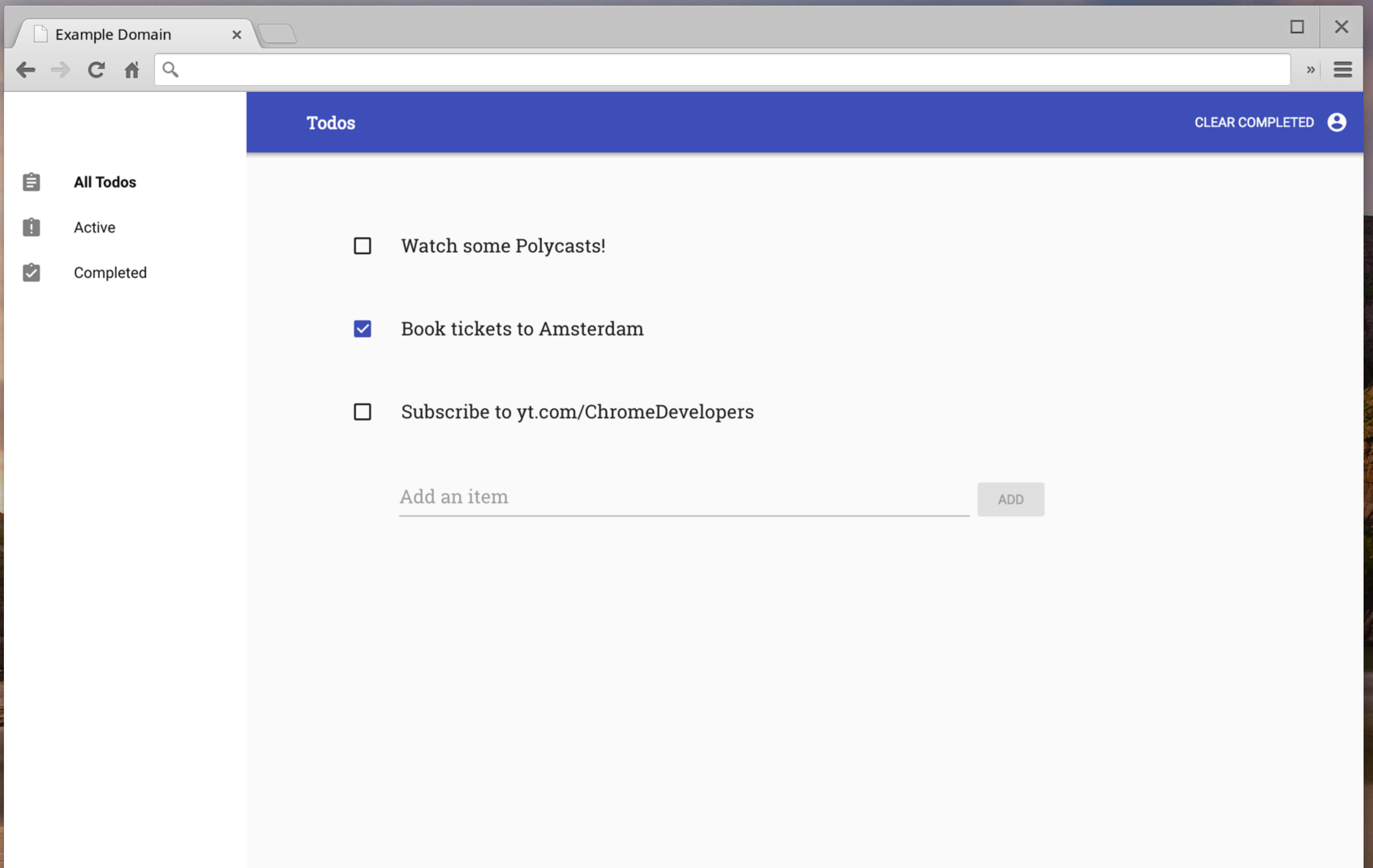




Breaking up
the app

BUILD YOUR APP
out of small
components





Example Domain

Todos

CLEAR COMPLETED

All Todos

Active

Completed

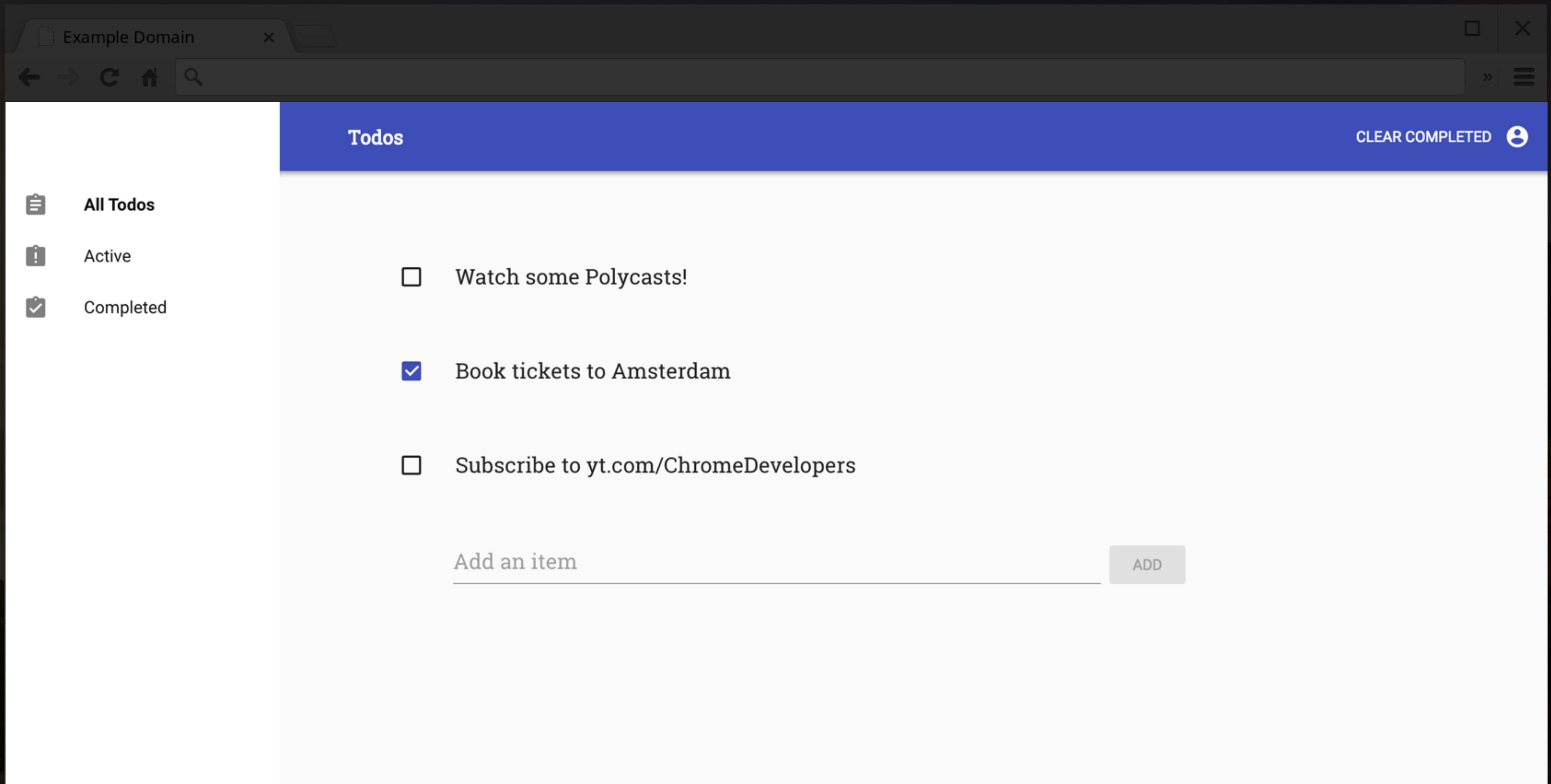
Watch some Polycasts!

Book tickets to Amsterdam

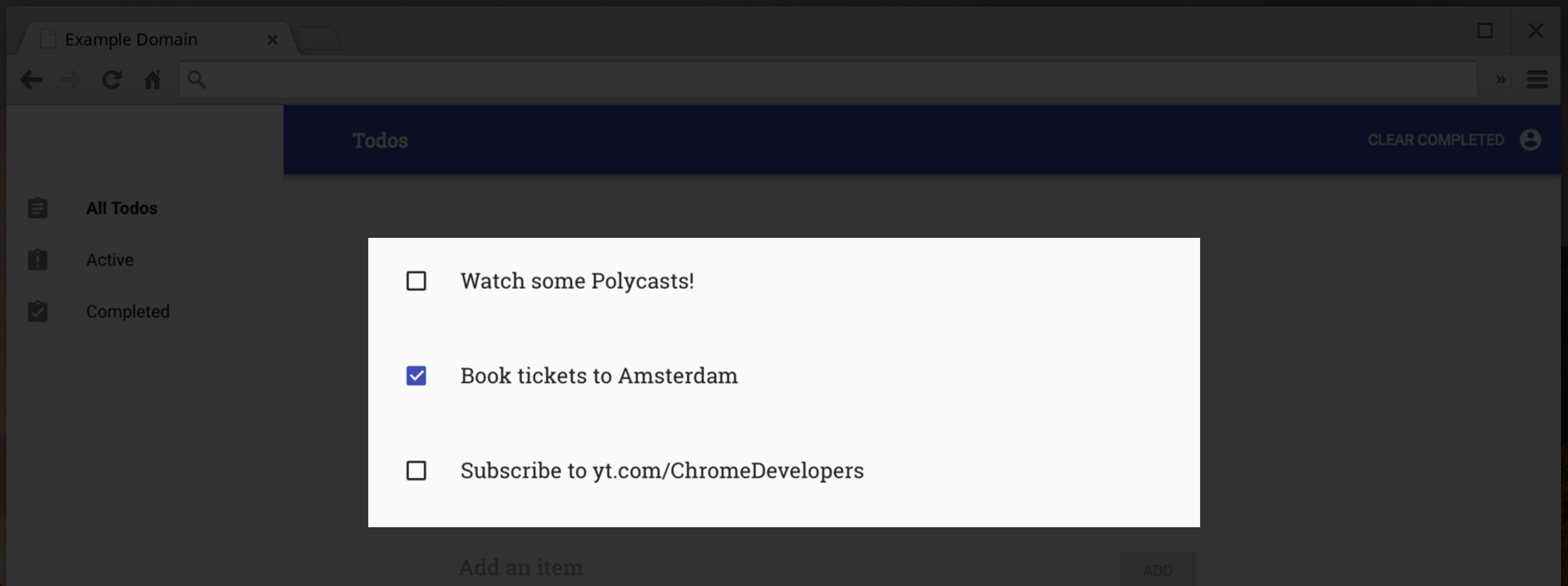
Subscribe to yt.com/ChromeDevelopers

Add an item

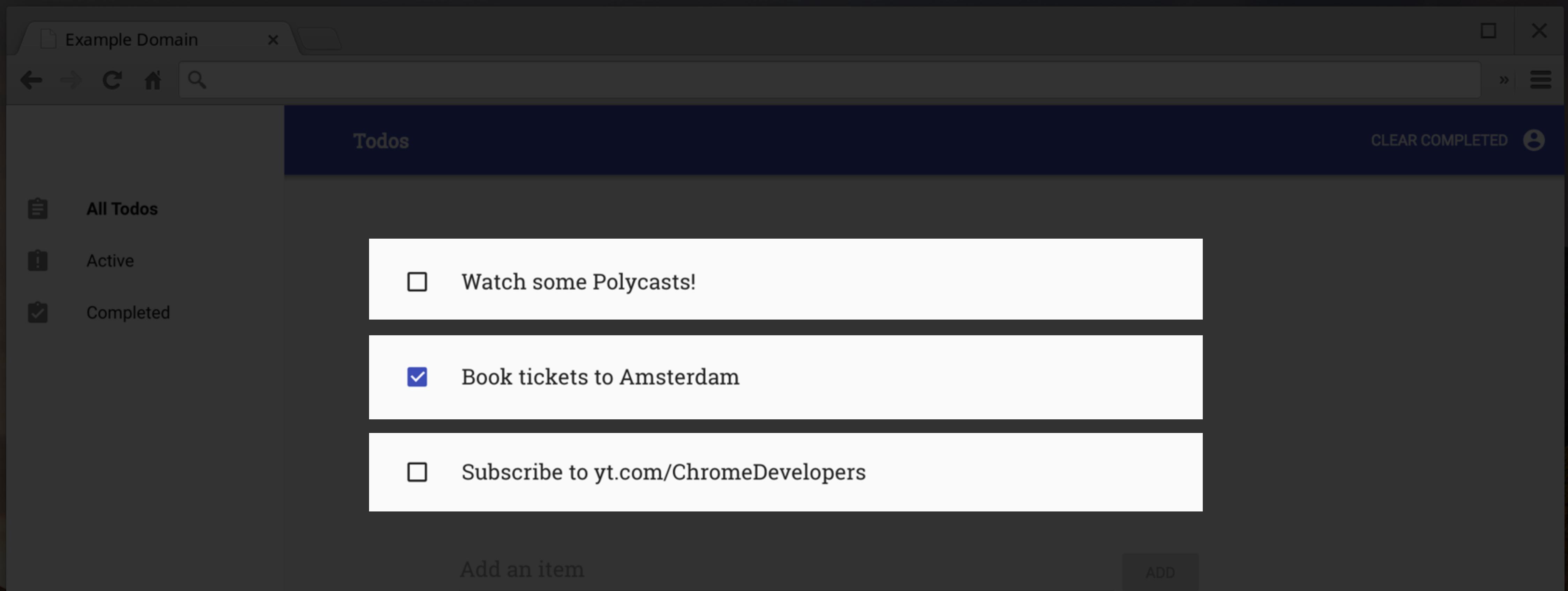
ADD



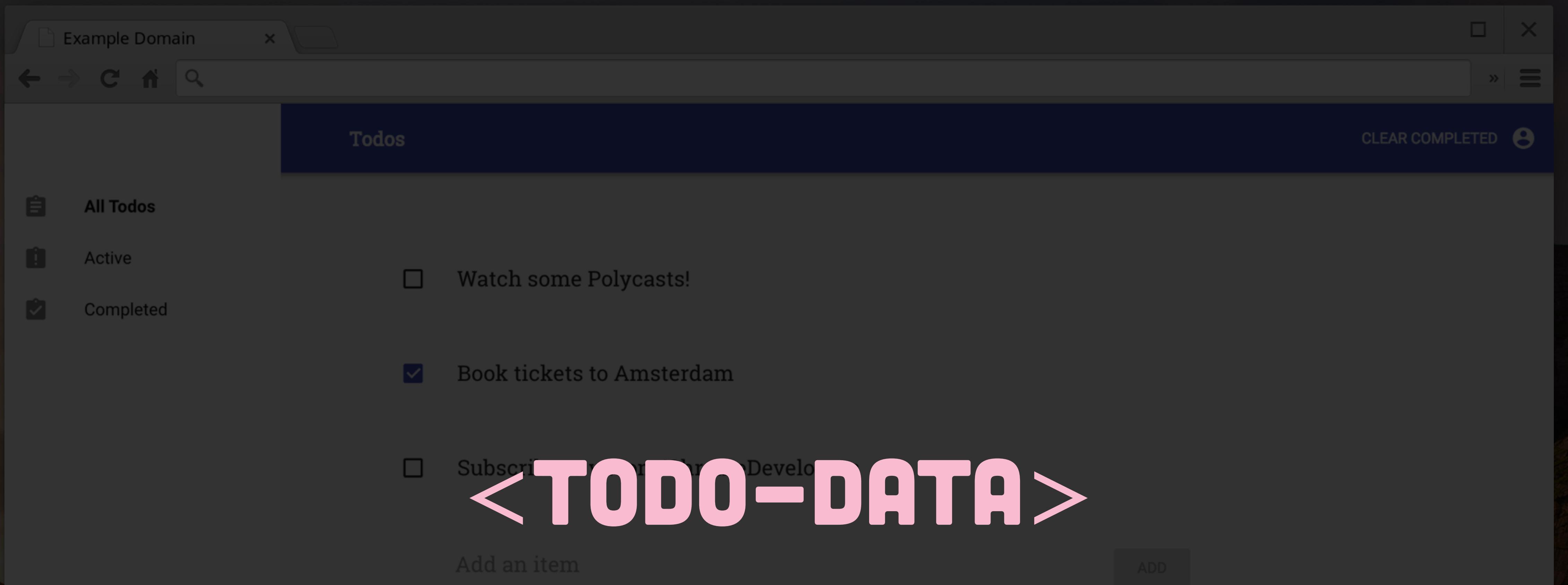
⟳ <TODO-VIEW>

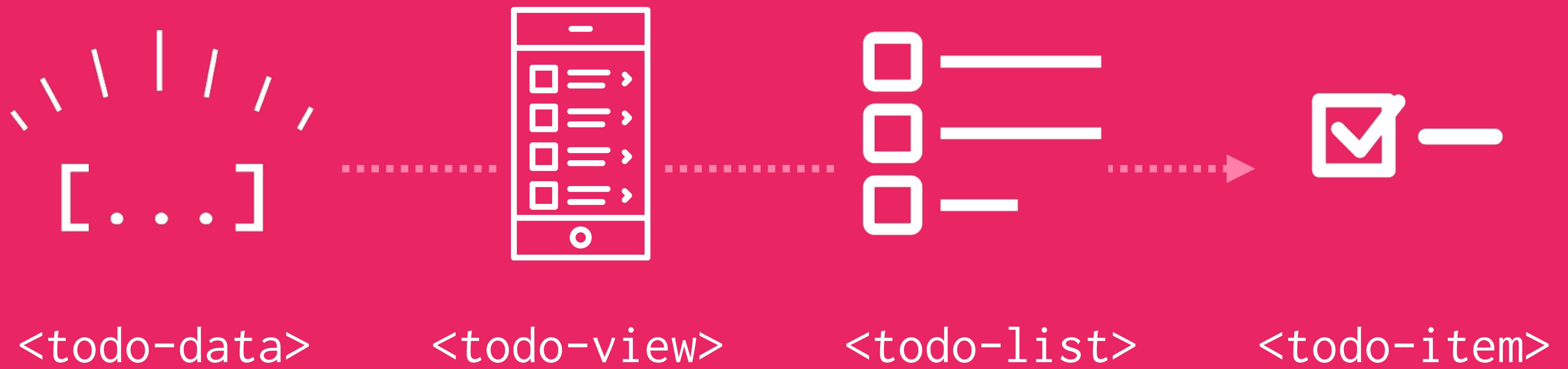


<TODO-LIST>



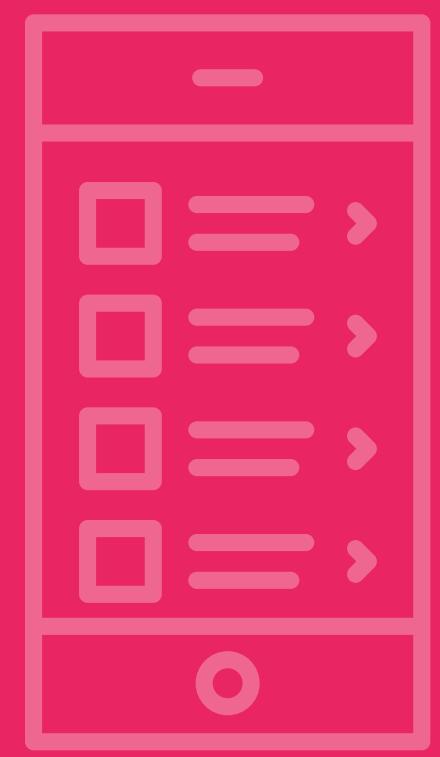
<TODO-ITEM>



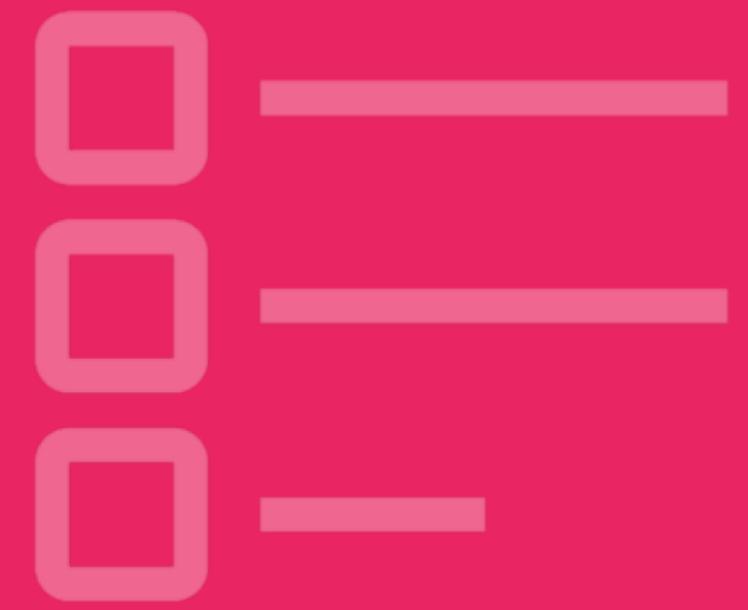


...
[. . .]

<todo-data>



<todo-view>



<todo-list>



<todo-item>

todo-data.html

```
<dom-module id="todo-data">
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
          notify: true,
          value: function() {
            return [
              {
                label: 'My first todo!',
                isComplete: false
              },
              ...
            ];
          }
        }
      }
    });
  </script>
</dom-module>
```

```
<dom-module id="todo-data">
<script>
Polymer({
  is: 'todo-data',
  properties: {
    todos: {
      notify: true,
      value: function() {
        return [
          {
            label: 'My first todo!',
            isComplete: false
          },
          ...
        ];
      }
    }
  }
});
</script>
</dom-module>
```

todo-data.html

Todos are
objects in
an **array**

```
<dom-module id="todo-data">
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
          notify: true,
          value: function() {
            return [
              {
                label: 'My first todo!',
                isComplete: false
              },
              ...
            ];
          }
        }
      }
    });
  </script>
</dom-module>
```

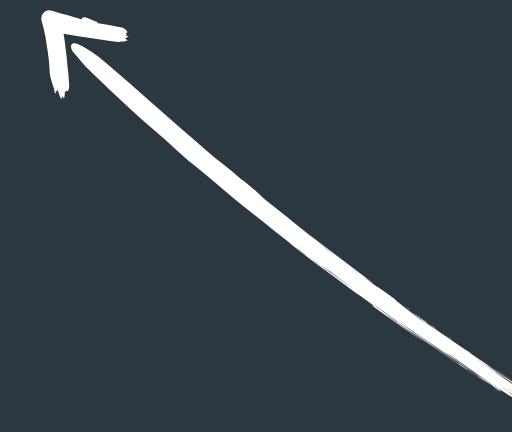
todo-data.html

Todos are
bindable

an element for data?
that's CRAZY TALK!

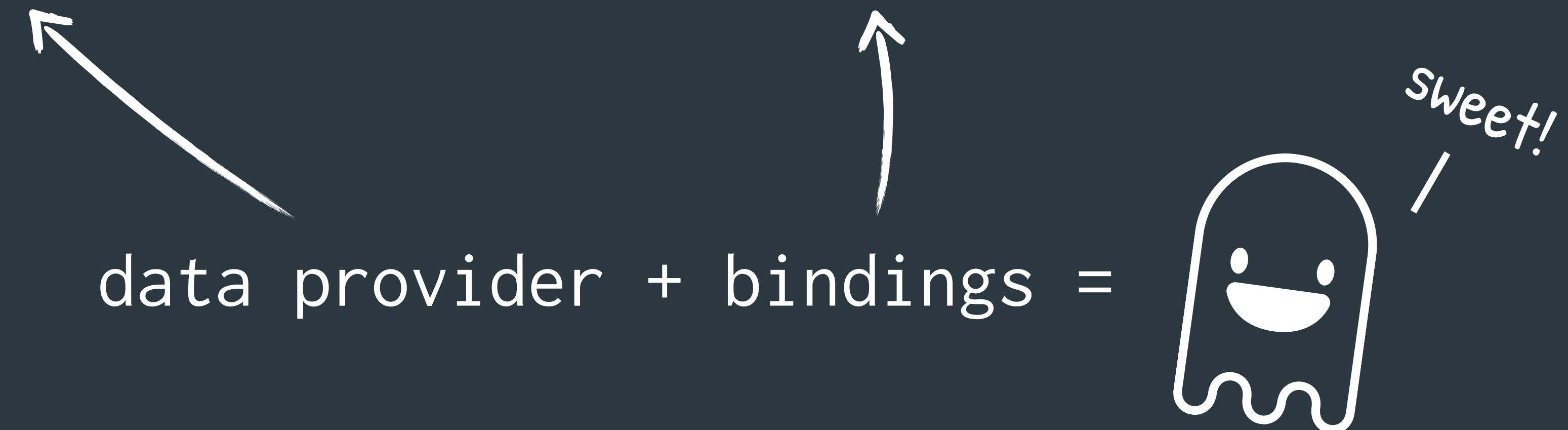


<todo-data></todo-data>



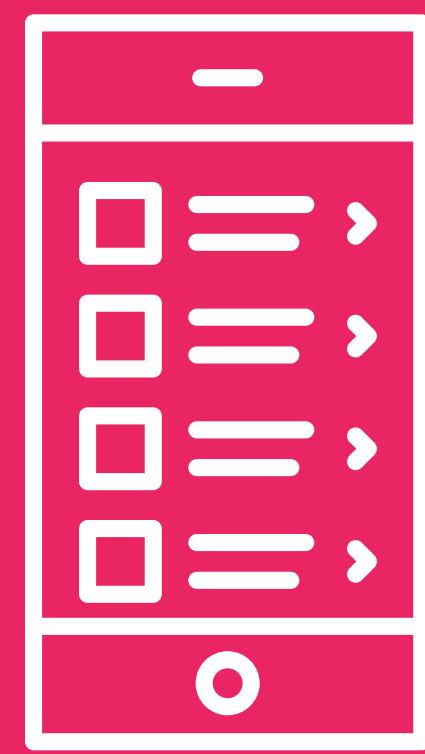
data provider

```
<todo-data todos="{{todos}}"></todo-data>
```

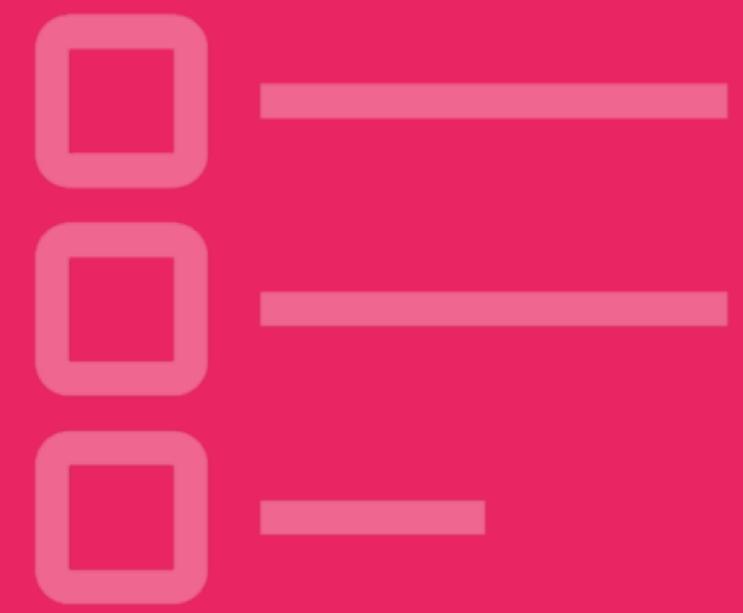




<todo-data>



<todo-view>



<todo-list>



<todo-item>

todo-view.html

```
<dom-module id="todo-view">
  <template>
    <todo-list todos="{{todos}}"></todo-list>
  </template>
  <script>
    Polymer({
      is: 'todo-view',
      properties: {
        todos: Array
      }
    });
  </script>
</dom-module>
```

todo-view.html

```
<dom-module id="todo-view">
  <template>
    <todo-list todos="{{todos}}"></todo-list>
  </template>
  <script>
    Polymer({
      is: 'todo-view',
      properties: {
        todos: Array
      }
    });
  </script>
</dom-module>
```



Bind data to reduce
boilerplate



All Todos



Active



Completed

 First todo Second todo  Random todo Foo

Add an item

ADD

Todos

CLEAR COMPLETED



All Todos



Active



Completed

First todo

Second todo

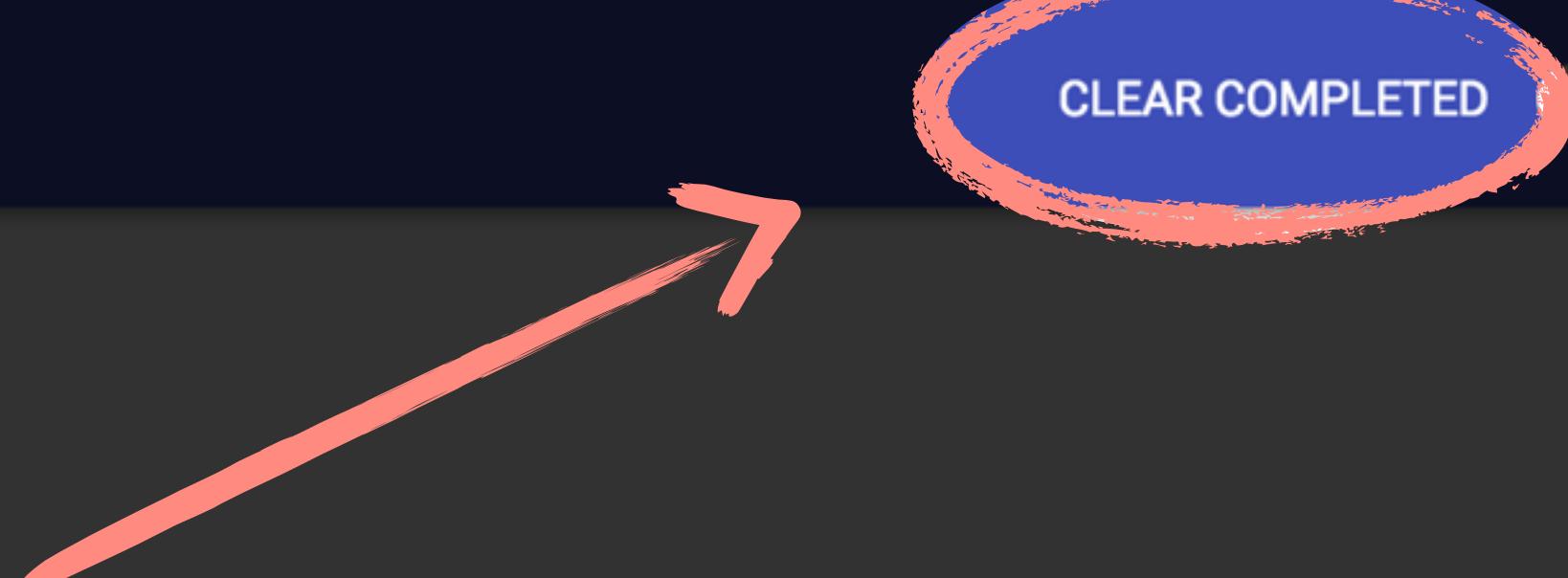


Random todo

Foo

Add an item

ADD



Todos

CLEAR COMPLETED

All Todos

Active

Completed

First todo

Second todo

Random todo

Foo

Add an item

ADD



Todos

CLEAR COMPLETED

- All Todos
- Active
- Completed

First todo

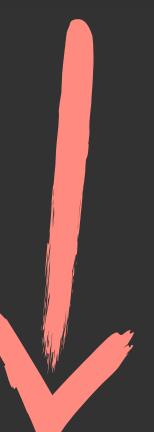
Second todo

Random todo

Foo

Add an item

ADD



All Todos

Active

Completed

Need to COMMUNICATE

 Random todo Foo

Add an item

ADD



```
<dom-module id="todo-view">                                todo-view.html
  <template>
    <paper-button class="clear-btn" on-tap="clearTodos">
    <todo-list todos="{{todos}}" on-delete-todo="deleteTodo">
    </todo-list>
    <todo-input on-add-todo="addTodo"></todo-input>
  </template>
  <script>
    Polymer({
      is: 'todo-view',
      properties: {
        todos: Array
      },
      clearTodos: function() { ... },
      deleteTodo: function() { ... },
      addTodo: function() { ... }
    });
  </script>
</dom-module>
```

```
<dom-module id="todo-view">          todo-view.html
  <template>
    <paper-button class="clear-btn" on-tap="clearTodos">
    <todo-list todos="{{todos}}" on-delete-todo="deleteTodo">
    </todo-list>
    <todo-input on-add-todo="addTodo"></todo-input>
  </template>
  <script>
    Polymer({
      is: 'todo-view',
      properties: {
        todos: Array
      },
      clearTodos: function() { ... },
      deleteTodo: function() { ... },
      addTodo: function() { ... }
    });
  </script>
</dom-module>
```

Mediate events

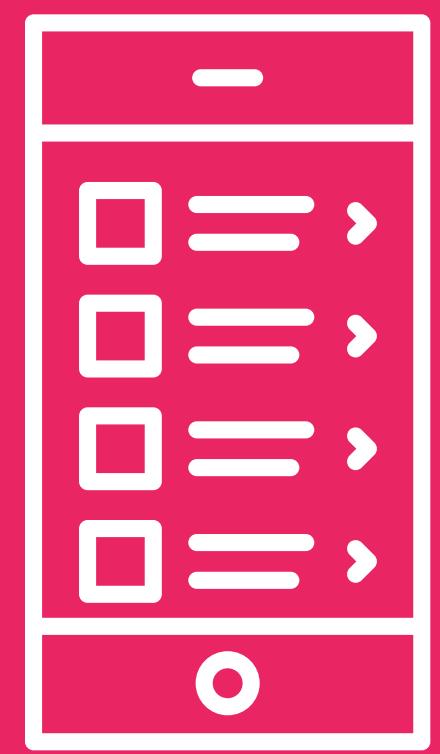
```
addTodo: function(e) {
  this.push('todos', {
    label: e.detail.value,
    isComplete: false
  });
}
```

Kinda like a
traffic cop

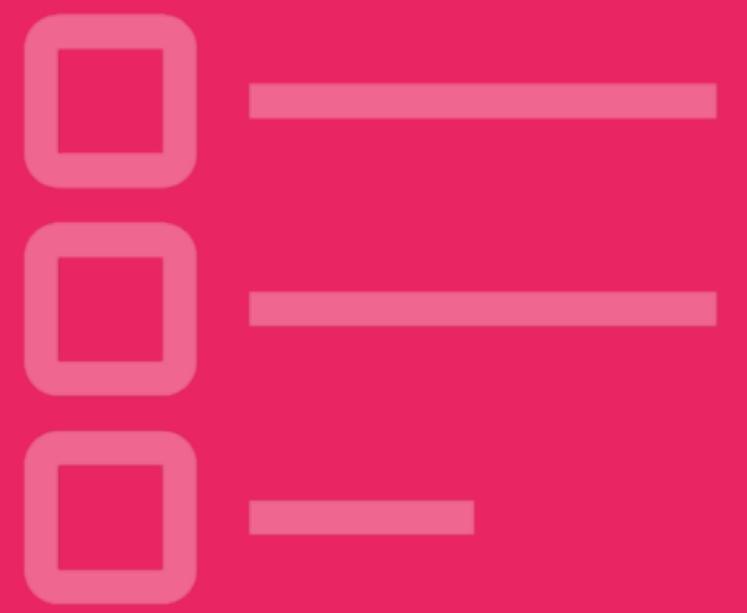




<todo-data>



<todo-view>



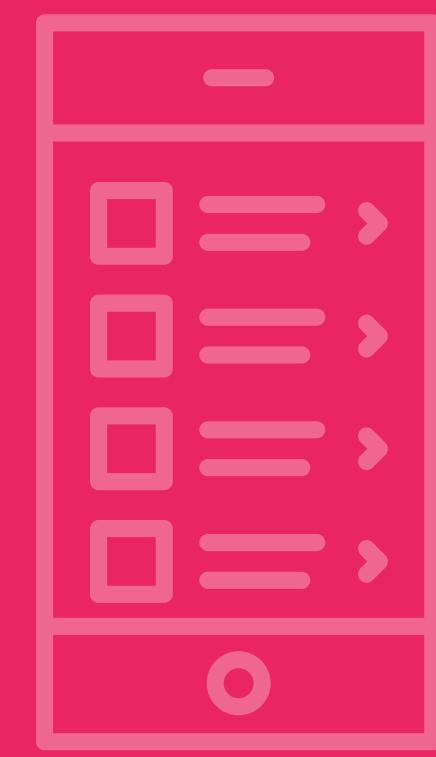
<todo-list>



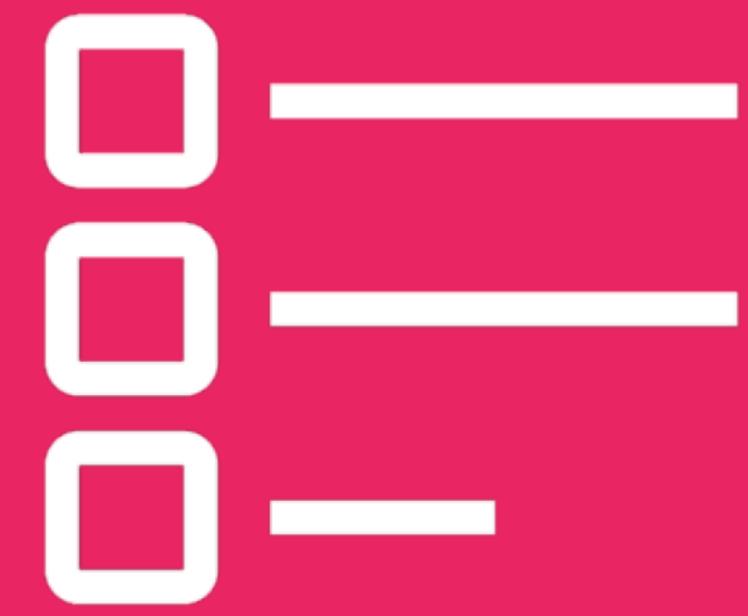
<todo-item>



<todo-data>



<todo-view>



<todo-list>



<todo-item>



You could
type this
yourself

Or you could be
AWESOME



yo polymer:element



yo polymer:element



→ todo-list git:(master) x |

1. robododson@robododson-macbookpro: ~/Developer/todo-list (zsh)

|

```
<dom-module id="todo-list">
  <template>
    <template is="dom-repeat"
      items="{{todos}}"
      as="todo">
      <todo-item todo="{{todo}}></todo-item>
    </template>
  </template>
  <script>
    Polymer({
      is: 'todo-list',
      properties: {
        todos: Array
      }
    });
  </script>
</dom-module>
```

todo-list.html

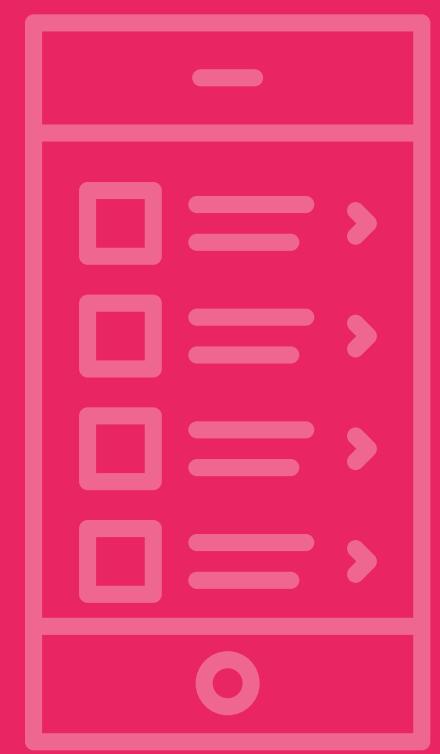
```
<dom-module id="todo-list">  
  <template>  
    <template is="dom-repeat"  
              items="{{todos}}"  
              as="todo">  
      <todo-item todo="{{todo}}"></todo-item>  
    </template>  
  </template>  
  <script>  
    Polymer({  
      is: 'todo-list',  
      properties: {  
        todos: Array  
      }  
    });  
  </script>  
</dom-module>
```

todo-list.html

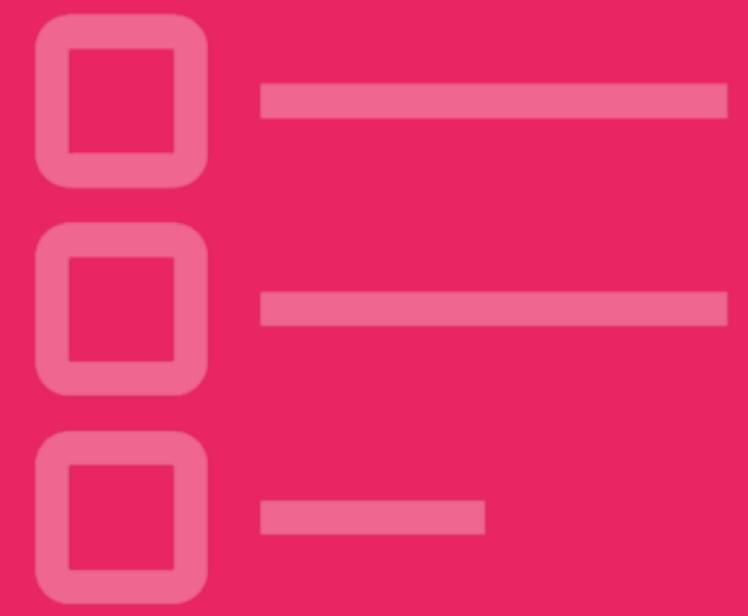
Iterate over data
with **dom-repeat**



<todo-data>



<todo-view>



<todo-list>



<todo-item>

```
<dom-module id="todo-item">
  <template>
    <paper-checkbox checked="{{todo.isComplete}}></paper-checkbox>
    <paper-input value="{{todo.label}}></paper-input>
    <paper-icon-button icon="todo-icons:delete" on-tap="_onDelete">
    </paper-icon-button>
  </template>
  <script>
    Polymer({
      is: 'todo-item',
      properties: {
        todo: Object
      },
      _onDelete: function() {
        this.fire('delete-todo', {todo: this.todo});
      }
    });
  </script>
</dom-module>
```

todo-item.html

```
<dom-module id="todo-item">
  <template>
    <paper-checkbox checked="{{todo.isComplete}}"></paper-checkbox>
    <paper-input value="{{todo.label}}"></paper-input>
    <paper-icon-button icon="todo-icons:delete" on-tap="_onDelete">
    </paper-icon-button>
  </template>
  <script>
    Polymer({
      is: 'todo-item',
      properties: {
        todo: Object
      },
      _onDelete: function() {
        this.fire('delete-todo', {todo: this.todo});
      }
    });
  </script>
</dom-module>
```

todo-item.html

Bind data to reduce
boilerplate

```
<dom-module id="todo-item">
  <template>
    <paper-checkbox checked="{{todo.isComplete}}"></paper-checkbox>
    <paper-input value="{{todo.label}}"></paper-input>
    <paper-icon-button icon="todo-icons:delete" on-tap="_onDelete">
    </paper-icon-button>
  </template>
  <script>
    Polymer({
      is: 'todo-item',
      properties: {
        todo: Object
      },
      _onDelete: function() {
        this.fire('delete-todo', {todo: this.todo});
      }
    });
  </script>
</dom-module>
```

todo-item.html

Mediate events

 All Todos Active Completed Watch some Polycasts! Book tickets to Amsterdam Subscribe to yt.com/ChromeDevelopers

Add an item

ADD



All Todos

Active

Completed

 Watch some Polycasts!

Add an item

ADD

Problem

#



Getting to *production*

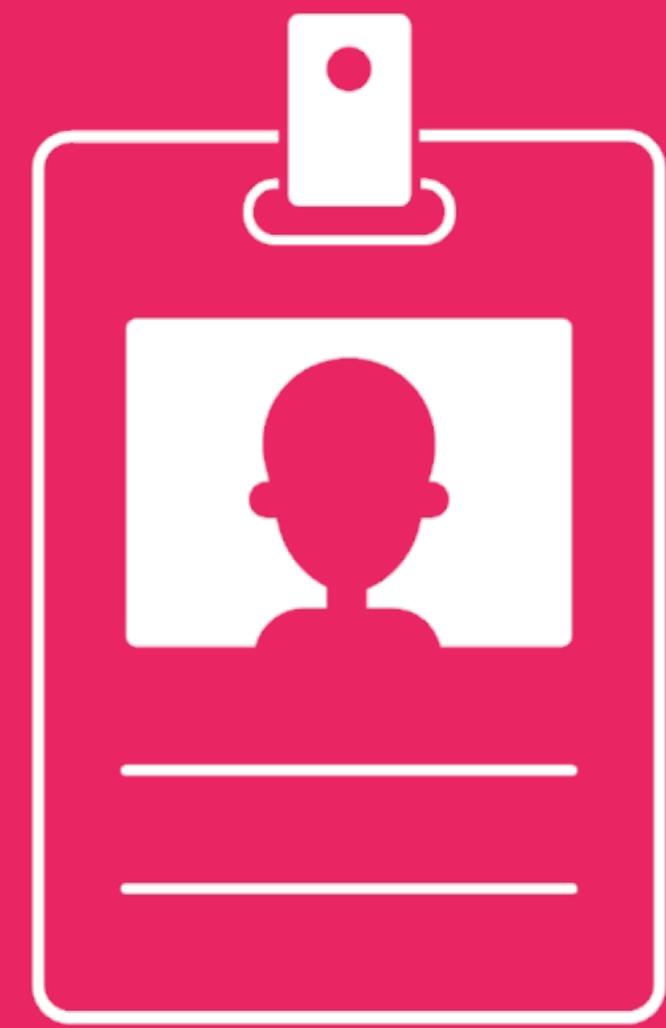




Firebase



REALTIME DATABASE



AUTHENTICATION



HOSTING

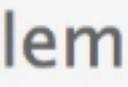


REALTIME DATABASE

```
// Create a connection to Firebase
var ref = new Firebase('https://<YOUR-FIREBASE-APP>.firebaseio.com');

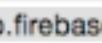
// Write some data
ref.set({ name: 'Rob Dodson' });

// Push Array-like data
ref.push({ isComplete: false, label: 'A new todo!' });
```

Elements Network Console >      

<top frame>  Preserve log

> 

Firebase App Dashboard       https://polymer-todo.firebaseio.com/

Dashboard

VIEWING POLYMER TODO

 Data  

 Security & Rules

 Simulator

 Analytics

 Login & Auth

 Hosting

 Secrets

POLYMER-TODO

polymer-todo: null  

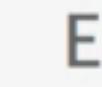
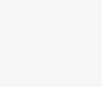
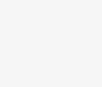
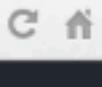
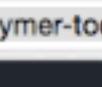
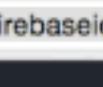
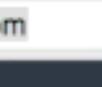
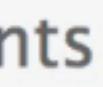
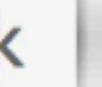
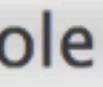
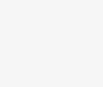
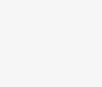
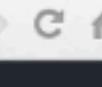
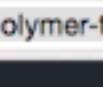
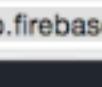
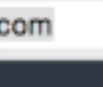
 

Legend

- Changed
- Added
- Deleted
- Moved

 View your data in Chrome's DevTools with [Vulcan](#)

```
// Listen for changes from Firebase
ref.on('value', function(snapshot) {
  console.log(snapshot.val());
});
```

Elements Network Console >                                                                <img alt="More icons" data-b


```
<dom-module id="todo-data">  
  <script>  
    Polymer({  
      is: 'todo-data',  
      properties: {  
        todos: {  
          notify: true,  
          value: function() {  
            return [  
              {  
                label: 'My first todo!',  
                isComplete: false  
              },  
              ...  
            ];  
          }  
        }  
      }  
    })  
  </script>  
</dom-module>
```

Just an
array

todo-data.html

[. . .]





“*There's an element for that***”**

```
<dom-module id="todo-data">
  <script>
    Polymer( {
      is: 'todo-data',
      properties: {
        todos: {
          notify: true,
          value: function() {
            return [
              {
                label: 'My first todo!',
                isComplete: false
              },
              ...
            ];
          }
        }
      }
    });
  </script>
</dom-module>
```

todo-data.html

```
<dom-module id="todo-data">
  <script>
    Polymer( {
      is: 'todo-data' ,
      properties: {
        todos: {
          notify: true
        }
      }
    }) ;
  </script>
</dom-module>
```

todo-data.html

```
<dom-module id="todo-data">  
  <template>  
    <firebase-collection data="{{todos}}"  
      location="https://polymer-todo.firebaseio.com">  
      </firebase-collection>  
    </template>  
    <script>  
      Polymer({  
        is: 'todo-data',  
        properties: {  
          todos: {  
            notify: true  
          }  
        }  
      });  
    </script>  
</dom-module>
```

todo-data.html

```
<dom-module id="todo-data">
  <template>
    <firebase-collection data="{{todos}}"
      location="https://polymer-todo.firebaseio.com">
      </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
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        todos: {
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  <template>
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      location="https://polymer-todo.firebaseio.com">
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todo-data.html

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<dom-module id="todo-data">
  <template>
    <firebase-collection data="{{todos}}"
      location="{{location}}">
      </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
          notify: true
        }
      }
    });
  </script>
</dom-module>
```

todo-data.html

index.html

```
<body>

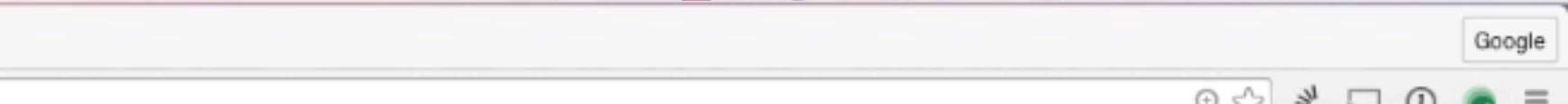
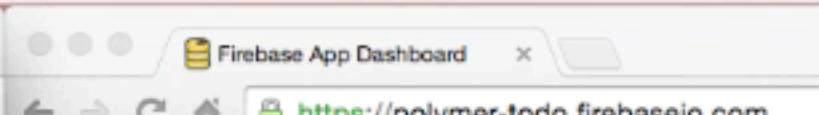
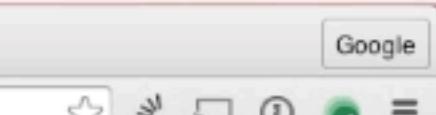
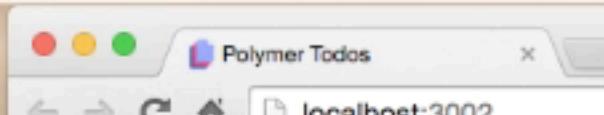
<template is="dom-bind">

  <todo-data todos="{{todos}}"
    location="https://polymer-todo.firebaseio.com">
  </todo-data>

  <todo-view todos="{{todos}}"></todo-view>

</template>

</body>
```



Todos

CLEAR COMPLETED

All Todos

Active

Completed

No more todos! You're all caught up

Add an item

Dashboard

VIEWING POLYMER TODO

Data

Security & Rules

Simulator

Analytics

Login & Auth

Hosting

Secrets

Expand Data Collapse Data

POLYMER-TODO

polymer-todo: null

Legend

- Changed
- Added
- Deleted
- Moved

View your data in Chrome's DevTools with [Vulcan](#)







https://polymer-todo.firebaseio.com

Todos

CLEAR COMPLETED

Go for a jog

Add an item

ADD

Dashboard

VIEWING POLYMER TODO

Data

Security & Rules

Simulator

Analytics

Login & Auth

Hosting

Secrets

Expand Data

Collapse Data

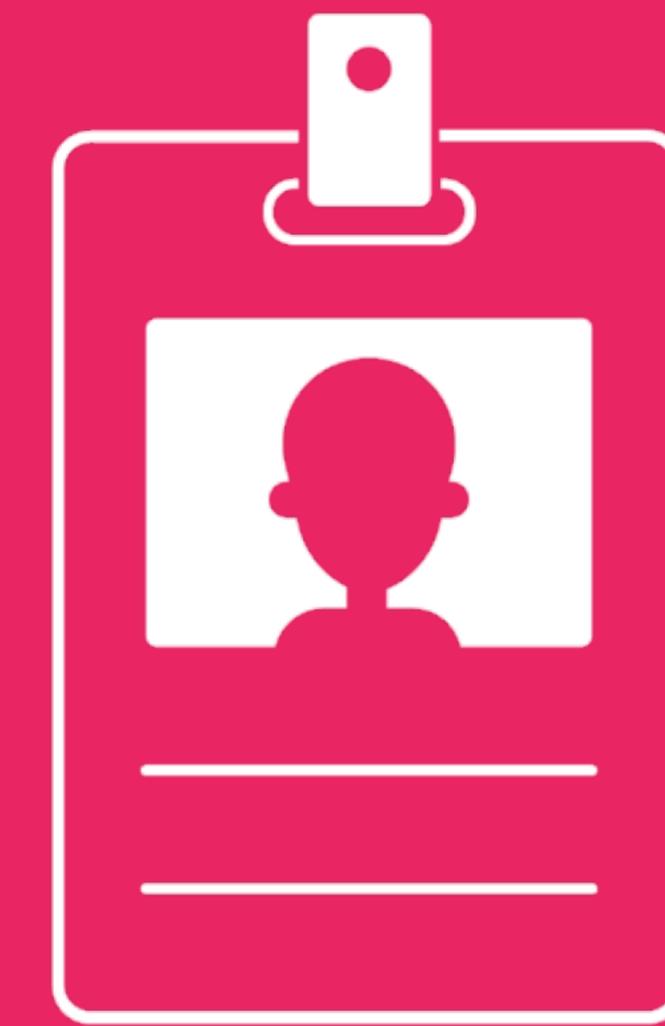
Import Data

Export Data

POLYMER-TODO

polymer-todo

- users
 - google:118271135596408598424
 - Jys1JBqG5-UCVWGqRRm
 - isComplete: false
 - label: "Go for a jog"



AUTHENTICATION



Data



Security & Rules



Simulator



Analytics



Login & Auth



Hosting

Clear Changes

Security & Rules Documentation

FIREBASE RULES

Save Rules

```
1  {  
2    "rules": {  
3      ".read": true,  
4      ".write": true  
5    }  
6  }
```



```
{  
  "rules": {  
    "users": {  
      "$uid": {  
        ".write": "auth.uid === $uid",  
        ".read": "auth.uid === $uid"  
      }  
    }  
  }  
}
```

Path to a
unique ID

```
{  
  "rules": {  
    "users": {  
      "$uid": {  
        ".write": "auth.uid === $uid",  
        ".read": "auth.uid === $uid"  
      }  
    }  
  }  
}
```

The user's
unique ID

```
{  
  "rules": {  
    "users": {  
      "$uid": {  
        ".write": "auth.uid === $uid",  
        ".read": "auth.uid === $uid"  
      }  
    }  
  }  
}
```

Authenticated user's ID
must match the path

```
// Authenticate a user with Google Sign in
ref.authWithOAuthPopup('google', function(error, authData) {
  // Get the user's todo list
  this.userRef = this.ref.child('users/' + authData.uid);
});
```

“ *There's an element for that too* **”**

```
<dom-module id="todo-data">
  <template>
    <firebase-collection data="{{todos}}"
      location="{{location}}">
    </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
          notify: true
        }
      }
    });
  </script>
</dom-module>
```

todo-data.html

```
<dom-module id="todo-data">
  <template>
    <firebase-auth id="auth"
      location="{{location}}"
      provider="google"
      user="{{user}}>
    </firebase-auth>
    <firebase-collection data="{{todos}}"
      location="{{location}}>
    </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
          notify: true
        }
      }
    });
  </script>
</dom-module>
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todo-data.html

todo-data.html

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<dom-module id="todo-data">
  <template>
    <firebase-auth id="auth"
      location="{{location}}"
      provider="google"
      user="{{user}}">
    </firebase-auth>
    <firebase-collection data="{{todos}}"
      location="{{location}}">
    </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
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todo-data.html

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<dom-module id="todo-data">
  <template>
    <firebase-auth id="auth"
      location="{{location}}"
      provider="google"
      user="{{user}}>
    </firebase-auth>
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      location="{{location}}>
    </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
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todo-data.html

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<dom-module id="todo-data">
  <template>
    <firebase-auth id="auth"
      location="{{location}}"
      provider="google"
      user="{{user}}>
    </firebase-auth>
    <firebase-collection data="{{todos}}"
      location="{{location}}>
    </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
          notify: true
        }
      }
    });
  </script>
</dom-module>
```

```
<paper-dialog modal opened="{{!user}}">  
  ...  
</paper-dialog>
```

No user?
Open the sign-in dialog



Find the user's todos in Firebase

```
_userChanged: function(user) {  
  if (user) {  
    this.userLocation = [   
      this.location, 'users', this.user.uid  
    ].join('/');  
  }  
}
```

```
<dom-module id="todo-data">
  <template>
    <firebase-auth id="auth"
      location="{{location}}"
      provider="google"
      user="{{user}}>
    </firebase-auth>
    <firebase-collection data="{{todos}}"
      location="{{userLocation}}>
    </firebase-collection>
  </template>
  <script>
    Polymer({
      is: 'todo-data',
      properties: {
        todos: {
          notify: true
        }
      }
    });
  </script>
</dom-module>
```

todo-data.html

https://polymer-todo.firebaseio.com





HOSTING



```
npm install -g firebase-tools
```

→ todo-list git:(master) x

→ todo-list git:(master) |

|

Problem

#



Get rolling with
POLYMER STARTER KIT

Break your app into
SMALL ELEMENTS

Use Firebase to
GET TO PRODUCTION

- Web Components polyfills
- Polymer!
- An HTML file

bit.ly/polycasts

thanks!



@rob_dodson
+RobDodson

credits

Images by Gregor Črešnar, Aenne Brielmann, Michal Beno, Golden Roof, Rohith M S, Till Teenck, Julien Deveaux, Garrett Knoll, Matt Brooks, Nick Kinling, Brad Ashburn, Juan Pablo Bravo, Nicolas Vicent, Aha-Soft, Nicky Knicky, Max Cougar Oswald & Nihir Shah