Reacting to Actions

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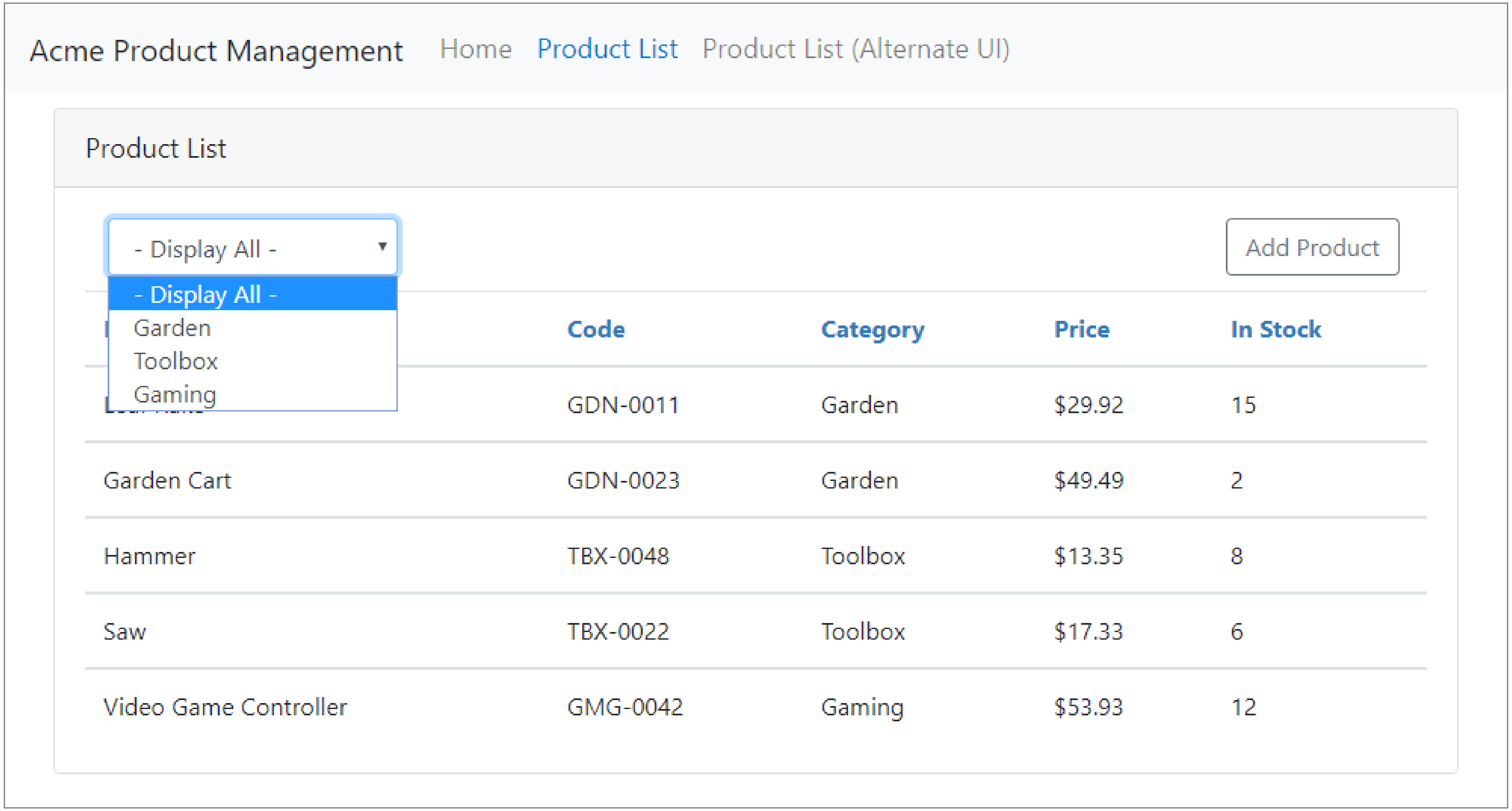


Acme Product Management Home Product List Product List (Alternate UI)

Product List

[illegible]	Code	Category	Price	In Stock
[illegible]	GDN-0011	Garden	$29.92	15
Garden Cart	GDN-0023	Garden	$49.49	2
Hammer	TBX-0048	Toolbox	$13.35	8
Saw	TBX-0022	Toolbox	$17.33	6
Video Game Controller	GMG-0042	Gaming	$53.93	12

Module Overview

Filtering a stream

Data stream vs. action stream

Subject and BehaviorSubject

Reacting to actions

Starting with an initial value

RxJS Features

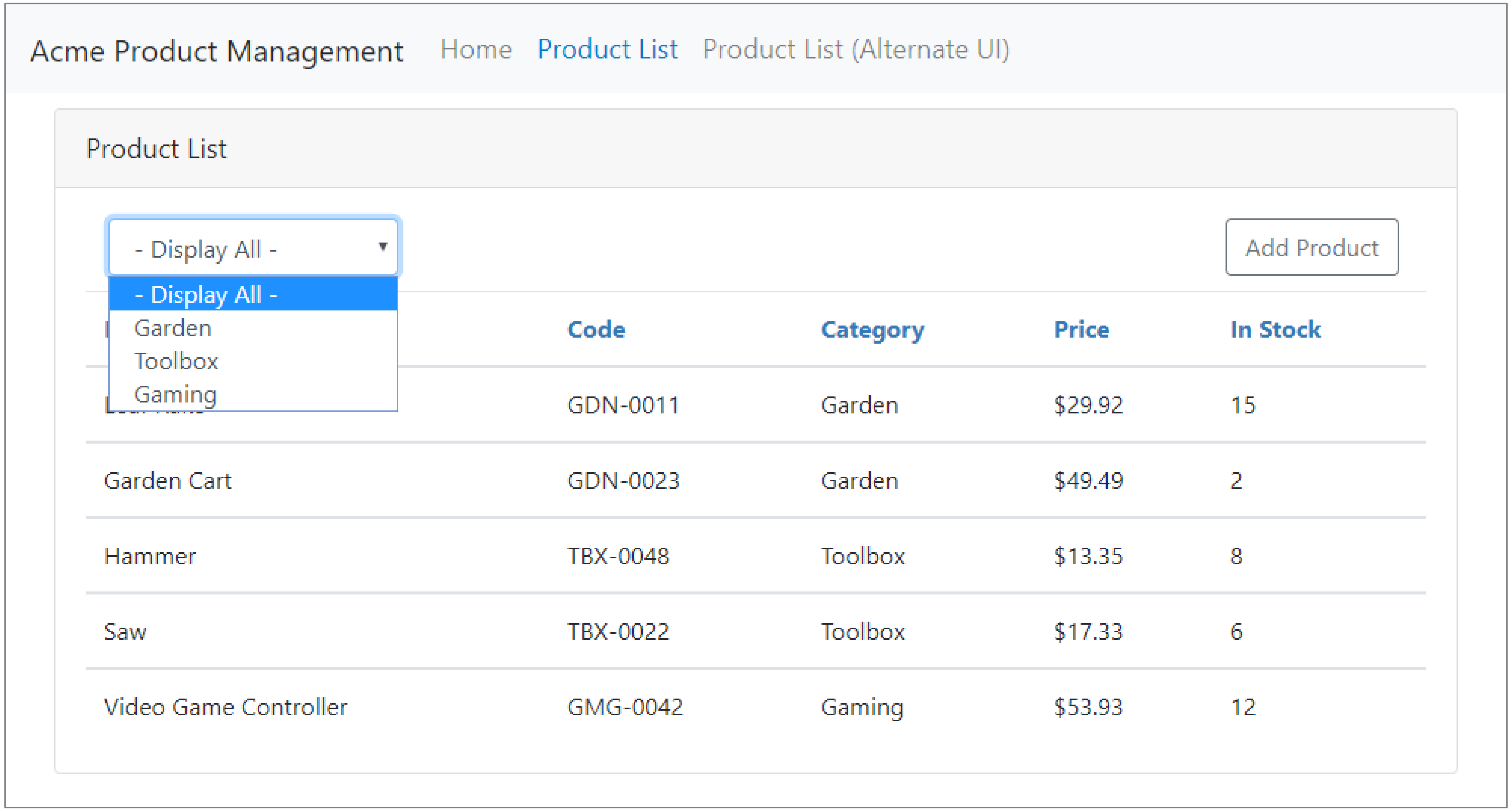
`filter`

`startWith`

`Subject`

`BehaviorSubject`

Filtering a Stream



Acme Product Management   Home   Product List   Product List (Alternate UI)

Product List

- Display All -

- Display All -
Garden
Toolbox
Gaming

Add Product

	Code	Category	Price	In Stock
[illegible]	GDN-0011	Garden	$29.92	15
Garden Cart	GDN-0023	Garden	$49.49	2
Hammer	TBX-0048	Toolbox	$13.35	8
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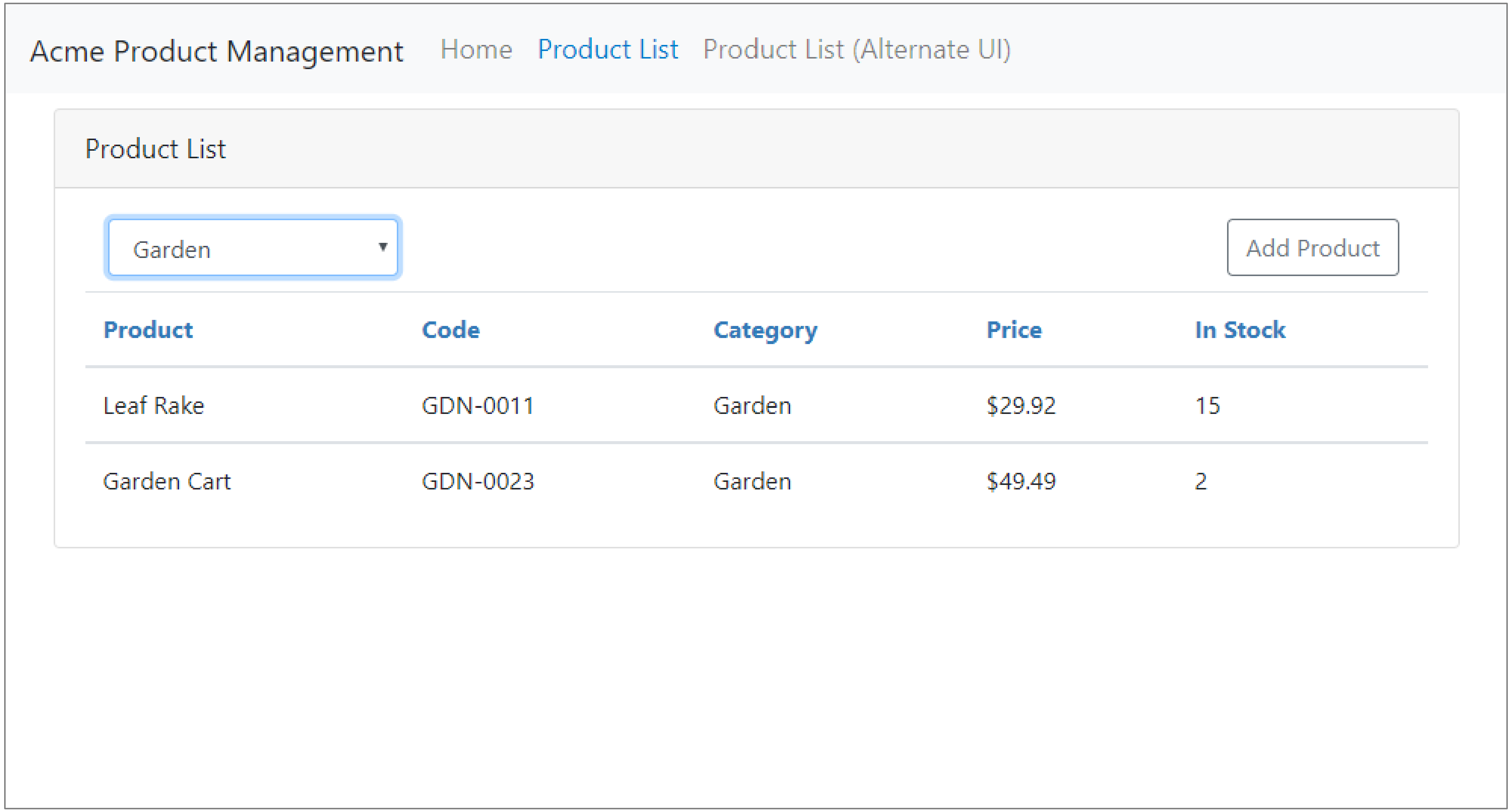
Filtering a Stream

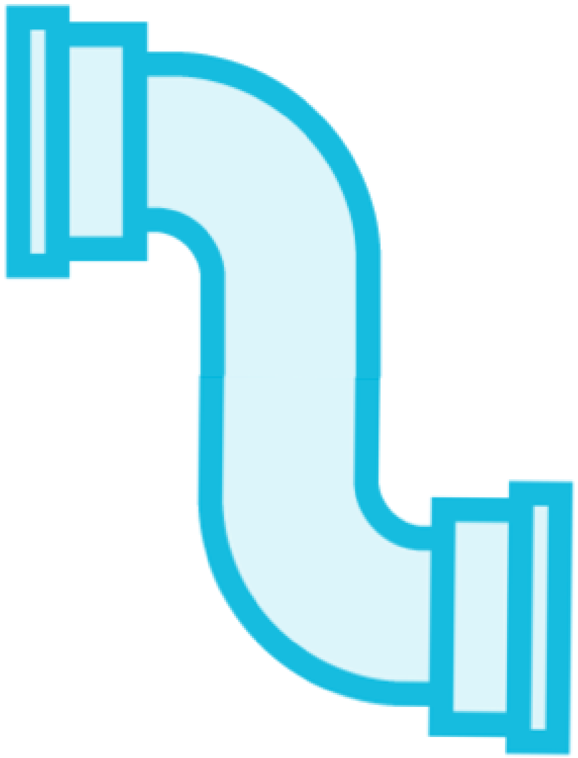


Product List

Garden

Product	Code	Category	Price	In Stock
Leaf Rake	GDN-0011	Garden	$29.92	15
Garden Cart	GDN-0023	Garden	$49.49	2

RxJS Operator: `filter`



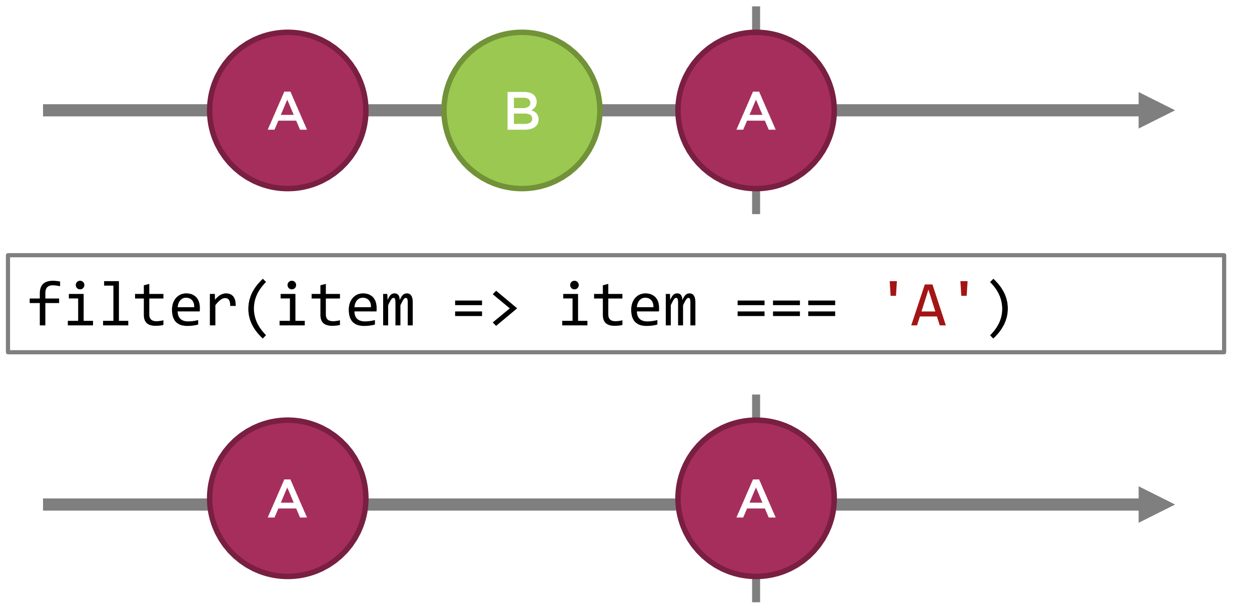
Filters to the items that match criteria specified in a provided function

```
filter(item => item === 'Apple')
```

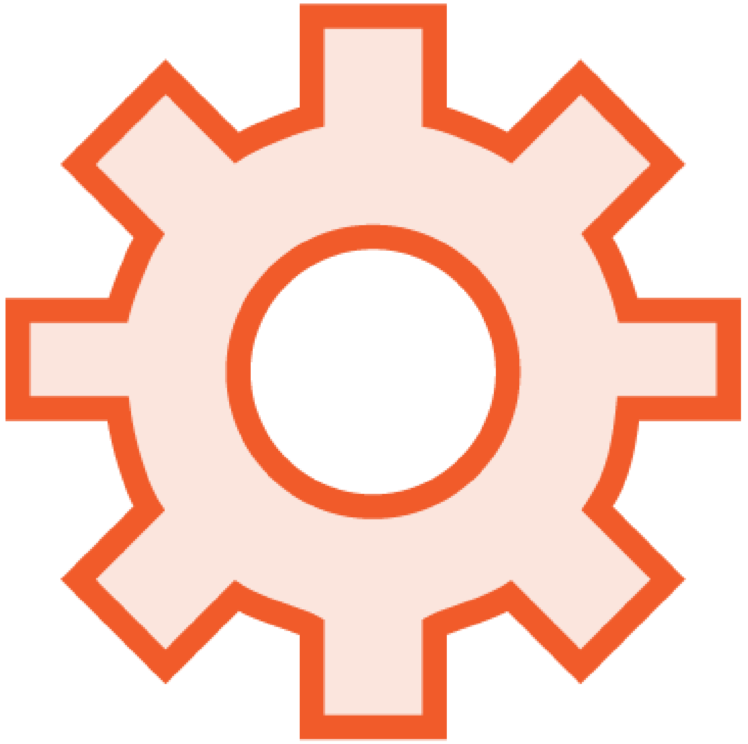
Similar to the array filter method

Marble Diagram: `filter`

```
of('A', 'B', 'A')
  .pipe(
    filter(item => item === 'A'),
  );
```



RxJS Operator: `filter`



`filter` is a transformation operator

- Takes in an input stream, subscribes
- Creates an output stream

When a source item is emitted

- Item is evaluated as specified by the provided function
- If the evaluation returns true, item is emitted to the output stream

Demo

Filtering a stream: Demo I

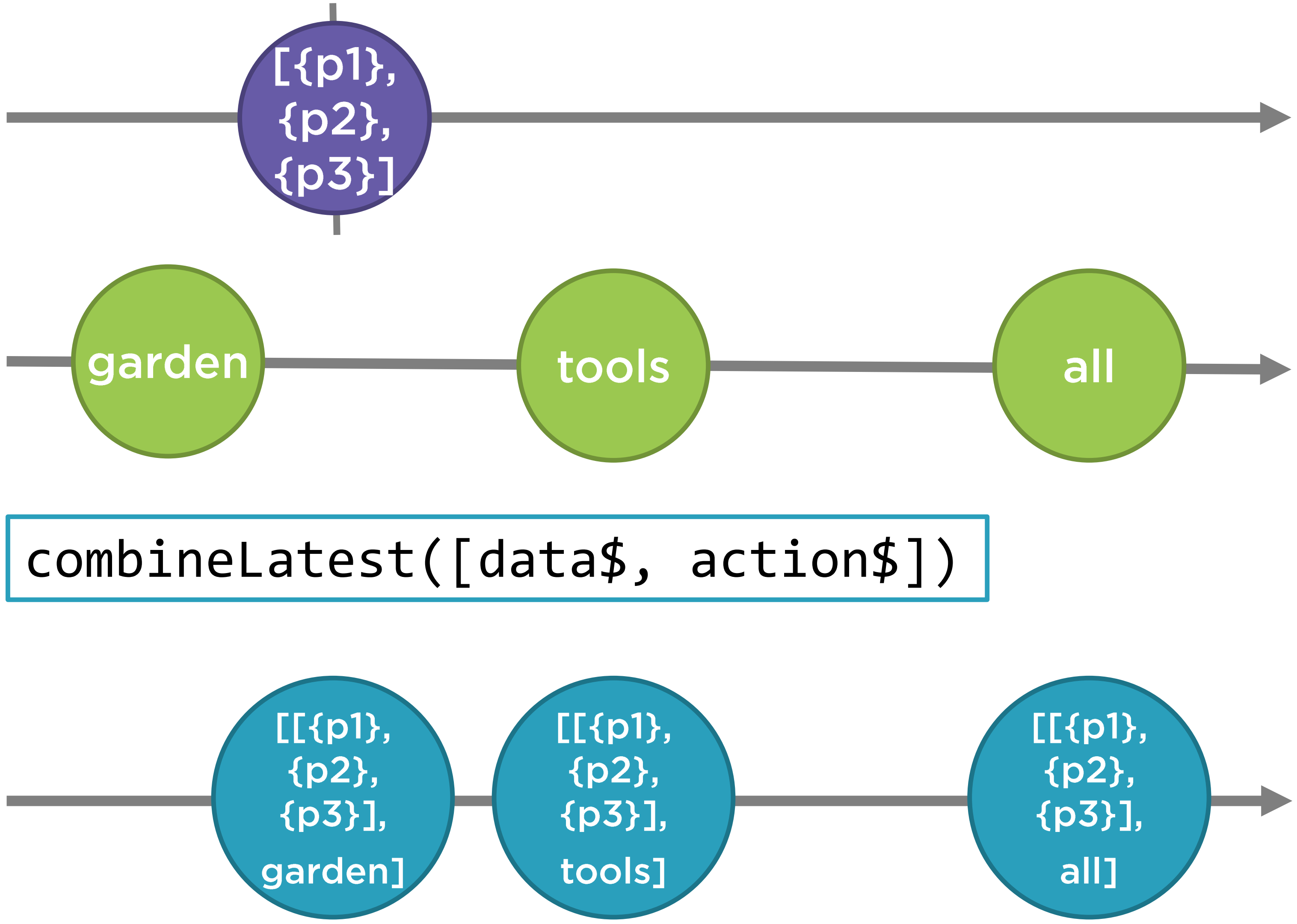
- Hard-coded category

Demo

Filtering a stream: Demo II

- Dropdown list of categories

Data Stream vs. Action Stream



[{p1}, {p2}, {p3}]
garden
tools
all
[[{p1}, {p2}, {p3}], garden]
[[{p1}, {p2}, {p3}], tools]
[[{p1}, {p2}, {p3}], all]

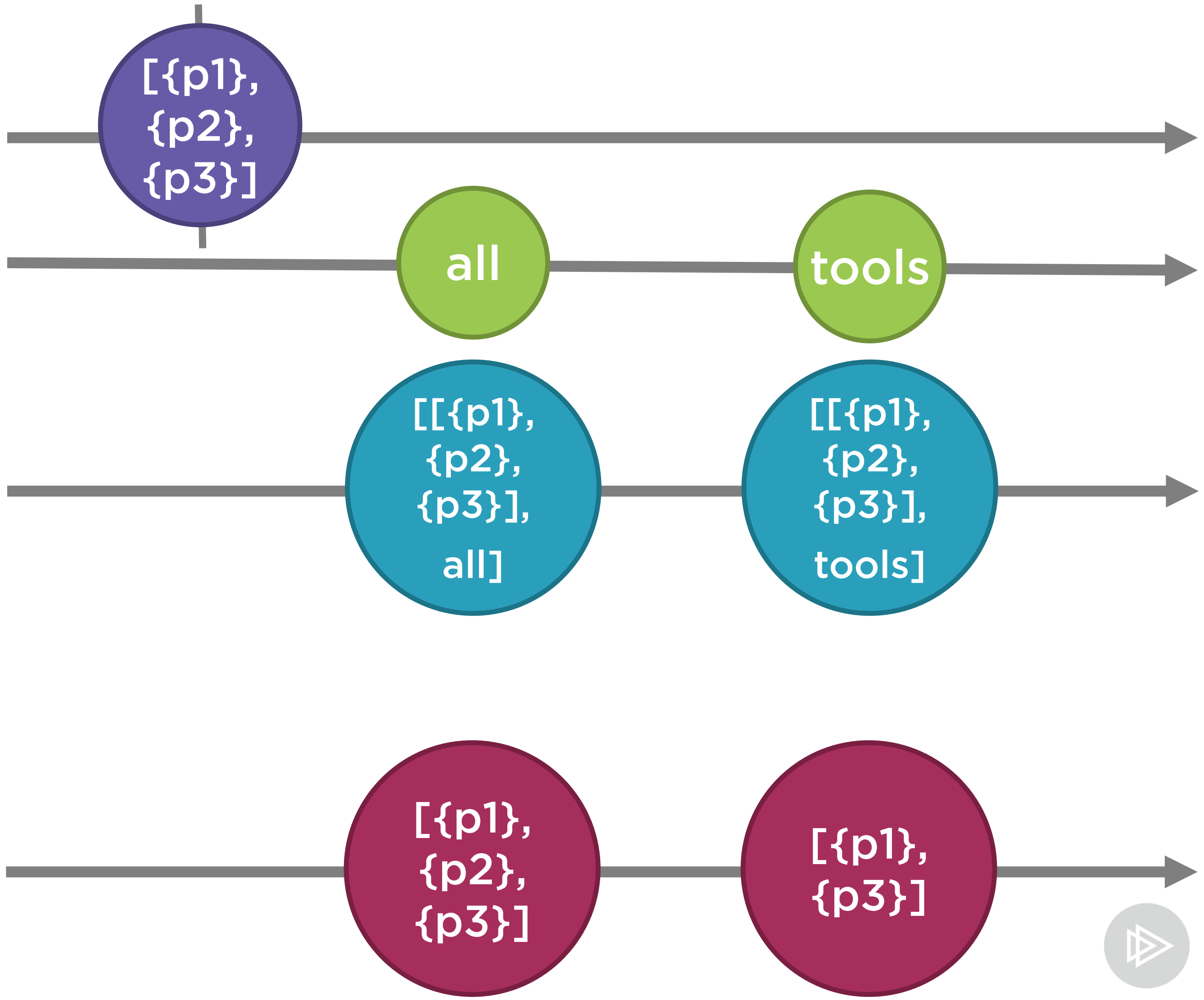
```
combineLatest([data$, action$])
```

Data Stream vs. Action Stream

```
products$ = combineLatest([
  this.productService.products$,
  this.action$



])
.pipe(
  map(([products, category]) =>
   products.filter(product =>
     product.category === category)
  )
);
```



Creating Streams

Data Stream

```
products$ = this.http.get<Product[]>(this.productsUrl)
```

Action Stream

```
action$ = ???
```

- Use a built-in stream
- `fromEvent`
- Subject/BehaviorSubject

Observable and Observer

Observable Stream

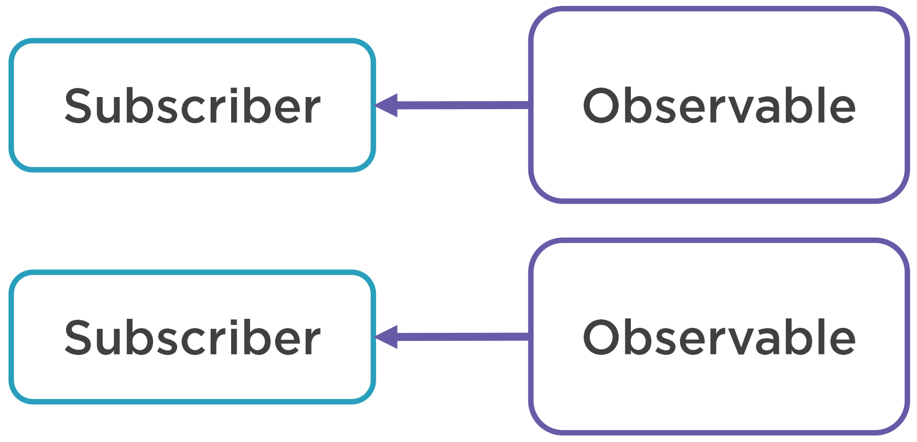
Observer:

next()

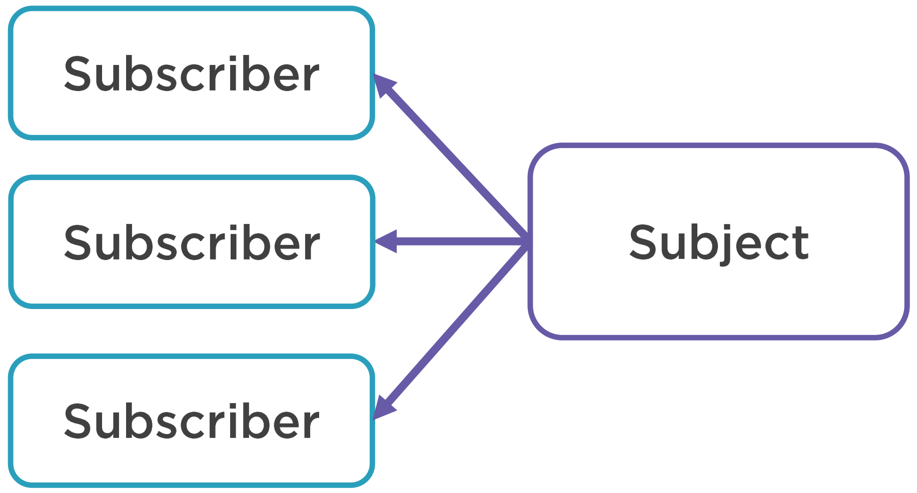
error()

complete()

Unicast vs. Multicast



Observable is unicast



Subject is multicast

Subject

```
private categorySelectedSubject = new Subject<number>();
categorySelectedAction$ = this.categorySelectedSubject.asObservable();
```

```
onSelected(categoryId): void {
  this.categorySelectedSubject.next(+categoryId);
}
```

```
products$ = combineLatest([
  this.productService.products$,
  this.categorySelectedAction$
])
.pipe(
  map(([products, categoryId]) =>
   products.filter(product =>
     categoryId ? product.categoryId === categoryId : true)
  )
);
```

BehaviorSubject

```
private categorySelectedSubject = new BehaviorSubject<number>(0);
categorySelectedAction$ = this.categorySelectedSubject.asObservable();
```

```
onSelected(categoryId): void {
  this.categorySelectedSubject.next(+categoryId);
}
```

```
products$ = combineLatest([
  this.productService.products$,
  this.categorySelectedAction$
])
.pipe(
  map(([products, categoryId]) =>
   products.filter(product =>
     categoryId ? product.categoryId === categoryId : true)
  )
);
```

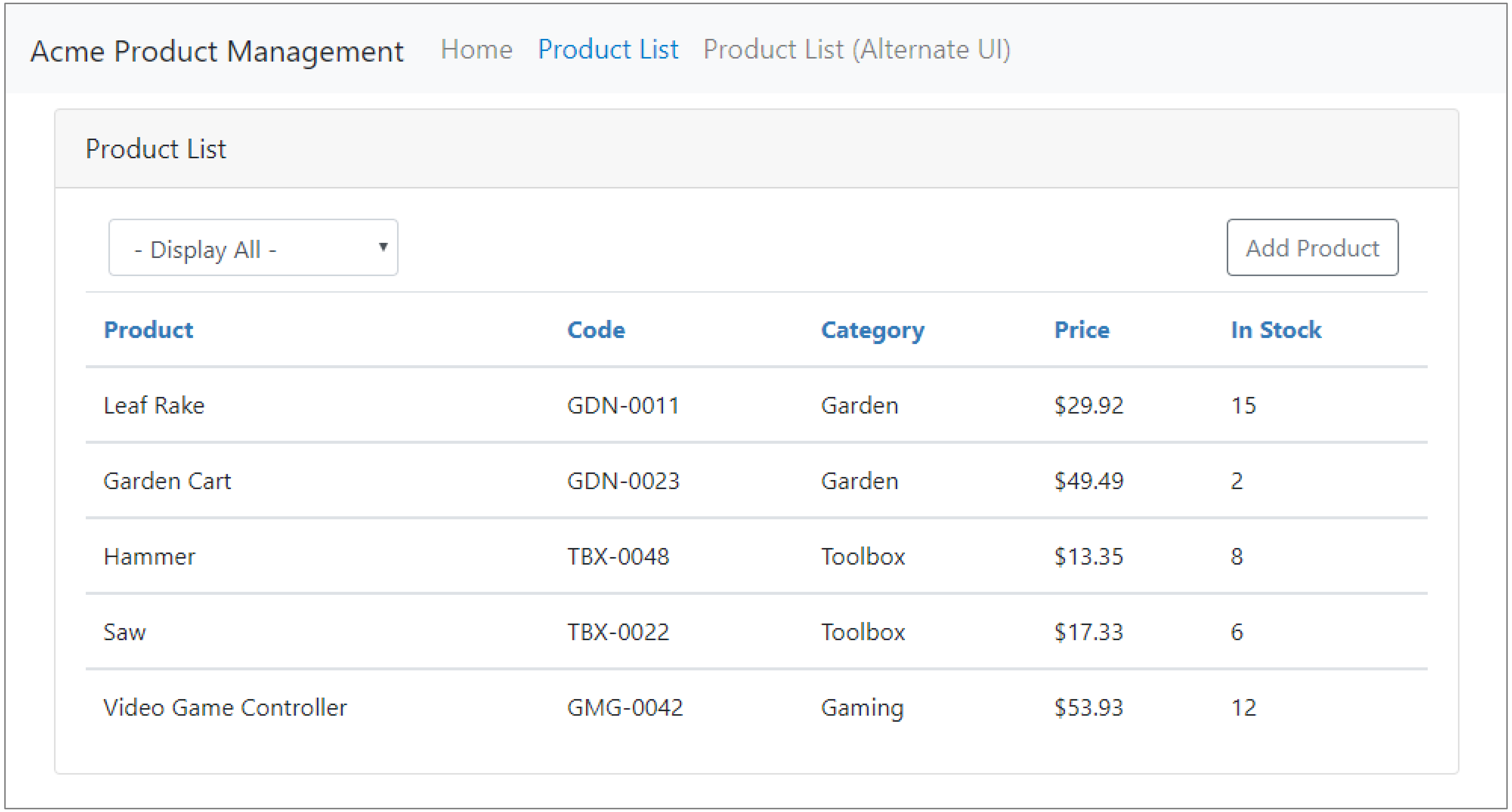
Reacting to Actions

Create an action stream (Subject/BehaviorSubject)

Combine the action stream and data stream

Emit a value to the action stream when an action occurs

Starting with an Initial Value



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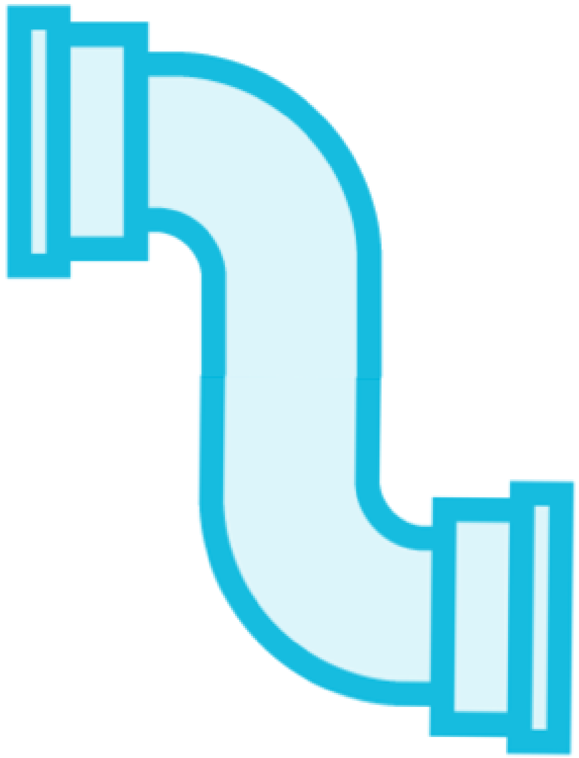
Starting with an Initial Value

```
this.categorySelectedAction$.pipe(startWith(0))
```

```
private categorySelectedSubject = new BehaviorSubject<number>(0);
categorySelectedAction$ = this.categorySelectedSubject.asObservable();
```

RxJS Operator: `startWith`

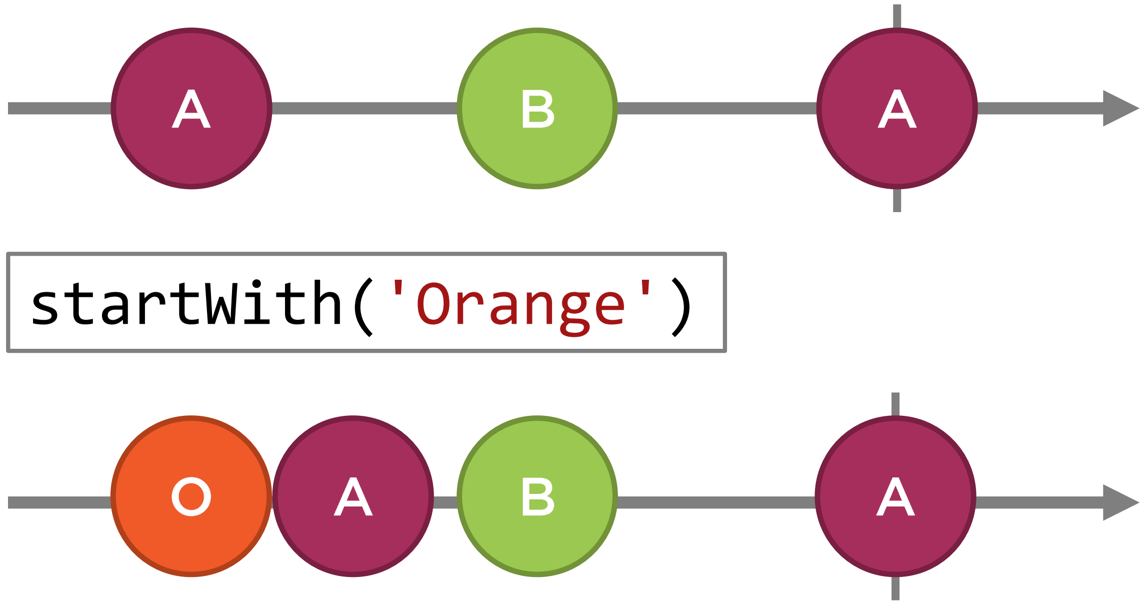


Provides an initial value

```
startWith('Orange')
```

Marble Diagram: `startWith`

```
of('A', 'B', 'A')
  .pipe(
    startWith('O'),
  );
```



RxJS Operator: `startWith`

`startWith` is a combination operator

- Takes in an input stream, subscribes
- Creates an output stream

When a source item is emitted

- If it's the first item, it emits the specified initial value(s), then …
- It emits the item to the output stream

Initial value(s) must be the same type as the input Observable

Reacting to Actions

Create an action stream (Subject/BehaviorSubject)

```
selSubject = new Subject<number>();
selectedAction$ = this.selSubject.asObservable();
```

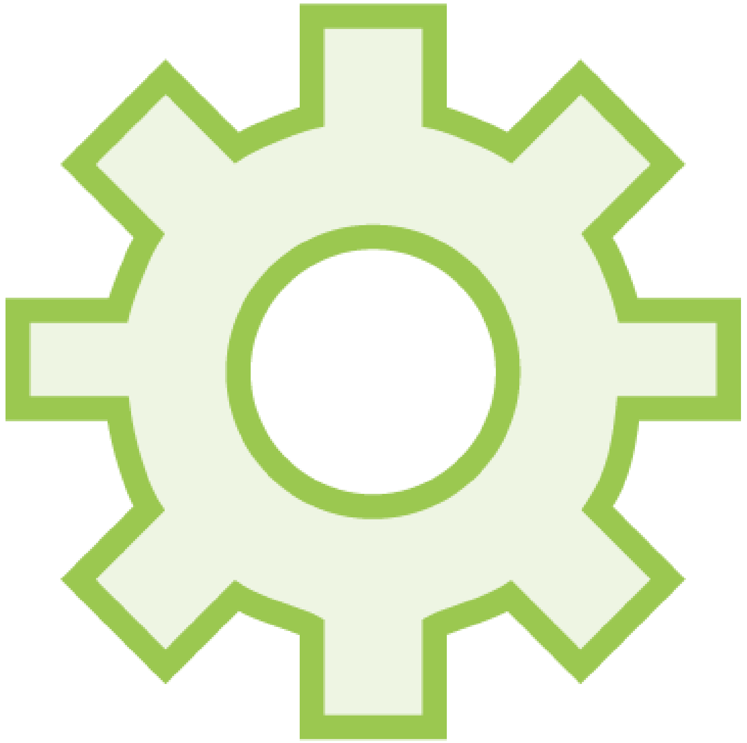
Combine the action and data streams

```
products$ = combineLatest([
  this.productService.products$,
  this.selectedAction$
]).pipe(...);
```

Emit a value to the action stream when an action occurs

```
onSelected(id): void {
  this.selSubject.next(+id);
}
```

RxJS Features



`filter`: **Only emits items that match criteria**

```
filter(item => item === 'Apple')
```

`startWith`: **Defines an initial value emitted before the input stream values**

```
startWith('Orange')
```

Subject/BehaviorSubject

Subject: **Special type of Observable that is both an Observable and an Observer**

```
selectedSubject = new Subject<number>();
```

BehaviorSubject: **Special type of Subject that emits an initial value**

```
selectedSubject = new BehaviorSubject<number>(0);
```