Angular @input, @output & EventEmitter

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In this guide let us learn how to make use of `@input`, `@output` & `EventEmitter` in Angular. We use these decorators to pass data from parent to child component & vice versa. `@Input` defines the input property in the component, which the parent component can set. The `@output` defines the output property (event), which we raise in the child component using the `EventEmitter`. The parent listens to these events.

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@input, @output & Eventemitter

@input

Input decorator marks the property as the input property. I.e it can receive data from the parent component. The parent component uses the property binding to bind it to a component property. Whenever the value in the parent component changes angular updates the value in the child component.

Example

Consider the following component class

```
1
2  @Component({
3    selector: 'app-customer-detail',
4    templateUrl: './customer-detail.component.html',
5    styleUrls: ['./customer-detail.component.css']
6  })
7  export class CustomerDetailComponent implements OnInit {
8    @Input() customer:Customer;
9  }
10
```

We have Input decorator on the customer property. The component expects that the parent component will supply its value.

The parent component supplies the `customer` object using the property binding syntax. We add a square bracket around the `customer` property. Assign template expression (`selectedCustomer`) to it, which is a property in the parent component.

```
<app-customer-detail [customer]="selectedCustomer"></app-customer-detail>
```

@output

`Output` decorates the property as the output property. We initialize it as an `EventEmitter` . The child component raises the event and passes the data as the argument to the event. The parent component listens to events using event binding and reads the data.

Example

```
//Declare the property
@Output() customerChange:EventEmitter<Customer> =new EventEmitter<Customer>();

//Raise the event to send the data back to parent
update() {
  this.customerChange.emit(this.customer);
}
```

The `customerChange` is the Output property and is of type `EventEmitter` .

In the parent component, we subscribe to the event using the event binding syntax. Use the `()` around the event name (`customerChange`) and assign a template statement (`update($event)`) to it. It receives the data in the `$event` argument.

```
<app-customer-detail [customer]="selectedCustomer" (customerChange)="update($event)"
```

Remember you must use the argument name as `$event`.

EventEmitter

`EventEmitter` is responsible for raising the event. The `@output` property normally is of type `EventEmitter`. The child component will use the `emit()` method to emit an event along with the data.

```
//Define  output property
@Output() customerChange:EventEmitter<Customer> =new EventEmitter<Customer>();

//Raise the event using the emit method.
update() {
  this.customerChange.emit(this.customer);
}
```

Now let us build an app to learn how to use `Input`, `output` & `EventEmitter`

@input, @output & Eventemitter Example

The app we build has two components. The parent component shows a list of customers. The user has the option to click on the edit button, which results in a child component displaying the customer form Once the user updates the records, the child component raises the event. The parent captures the event. The parent then updates the list with the new data.

Create a new application using the following command

```

ng new InputOutputExample


cd InputOutputExample

```

Create the customerList & customerDetail components. Also, create the customer class

```

ng g c customerList
ng g c customerDetail
ng g class customer

```

Customer

```

export class Customer {

  customerNo: number=0;
  name: string="";
  address: string="";
  city: string="";
  state: string="";
  country: string="";

}

```

app.module.ts

The `ngModel` needs the `FormsModule`. Hence import it and add it in import metadata.

```
1
2  import { BrowserModule } from '@angular/platform-browser';
3  import { NgModule } from '@angular/core';
4  import { FormsModule } from '@angular/forms'
5
6  import { AppRoutingModule } from './app-routing.module';
7  import { AppComponent } from './app.component';
8  import { CustomerListComponent } from './customer-list/customer-list.component';
9  import { CustomerDetailComponent } from './customer-detail/customer-detail.component';
10
11 @NgModule({
12   declarations: [
13     AppComponent,
14     CustomerListComponent,
15     CustomerDetailComponent
16   ],
17   imports: [
18     BrowserModule,
19     AppRoutingModule,
20     FormsModule
21   ],
22   providers: [],
23   bootstrap: [AppComponent],
24 })
25 export class AppModule { }
26
27
```

Child Component

The child component gets an instance of the customer in its input property `customer`.

The parent needs to set it using the property binding

Users can edit the customer. Once finished they will click the update button. The update method raises the `customerChange` event. We pass the `customer` as the argument to the event. The parent component listens to the event and receives the data.

The following is the complete code of the `CustomerDetailComponent`.

```
1
2  import { Component, OnInit, Input, Output,EventEmitter } from '@angular/core';
3  import { Customer } from '../customer';
4
5  @Component({
6    selector: 'app-customer-detail',
7    templateUrl: './customer-detail.component.html',
8    styleUrls: ['./customer-detail.component.css']
9  })
10 export class CustomerDetailComponent implements OnInit {
11
12   @Input() customer:Customer = new Customer();
13   @Output() customerChange:EventEmitter<Customer> =new EventEmitter<Customer>()
14
15   constructor() { }
16
17   ngOnInit() {
18   }
19
20   update() {
21     this.customerChange.emit(this.customer);
22   }
23
24 }
25
```

'app-customer-detail' is the name of the selector for this component.

The `customer` property is the input property decorated with `Input`.

```
@Input() customer:Customer = new Customer();
```

`customerChange` is decorated as the `output` property of type `EventEmitter`

```
@Output() customerChange:EventEmitter<Customer> =new EventEmitter<Customer>();
```

Whenever the user updates the `customer`, we raise the event `customerChange`. We pass the updated `customer` as the argument to it.

```
update() {
  this.customerChange.emit(this.customer);
}
```

The `customer-detail.component.html` is as follows.

```
<p>Customer No : {{customer.customerNo}}</p>
<p>Name        : <input [(ngModel)]="customer.name"></p>
<p>Address     : <input [(ngModel)]="customer.address"></p>
<p>city      : <input [(ngModel)]="customer.city"></p>
<p>state     : <input [(ngModel)]="customer.state"></p>
<p>country     : <input [(ngModel)]="customer.country"></p>

<button (click)="update()">Update</button>
```

The ngModel binds the `customer` to the input element. It is a two-way binding. The `click` event of the button is bound to `update()` method in the component.

Parent Component

The job of the parent component is to display a list of customers. When the user clicks on the edit button pass the selected customer to the child component. Then wait for the `customerChange` event. Update the customer's list on receipt of data from the child.

The following is the `customer-list.component.html`

```
<h2>List of Customers</h2>

<table class='table'>
  <thead>
    <tr>
      <th>No</th>
      <th>Name</th>
      <th>Address</th>
      <th>City</th>
      <th>State</th>
      <th>Country</th>
      <th>Edit</th>
    </tr>
  </thead>
  <tbody>
    <tr *ngFor="let customer of customers;">
      <td>{{customer.customerNo}}</td>
      <td>{{customer.name}}</td>
      <td>{{customer.address}}</td>
      <td>{{customer.city}}</td>
```

```
22      <td>{{customer.state}}</td>
23      <td>{{customer.country}}</td>
24      <td><button (click)="showDetails(customer)">Edit</button></td>
25    </tr>
26  </tbody>
27 </table>
28
29 <h3>Details</h3>
30 <app-customer-detail [customer]="selectedCustomer" (customerChange)="update($event
31
```

Use the ngFor directive to loop through the customer list and display the customer details.

```
1
2 <tr *ngFor="let customer of customers;">
3
```

The event binding to capture the `click` event. We pass the customer object to the `showDetails` method

```
1
2 <td><button (click)="showDetails(customer)">Edit</button></td>
3
```

`app-customer-detail` is the selector for the `CustomerDetailComponent`. We use the property binding to send the `selectedCustomer` to the child component. The child component raises the `customerChange` event, which we listen to using the event binding and call the `update` method.

Customer-list.component.ts

The component code of the parent component. It has two method showDetails & update

```
import { Component, OnInit } from '@angular/core';
import { Customer } from '../customer';
import { element } from 'protractor';
import { ObjectUnsubscribedError } from 'rxjs';

@Component({
  selector: 'app-customer-list',
  templateUrl: './customer-list.component.html',
  styleUrls: ['./customer-list.component.css']
})
export class CustomerListComponent implements OnInit {

  customers: Customer[] = [

    {customerNo: 1, name: 'Rahuld Dravid', address: '', city: 'Banglaore', state: 'Karnataka',
    {customerNo: 2, name: 'Sachin Tendulkar', address: '', city: 'Mumbai', state: 'Maharastr
    {customerNo: 3, name: 'Saurrav Ganguly', address: '', city: 'Kolkata', state: 'West Beng
    {customerNo: 4, name: 'Mahendra Singh Dhoni', address: '', city: 'Ranchi', state: 'Bihar'
    {customerNo: 5, name: 'Virat Kohli', address: '', city: 'Delhi', state: 'Delhi', country: 'Ind

  ]

  selectedCustomer:Customer = new Customer();

  constructor() { }

  ngOnInit() {
  }

  showDetails(customer:Customer) {
    this.selectedCustomer=Object.assign({},customer)
  }

  update(customer:Customer) {
    console.log(customer)
    var cust=this.customers.find(e => e.customerNo==customer.customerNo)
    Object.assign(cust,customer)
    alert("Customer Saved")
  }
}

```

The `showDetails` method gets the customer as its argument. We clone it & assign it to `selectedCustomer`

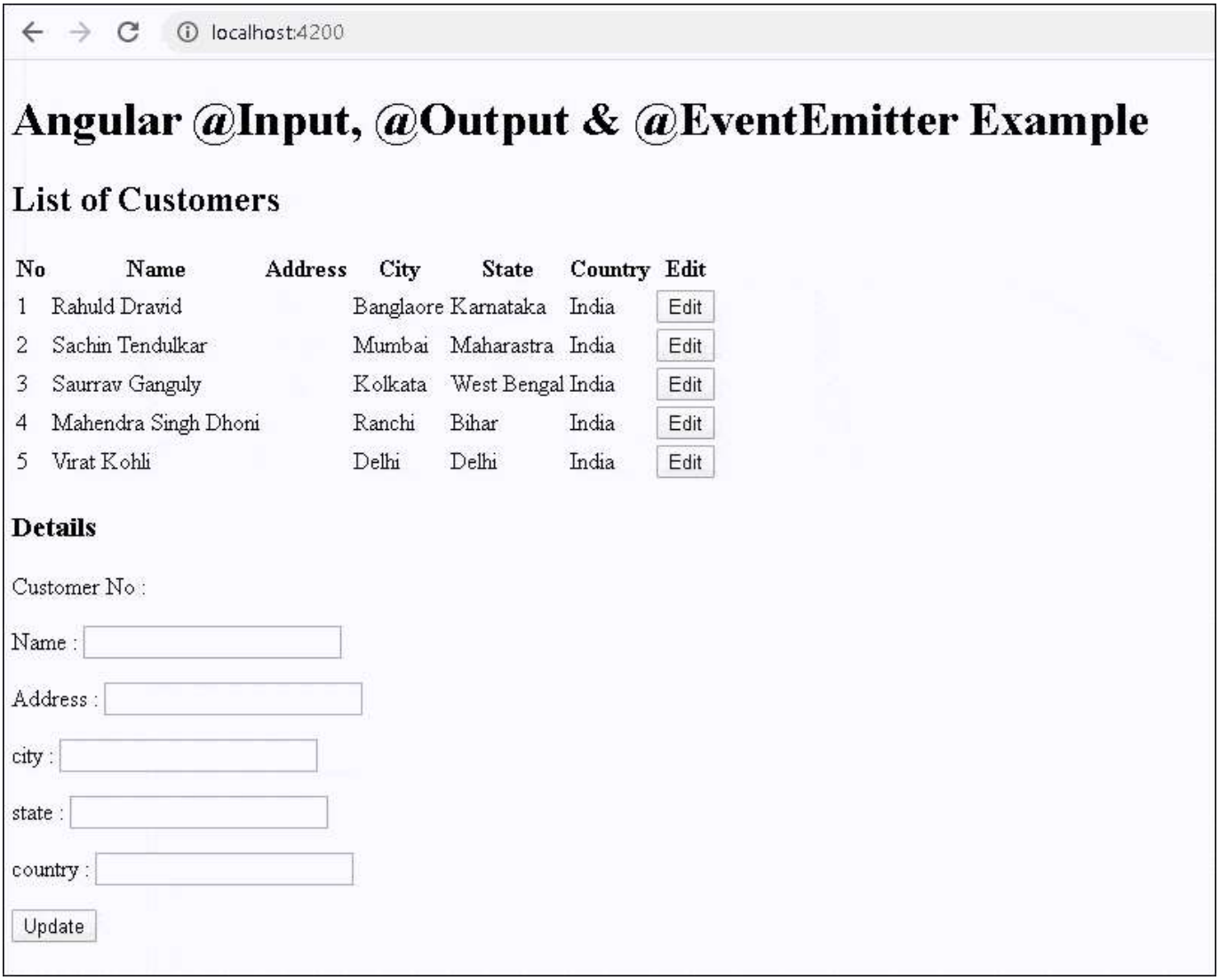
Since the customer is an object it is **Passed by Reference** . When you make any modification to the `customer` it will also be reflected in the customer's collection. We want the update the customer's only when we get the data from the child. Hence we clone the customer and send it to the child component.

If you are passing primitive data types like numbers are **Passed by Value** .

Finally in the root component (i.e. `app.component.html`) copy the following

```
1
2 <app-customer-list></app-customer-list>
3
```

Run the app



Notes on @Input & @Output

You can also pass the optional name

Input decorator allows us to pass an option name, which you can use it while binding in the parent

For Example

```
1
2 @Input('customerData') customer:Customer;
3
```

Intercept input property changes with a setter

You can also create a setter property

```
private _customerData = '';
@Input()
set customer(customer: Customer) {
  //You can add some custom logic here
  this._customerData = customer;
  console.log(this._customerData)
}
get customer(): string { return this._customerData; }
```

Subscribe to @Input changes using ngChanges

You can also subscribe to the changes using ngOnChanges life cycle hook.

EventEmitters are observable

EventEmitters are RxJs Subjects. Hence you can make use of RxJs operators to manipulate them. Read more about it from this link.

Pass by reference

The objects are passed by reference. Hence if you modify the object, you are updating the original object. The primitive data types like numbers are **Passed by Value**.

References

- https://angular.io/api/core/Input
- https://angular.io/api/core/Output
- https://angular.io/api/core/EventEmitter
- https://angular.io/guide/component-interaction