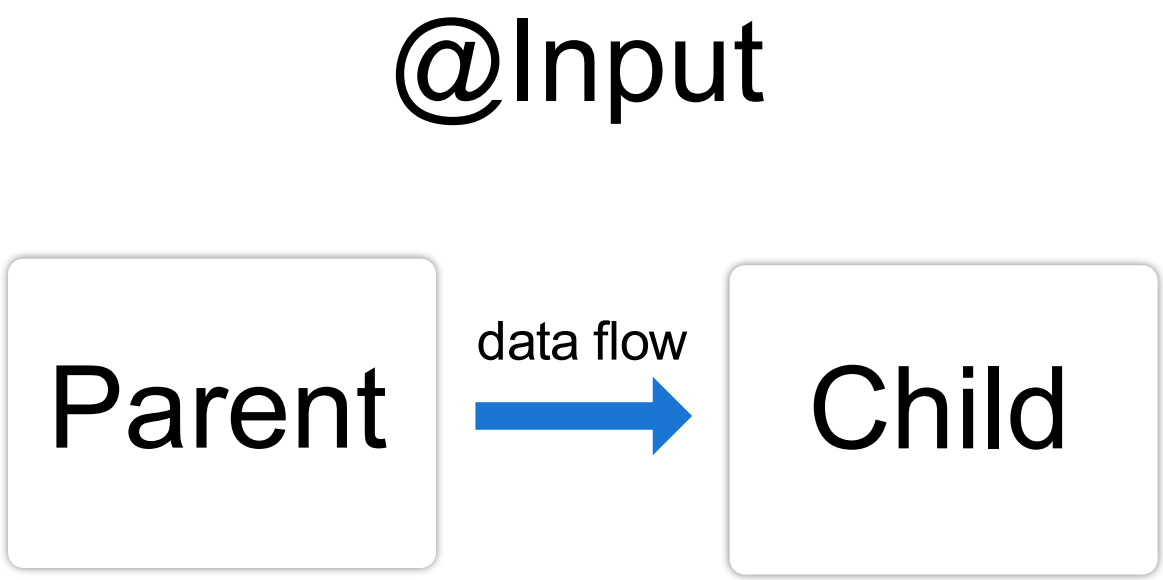
Sharing data between child and parent directives and components

- A common pattern in Angular is sharing data between a parent component and one or more child components. Implement this pattern with the @Input() and @Output() decorators.

@Input() and @Output() give a child component a way to communicate with its parent component. @Input() lets a parent component update data in the child component. Conversely, @Output() lets the child send data to a parent component.

Sending data to a child component

The @Input() decorator in a child component or directive signifies that the property can receive its value from its parent component.



To use @Input(), you must configure the parent and child.

Configuring the child component

To use the @Input() decorator in a child component class, first import Input and then decorate the property with @Input(), as in the following example.

src/app/item-detail.component.ts

```
content_copyimport { Component, Input } from '@angular/core'; // First, import Input

export class ItemDetailComponent {

  @Input() item = ''; // decorate the property with @Input()

}
```

In this case, @Input() decorates the property item, which has a type of string, however, @Input() properties can have any type, such as number, string, boolean, or object. The value for item comes from the parent component.

Next, in the child component template, add the following:

src/app/item-detail.component.html

```
content_copy<p>
  Today's item: {{item}}
</p>
```

Configuring the parent component

The next step is to bind the property in the parent component's template. In this example, the parent component template is app.component.html.

1. Use the child's selector, here <app-item-detail>, as a directive within the parent component template.
2. Use property binding to bind the item property in the child to the currentItem property of the parent.

src/app/app.component.html

```
content_copy<app-item-detail [item]="currentItem"></app-item-detail>
```

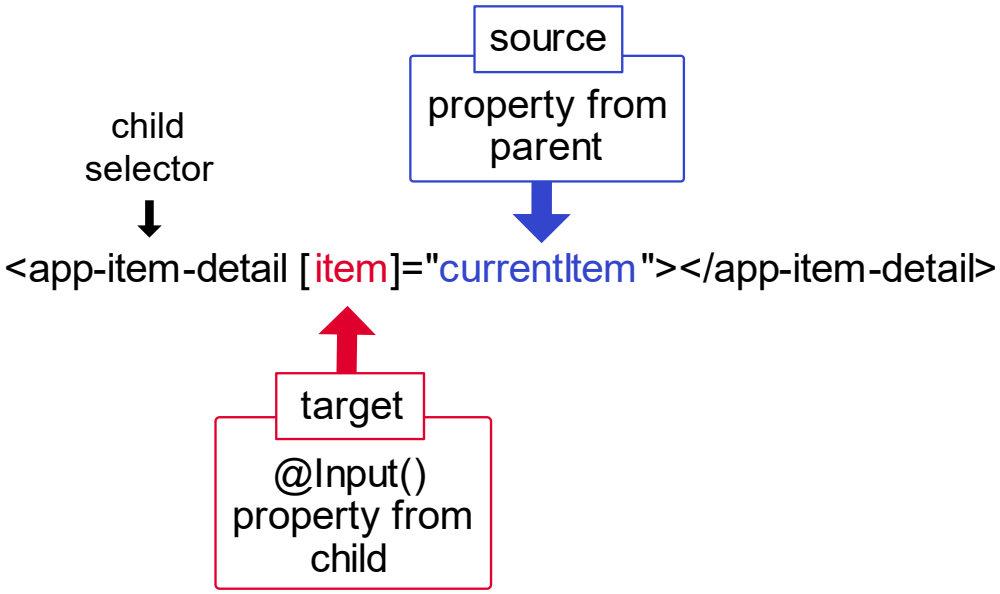
3. In the parent component class, designate a value for currentItem:

src/app/app.component.ts

```
content_copyexport class AppComponent {
  currentItem = 'Television';
}
```

With @Input(), Angular passes the value for currentItem to the child so that item renders as Television.

The following diagram shows this structure:



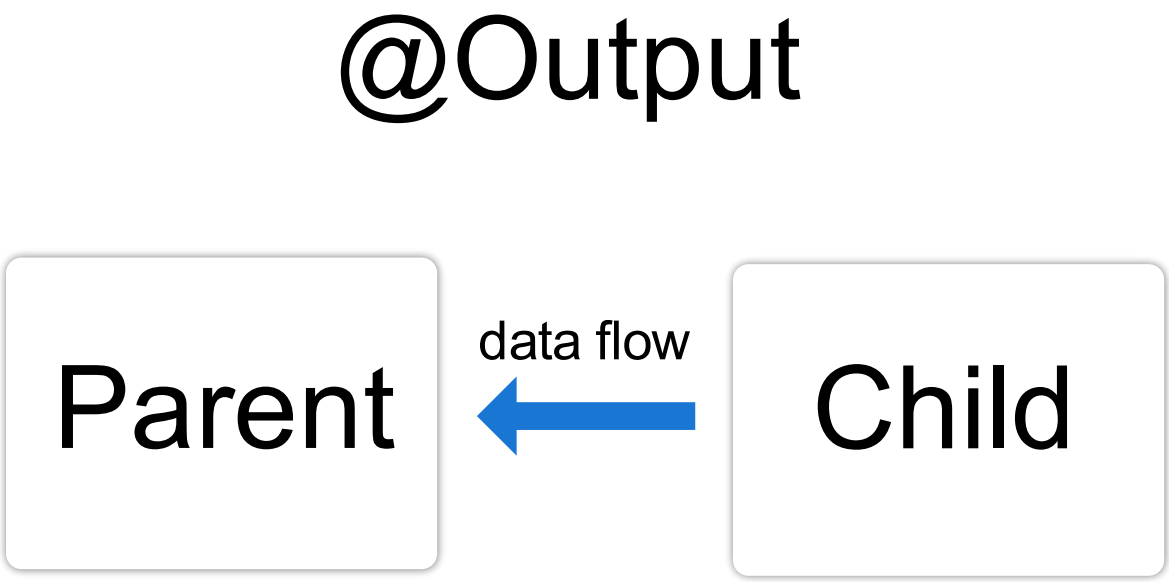
The target in the square brackets, [], is the property you decorate with @Input() in the child component. The binding source, the part to the right of the equal sign, is the data that the parent component passes to the nested component.

Watching for @Input() changes

To watch for changes on an @Input() property, use OnChanges, one of Angular's lifecycle hooks. See the OnChanges section of the Lifecycle Hooks guide for more details and examples.

Sending data to a parent component

The @Output() decorator in a child component or directive lets data flow from the child to the parent.



@Output() marks a property in a child component as a doorway through which data can travel from the child to the parent.

The child component uses the @Output() property to raise an event to notify the parent of the change. To raise an event, an @Output() must have the type of EventEmitter, which is a class in @angular/core that you use to emit custom events.

The following example shows how to set up an @Output() in a child component that pushes data from an HTML <input> to an array in the parent component.

To use @Output(), you must configure the parent and child.

Configuring the child component

The following example features an <input> where a user can enter a value and click a <button> that raises an event. The EventEmitter then relays the data to the parent component.

1. Import Output and EventEmitter in the child component class:

content_copyimport { Output, EventEmitter } from '@angular/core';

2. In the component class, decorate a property with @Output(). The following example newItemEvent @Output() has a type of EventEmitter, which means it's an event.

src/app/item-output.component.ts

content_copy@Output() newItemEvent = new EventEmitter<string>();

The different parts of the preceding declaration are as follows:

Declaration parts	Details
@Output()	A decorator function marking the property as a way for data to go from the child to the parent.
newItemEvent	The name of the @Output().
EventEmitter<string>	The @Output()'s type.
new EventEmitter<string>()	Tells Angular to create a new event emitter and that the data it emits is of type string.

For more information on EventEmitter, see the EventEmitter API documentation.

3. Create an addNewItem() method in the same component class:

src/app/item-output.component.ts

content_copyexport class ItemOutputComponent {

```
  @Output() newItemEvent = new EventEmitter<string>();

  addNewItem(value: string) {
    this.newItemEvent.emit(value);
  }
}
```

The addNewItem() function uses the @Output(), newItemEvent, to raise an event with the value the user types into the <input>.

Configuring the child's template

The child's template has two controls. The first is an HTML <input> with a template reference variable, #newItem, where the user types in an item name. The value property of the #newItem variable stores what the user types into the <input>.

src/app/item-output.component.html

content_copy<label for="item-input">Add an item:</label>

```
<input type="text" id="item-input" #newItem>
<button type="button" (click)="addNewItem(newItem.value)">Add to parent's list</button>
```

The second element is a <button> with a click event binding.

The (click) event is bound to the addNewItem() method in the child component class.
The addNewItem() method takes as its argument the value of the #newItem.value property.

Configuring the parent component

The AppComponent in this example features a list of items in an array and a method for adding more items to the array.

src/app/app.component.ts

content_copyexport class AppComponent {

```
  items = ['item1', 'item2', 'item3', 'item4'];


  addItem(newItem: string) {
    this.items.push(newItem);
  }
}
```

The addItem() method takes an argument in the form of a string and then adds that string to the items array.

Configuring the parent's template

1. In the parent's template, bind the parent's method to the child's event.
2. Put the child selector, here <app-item-output>, within the parent component's template, app.component.html.

src/app/app.component.html

content_copy<app-item-output (newItemEvent)="addItem($event)"></app-item-output>

The event binding, (newItemEvent)='addItem($event)', connects the event in the child, newItemEvent, to the method in the parent, addItem().

The $event contains the data that the user types into the <input> in the child template UI.

To see the @Output() working, add the following to the parent's template:

content_copy

```
  <li *ngFor="let item of items">{{item}}</li>
</ul>
```

The *ngFor iterates over the items in the items array. When you enter a value in the child's <input> and click the button, the child emits the event and the parent's addItem() method pushes the value to the items array and new item renders in the list.