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# Angular 2 Http get() Parameters + Headers + URLSearchParams + RequestOptions Example

By Arvind Rai, May 19, 2017

This page will walk through Angular 2 Http get() parameters + Headers + URLSearchParams + RequestOptions example. Angular `Headers` class is used to create headers. Angular `URLSearchParams` class is used to create URL parameters. Angular `RequestOptions` instantiates itself using instances of `Headers`, `URLSearchParams` and other request options such as url, method, search, body, withCredentials, responseType. These classes are imported from `@angular/http` API. Finally `Http.get()` uses instance of `RequestOptions` to interact with the server. Though `RequestOptions` is optional to use with `Http.get()`, but to send request headers or query/search parameters in the URL, we need to use them. On this page we will create an application that will use `Http.get()` to send headers and parameters using angular in-memory web API. Find the code snippet from our example.

```
getBookById(bookId: string): Observable<Book[]> {
    let myHeaders = new Headers();
    myHeaders.append('Content-Type', 'application/json');
    let myParams = new URLSearchParams();
    myParams.append('id', bookId);
    let options = new RequestOptions({ headers: myHeaders, params: myParams });
    return this.http.get(this.url, options)
        .map(this.extractData)
        .catch(this.handleError);
}
```

Using `set()` or `append()` method of `URLSearchParams` and `Headers`, we can add multiple parameters and headers, too. Now we will walk through complete example step by step.

**Contents**

## Technologies Used

Find the technologies being used in our example.
1. Angular 4.0.0
2. TypeScript 2.2.0
3. Node.js 6.10.1
4. Angular CLI 1.0.0
5. Angular Compiler CLI 4.0.0

## Headers

`Headers` is the angular class that is used to configure request headers. Find the sample `Headers` instantiation.

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```
let myHeaders = new Headers();
```

We can also pass headers as an argument while instantiating `Headers` class. Find the code snippet.

```
let myHeaders = new Headers({ 'Content-Type': 'application/json', 'Cache-Control': 'no-cache' });
```

To fetch, add and delete headers, `Headers` class has following methods.
**append(name: string, value: string)**: Appends a header to existing list of header values for a given header name. We use `append()` as follows.

```
myHeaders.append('Accept', 'text/plain');
myHeaders.append('Accept', ' application/xhtml+xml ');
```

Now the `Accept` header will have the following values.

```
Accept: text/plain, application/xhtml+xml
```

**set(name: string, value: string|string[])**: Sets or overrides header value for given name. It is used as follows.

```
myHeaders.set('Accept', ' application/xml ');
```

Now the `Accept` header will have only the following value.

```
Accept: application/xml
```

**delete(name: string)**: Deletes all header values for the given name. We use it as follows.

```
myHeaders.delete('Accept');
```

**get(name: string) : string**: Returns first header that matches given name. Find the code snippet.

```
let acceptHeader =  myHeaders.get('Accept');
```

**getAll(name: string) : string[]**: Returns list of header values for a given name.

```
let acceptHeaders =  myHeaders.getAll ('Accept');
```

If we want to add multiple headers, we can achieve it by `set()` method as follows.

```
myHeaders.set('Content-Type', 'application/json');
myHeaders.set('Accept', 'text/plain');
```

If we want to add multiple headers by `append()` method, we can achieve it as follows.

```
myHeaders.append('Content-Type', 'application/json');
myHeaders.append('Accept', 'text/plain');
```

## URLSearchParams

`URLSearchParams` creates the query string in the URL. It is a map-like representation of URL search parameters. Find its constructor syntax.

```
constructor(rawParams?: string, queryEncoder?: QueryEncoder)
```

Both arguments in the constructor are optional. Angular `queryEncoder` parameter is used to pass any custom `QueryEncoder` to encode key and value of the query string. By default `QueryEncoder` encodes keys and values of parameter using JavaScript `encodeURIComponent()` method.
Now we can instantiate `URLSearchParams` as given below.

```
let myParams = new URLSearchParams();
```

Now we can fetch, add and delete parameters using following methods.
**append(param: string, val: string) : void**: Appends parameter value to existing list of parameter values for a given parameter name. It is used to add values in multi-value fields or arrays in query string. If we write the code as given below.

```
myParams.append('names', 'John');
myParams.append('names', 'David');
```

Then query parameter `names` will be an array. The query string will look like as given below.

```
?names[]=John&names[]=David
```

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Server side code such as PHP will get `names` parameter value as an array.

**set(param: string, val: string)**: Sets or overrides parameter value for given parameter name. We can use as follows.

```
myParams.set('names', 'Bob');
```

The query string will be as follows.

```
?names=Bob
```

**delete(param: string) : void**: Deletes all parameter values for the given parameter name. Find the code snippet.

```
myParams.delete('names');
```

**get(param: string) : string**: In case of multi-value fields, it returns the first value for given parameter name. Find the code snippet.

```
let nameParam = myParams.get('names');
```

**getAll(param: string) : string[]**: Returns list of values for a given parameter name. Find the code snippet.

```
let namesParam = myParams.getAll('names');
```

If we want to add multiple parameters, we can achieve it by `set()` method as follows.

```
myParams.set('category', catg);
myParams.set('writer', wtr);
```

If we want to add multiple parameters by `append()` method, we can achieve it as follows.

```
myParams.append('category', catg);
myParams.append('writer', wtr);
```

## RequestOptionsArgs and RequestOptions

`RequestOptionsArgs` is an interface that is used to construct a `RequestOptions`. The fields of `RequestOptionsArgs` are url, method, search, params, headers, body, withCredentials, responseType.

`RequestOptions` is used to create request option. It is instantiated using `RequestOptionsArgs`. It contains all the fields of the `RequestOptionsArgs` interface. Now find the constructor of `RequestOptions` class.

```
constructor({method, headers, body, url, search, params,
                 withCredentials, responseType}?: RequestOptionsArgs)
```

In our example we will use following fields.

**headers** : Sets headers for HTTP request. It is of `Headers` class type.

**params**: Sets query parameters in the URL. It is of `URLSearchParams` class type.

Now if we have instance of `Headers` as follows.

```
let myHeaders = new Headers();
myHeaders.append('Content-Type', 'application/json');
```

And instance of `URLSearchParams` as follows.

```
let myParams = new URLSearchParams();
myParams.append('id', bookId);
```

Then `headers` and `params` can be passed to `RequestOptions` as given below.

```
let options = new RequestOptions({ headers: myHeaders, params: myParams });
```

## Http.get() with Multiple Headers and Multiple Parameters

Angular `Http.get()` method performs a request with HTTP GET method. Find the arguments of `Http.get()` method.

```
get(url: string, options?: RequestOptionsArgs) : Observable<Response>
```

**url**: This is the HTTP URL to hit the server using HTTP GET method.

**RequestOptionsArgs**: This is optional in `Http.get()` method. This is used to create instance of `RequestOptions` to send headers, parameters etc with `Http.get()` method.

Now If we want to add multiple headers, we can do as follows.

```
let myHeaders = new Headers();
myHeaders.set('Content-Type', 'application/json');
myHeaders.set('Accept', 'text/plain');
```

If we want to add multiple parameters, we can do as follows.

```
let myParams = new URLSearchParams();
myParams.set('category', catg);
myParams.set('writer', wtr);
```

Find the code snippet for `Http.get()` with multiple headers and multiple URL parameters.

```
getBooksAfterFilter(catg: string, wtr: string): Observable<Book[]> {
  let myHeaders = new Headers();
  myHeaders.set('Content-Type', 'application/json');
  myHeaders.set('Accept', 'text/plain');
  let myParams = new URLSearchParams();
  myParams.set('category', catg);
  myParams.set('writer', wtr);
  let options = new RequestOptions({ headers: myHeaders, params: myParams });
  return this.http.get(this.url, options)
        .map(this.extractData)
        .catch(this.handleError);
}
```

## Angular In-Memory Web API

Angular provides in-memory web API to process HTTP request in test environment. In case we don't have actual server URL, we can use angular in-memory web API for testing our angular `Http` methods. It provides a dummy URL which can be changed by actual URL later. It returns an `Observable` of HTTP `Response` object in the manner of a RESTy web api. In our example we are using in-memory web API to get and post data. To use it in our angular application we need to follow below steps.

**Step-1**: Add `angular-in-memory-web-api` in **dependencies** block in `package.json` file as given below.

```
"angular-in-memory-web-api": "~0.3.0"
```

**Step-2**: Run **npm install** command to download `angular-in-memory-web-api`.

**Step-3**: Create a class implementing `InMemoryDbService` interface. In our example we are creating an in-memory DB for books. Find our class for our in-memory DB.

**book-data.ts**

```
import { InMemoryDbService } from 'angular-in-memory-web-api';

export class BookData implements InMemoryDbService {
  createDb() {
    let books = [
      { id: '1', name: 'Angular 2 by Krishna', category: 'Angular', writer: 'Krishna' },
      { id: '2', name: 'AngularJS by Krishna', category: 'Angular', writer: 'Krishna' },
      { id: '3', name: 'Angular 2 by Vishnu', category: 'Angular', writer: 'Vishnu' },
      { id: '4', name: 'Core Java by Vishnu', category: 'Java', writer: 'Vishnu' },
      { id: '5', name: 'JSP & Servlet by Vishnu', category: 'Java', writer: 'Vishnu' },
      { id: '6', name: 'JPA by Vishnu', category: 'Java', writer: 'Vishnu' },
      { id: '7', name: 'Hibernate by Krishna', category: 'Hibernate', writer: 'Krishna' }
    ];
    return {books};
  }
}
```

To interact with DB, URL will be **api/books** .

**Step-4**: Before using DB we need to configure our above class in application module using `imports` metadata of `@NgModule` as follows.

```
InMemoryWebApiModule.forRoot(BookData)
```

Find the application module.

```
import { InMemoryWebApiModule } from 'angular-in-memory-web-api';
import { BookData } from './book-data';

@NgModule({
---------
  imports: [
        BrowserModule,
        HttpModule,
        InMemoryWebApiModule.forRoot(BookData)
  ]
---------
})
```

Find the link for more information on in-memory web API.

## Complete Example

Find the complete example.

**book.service.ts**

```
import { Injectable } from '@angular/core';
import { Http, Response, Headers, URLSearchParams, RequestOptions } from '@angular/http';
import { Observable } from 'rxjs';

import { Book } from './book';

@Injectable()
export class BookService {
    url = "api/books";
    constructor(private http:Http) { }
    getAllBooks(): Observable<Book[]> {
        return this.http.get(this.url)
                 .map(this.extractData)
                 .catch(this.handleError);
    }
    getBookById(bookId: string): Observable<Book[]> {
        let myHeaders = new Headers();
        myHeaders.append('Content-Type', 'application/json');
        let myParams = new URLSearchParams();
        myParams.append('id', bookId);
        let options = new RequestOptions({ headers: myHeaders, params: myParams });
        return this.http.get(this.url, options)
                .map(this.extractData)
                .catch(this.handleError);
    }
    getBooksAfterFilter(catg: string, wtr: string): Observable<Book[]> {
        let myHeaders = new Headers();
        myHeaders.set('Content-Type', 'application/json');
        let myParams = new URLSearchParams();
        myParams.set('category', catg);
        myParams.set('writer', wtr);
        let options = new RequestOptions({ headers: myHeaders, params: myParams });
        return this.http.get(this.url, options)
                .map(this.extractData)
                .catch(this.handleError);
    }
    private extractData(res: Response) {
        let body = res.json();
        return body.data;
    }
    private handleError (error: Response | any) {
        console.error(error.message || error);
        return Observable.throw(error.message || error);
    }
}
```

**book.component.ts**

```
import { Component, OnInit } from '@angular/core';
import { NgForm } from '@angular/forms';

import { BookService } from './book.service';
import { Book } from './book';

@Component({
   selector: 'app-book',
   templateUrl: './book.component.html',
   styleUrls: ['./book.component.css']
})
export class BookComponent implements OnInit {
   allBooks: Book[];
   book: Book;
   filteredListOfBooks: Book[];
   errorMessage: String;
   dataAvailableById= true;
   dataAvailableAfterFilter= true;
   categories = [
                 {name: 'Angular'},
                 {name: 'Hibernate'},
                 {name: 'Java'}
                ];
   writers = [
               {name: 'Krishna'},
               {name: 'Vishnu'}
             ];
   constructor(private bookService: BookService) { }

   ngOnInit(): void {
        this.getAllBooks();
   }
   getAllBooks() {
        this.bookService.getAllBooks()
          .subscribe(
                data => this.allBooks = data,
                error =>  this.errorMessage = <any>error);
   }
   getBookById(bookId: string) {
        this.dataAvailableById= true;
        this.book = null;
        this.bookService.getBookById(bookId)
            .subscribe(
                data => {
                    if(data.length > 0) {
                        this.book = data[0];
                    } else {
                        this.dataAvailableById= false;
                    }
                },
                error =>  this.errorMessage = <any>error
             );
   }
   getBooksAfterFilter(category: string, writer: string) {
        this.dataAvailableAfterFilter= true;
        this.filteredListOfBooks = null;
        this.bookService.getBooksAfterFilter(category, writer)
          .subscribe(
                data => {
                    if(data.length > 0) {
                        this.filteredListOfBooks = data;
                    } else {
                        this.dataAvailableAfterFilter= false;
                    }
                },
                error =>  this.errorMessage = <any>error
          );
   }
   bookById(bookByIdForm: NgForm) {
          let bookId = bookByIdForm.controls['bookId'].value;
          this.getBookById(bookId);
   }
   filterBooks(bookByIdForm: NgForm) {
         let catg = bookByIdForm.controls['category'].value;
         let wtr = bookByIdForm.controls['writer'].value;
         this.getBooksAfterFilter(catg, wtr);
   }
}
```

**book.component.html**

```
<h3>Book Details</h3>
<table>
  <tr><th> Id</th> <th>Name</th><th>Category</th><th>Writer</th></tr>
  <tr *ngFor="let bk of allBooks" >
    <td>{{bk.id}}</td> <td>{{bk.name}}</td> <td>{{bk.category}}</td> <td>{{bk.writer}}</td>
  </tr>
</table>
<h3>Get Book by ID </h3>
<div>
  <form #bookByIdForm= "ngForm" (ngSubmit)="bookById(bookByIdForm)">
         <div>
          Enter Book Id: <input name="bookId" ngModel required #bookId="ngModel">
         </div>
         <div> <br/>
           <button [disabled]="bookByIdForm.invalid">Submit</button>
         </div>
  </form>
</div>
<br/>
<div *ngIf="bookByIdForm.submitted">
    <div *ngIf="book; else loading">
```

```
        <table>
          <tr><th> Id</th> <th>Name</th><th>Category</th><th>Writer</th></tr>
          <tr>
                <td>{{book.id}}</td> <td>{{book.name}}</td> <td>{{book.category}}</td> <td>{{book.wr
          </tr>
        </table>
    </div>
    <ng-template #loading>
        <div *ngIf="dataAvailableById; else notAvailable">
               Loading data...
        </div>
        <ng-template #notAvailable> Data not Aavailable. </ng-template>
    </ng-template>
</div>
<h3>Filter Books </h3>
<div>
  <form #filterBookForm= "ngForm" (ngSubmit)="filterBooks(filterBookForm)">
        <div>
          Category:
          <select name="category" ngModel>
             <option value="" disabled>Select a Category</option>
             <option *ngFor="let category of categories" [ngValue]="category.name">
                {{ category.name }}
             </option>
          </select>
        </div> <br/>
        <div>
          Writer:
          <select name="writer" ngModel>
            <option value="" disabled>Select a Writer</option>
            <option *ngFor="let writer of writers" [ngValue]="writer.name">
               {{ writer.name }}
            </option>
          </select>
        </div>
        <div><br/>
           <button>Submit</button>
        </div>
  </form>
</div>
<br/>
<div *ngIf="filterBookForm.submitted">
    <div *ngIf="filteredListOfBooks; else loading">
        <table>
          <tr><th> Id</th> <th>Name</th><th>Category</th><th>Writer</th></tr>
          <tr *ngFor="let bk of filteredListOfBooks" >
                <td>{{bk.id}}</td> <td>{{bk.name}}</td> <td>{{bk.category}}</td> <td>{{bk.writer}}</
          </tr>
        </table>
    </div>
    <ng-template #loading>
        <div *ngIf="dataAvailableAfterFilter; else notAvailable">
               Loading data...
        </div>
        <ng-template #notAvailable> Data not Aavailable. </ng-template>
    </ng-template>
</div>

<div *ngIf="errorMessage" [ngClass] = "'error'"> {{errorMessage}} </div>
```

**book.component.css**

```
table {
    border-collapse: collapse;
}
table, th, td {
    border: 1px solid black;
}
.error{
    color: red;
    font-size: 20px;
}
```

**book.ts**

```
export class Book {
   id: string;
   name: string;
   category: string;
   writer: string;
   constructor() {
   }
}
```

**app.component.ts**

```
import { Component } from '@angular/core';

@Component({
   selector: 'app-root',
   template: `
                <app-book></app-book>
             `
})
export class AppComponent {

}
```

**app.module.ts**

```
import { NgModule } from '@angular/core';
import { BrowserModule } from '@angular/platform-browser';
import { FormsModule } from '@angular/forms';
import { HttpModule } from '@angular/http';
import { InMemoryWebApiModule } from 'angular-in-memory-web-api';

import { AppComponent }  from './app.component';
import { BookComponent }  from './book.component';
import { BookService } from './book.service';
import { BookData } from './book-data';

@NgModule({
  imports: [
        BrowserModule,
        HttpModule,
        FormsModule,
        InMemoryWebApiModule.forRoot(BookData)
  ],
  declarations: [
        AppComponent,
        BookComponent
  ],
  providers: [
        BookService
```

```
    ],
    bootstrap: [
          AppComponent
    ]
})
export class AppModule { }
```

## Run Application

To run the application, find following steps.

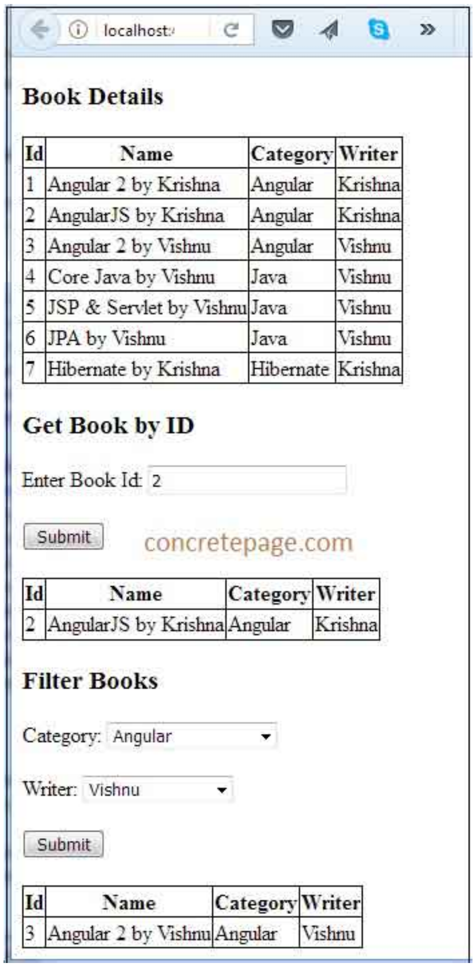
**1.** Download source code using download link given on this page.

**2.** In your angular CLI application, replace **src** folder.

**3.** Add `angular-in-memory-web-api` in **dependencies** block in `package.json` file.

**4.** Run **npm install** and then run **ng serve** .

**5.** Now access the URL **http://localhost:4200** . Find the print screen.



### Book Details

| Id | Name | Category | Writer |
|---|---|---|---|
| 1 | Angular 2 by Krishna | Angular | Krishna |
| 2 | AngularJS by Krishna | Angular | Krishna |
| 3 | Angular 2 by Vishnu | Angular | Vishnu |
| 4 | Core Java by Vishnu | Java | Vishnu |
| 5 | JSP & Servlet by Vishnu | Java | Vishnu |
| 6 | JPA by Vishnu | Java | Vishnu |
| 7 | Hibernate by Krishna | Hibernate | Krishna |

### Get Book by ID

Enter Book Id: 2

| Id | Name | Category | Writer |
|---|---|---|---|
| 2 | AngularJS by Krishna | Angular | Krishna |

### Filter Books

Category: Angular

Writer: Vishnu

| Id | Name | Category | Writer |
|---|---|---|---|
| 3 | Angular 2 by Vishnu | Angular | Vishnu |

Find the link for Angular 2 `Http` CRUD operation with Spring Boot.

Spring Boot REST + Angular 2 + JPA + Hibernate + MySQL CRUD Example

## References

Http
Headers
URLSearchParams
RequestOptions
Angular 2 Http post() Example

## Download Source Code

[angular-2-http-get-parameters-headers-urlsearchparams-requestoptions-example.zip]()

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