REST full Web Service & Javalin

Revisit HTML, CSS & JS

HTML tags are pre-defined

CSS – key-value pairs (all the keys are pre-defined and many of the values also pre-defined)

JS – It’s programming Lang of web/internet ( It gives life to webpage/website)

JS – is for user interaction & dom manipulation

DOM – Document Object Model (Tree like structure used for manipulating the web elements using javascript)

Browser - Application Software (Download & Install it) – [Google Chrome, Mozilla Firefox, Opera, Apple Safari, Microsoft Edge or IE (Internet Explorer) …. ]

Browser contains 3 engines

1. HTML Rendering Engine (Responsible for producing the output to html tags)
2. CSS Styling Engine (Responsible to generate style to the webpage)
3. JS Engine (Responsible for running the js code)

JavaScript – The official Name of JavaScript is ECMA Script [ES]

ES2015, ES 2016.. ES2017…….

ECMA – Electronics Computer Manufacturing Association

JAVASCRIPT

1. Keywords [ do, while, if, for, function, new, switch, case, break, null ]
2. Operators [+,-,\*,%,/, \*\*, ++, --, ? : ;, =>, &&, ||, !, <,>,<=,>=,==,===,… ]
3. Statements [expressions]
4. Data types [ string, number, boolean, undefined, null, array, function, object ]
5. Conditional Statements [if, else, switch]
6. Looping Statements [for, for in, for of, while, do while ]
7. Arrays [Single & multi dimensional arrays]
8. Functions [normal functions, arrow functions, IIFE (Immediately Invoked Function Expressions) ]
9. DOM uses two objects document, window
10. getElementById(“Id”), getElementsByName(), getElementsByTagName() ….
11. Client – Server Concept [ Request & Response ] Object
12. Request Object will be created in the client side by the Web browser
13. Response Object will be created by server

AJAX – Asynchronous Javascript and XML

Example : Let’s assume the following four task are totally independent

1. Printing a string in the console [20ms]
2. Opening a file and reading it’s content [500ms]
3. Submitting form data to the server [750ms]
4. Getting input from the user using javascript [250ms]

Total time needed to run all the steps in sequence /synchronous way = [20+500+750+250 = 1520ms]

Step by Step.

Executing the program in a proper step by step sequence is called synchronous operation.

Executing each step in parallel is called as Asynchronous operation

[AJAX, Arrow Functions, async ]

Sending a request object to server and getting the response back from server is a synchronous operation. [Blocking operation]

Ways of sending data from client to server

1. Using GET method (http method) – it appends the data in url in the form of key, value pairs

<file:///D:/Revature/Batch3/HTML%20WS/validate.html?email=sadfsdf%40sdfsd.com&pwd=dsfsdfsd>

1. Using POST method (http method – It adds the data to the body of the Request object)

Sending data from client to server

We use 1) Form tag

2) action attribute of the form tag will have details about the page where we are going to send the data.

<form action=”validate.jsp” method=”get”>

</form>

POSTMAN – Is the Software for testing the Web API/ Web Service End points

POSTMAN is a API Testing Tool.

Protocol – Set of rules

Send a Very Important document (Original Degree Certificate) from city A to City B (Assume both cities are metro cities)

1. Postal Service

Steps involved in sending the document by post (protocols)

1. Wrap the document with a cover
2. Write proper from and To address along with zip code and mobile number.
3. Registered Post or Speed Post with acknowledgement

The same rules applicable for internet.

Transferring of digital data from one place to another place. – this is what is happening in internet.

Internet Protocols – Set of rules governing the data transfer between devices.

Popular Protocols

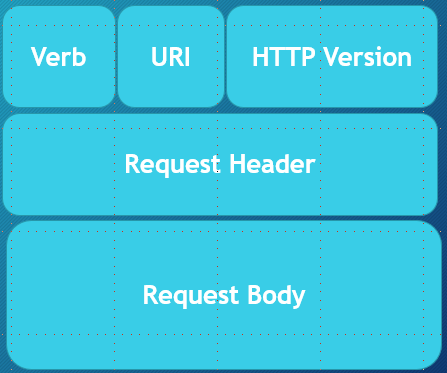
1. http – hypertext transfer protocol ( rules for transferring hypertext from one device to another device)
2. ftp - file transfer protocol
3. smtp – simple mail transfer protocol
4. pop – post office protocol

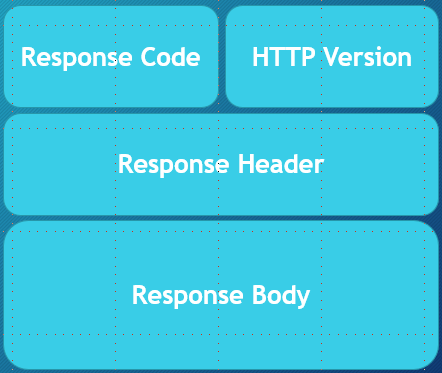
HTTP is a stateless protocol – It will not maintain any details about the previous request made.

Session handling mechanism – Cookies, Hidden Form fields, URL rewriting, Session Objects

TCP – Transmission control protocol

Pictorial representation of Request Object





HTTP Verbs are also called as HTTP Method

1. GET 2) POST 3) PUT 4) DELETE --- CRUD Operation

GET – Reading the Data

POST – Writing the DATA /Creating the Data

PUT – Updating existing data

DELETE – Removing existing data

http Response /Status code in a 3 digit number, which will give short information about the response object.

1. Informational Codes (100-199)
2. Success Codes (200-299)
3. Redirect Codes (300-399)
4. Client side errors (400-499)
5. Server Side errors (500-599)

Web Service – A Service offered by Web/internet

1. We can buy products
2. We can watch &/download movies
3. We can send & Receive emails
4. We can listen to &/ download songs
5. We can do video/voice/text chat or call

The term **Web service** (**WS**) is either:

* a service offered by an electronic device to another electronic device, communicating with each other via the [World Wide Web](https://en.wikipedia.org/wiki/World_Wide_Web) /internet , or
* a server running on a computer device, listening for requests at a particular port over a network, serving web documents (HTML, [JSON](https://en.wikipedia.org/wiki/JSON), [XML](https://en.wikipedia.org/wiki/XML), images).
* With the help of a URI (Uniform Resource Identifier) / End point calling/executing a method which is written in any programming language.

ATM Withdraw Operation

Let’s assume, You have ABC bank Debit Card.

1. Use ABC ATM with ABC Debit card (500 bucks) --- JAVA
2. XYZ ATM with ABC Debit Card (500 bucks withdrawn) -- .Net

With the help of Web Service, A dot net program can interact with java program.

A Java Program can interact with python program.

Common Data Exchange or Data Representation format -- XML, JSON

XML – eXtensible Markup Language

JSON – JavaScript Object Notation

|  |  |  |
| --- | --- | --- |
| Java class | XML | JSON |
| Class customer {  Private int id;  Private String name;  //constructors & getter setters  } | <customer>  <id> 100 </id>  <name> ABC </name>  </customer> | Customer = { “id” : 100, “name” :”ABC”} |

Types of Web Service

* 1. SOAP Based ( Simple Object Access Protocol - XML – WSDL )
  2. REST Based ( Representational State Transfer – Reuses http methods – JSON )

XML – JSON = Both used for representing the data.

XML/JSON Parsers are available for all popular programming language

Parser is a tool using that we can extract the data from XML/JSON

Parsing is a process of extracting the data from the XML/JSON

Web Services can be created using any programming language. (JAVA/.Net/Python /NodeJS …..)

 REST is an architectural style that outlines communication between a client and server over the web.

Web Services for getting Weather information, Currency conversion rates, Gold price, Oil price, Bitcoin price – Highly dynamic in nature)

Movie details,

Public web services --

WSDL – Web Service Definition/Description Language.

<https://www.themoviedb.org/> - TMDB – public REST ful web Service (Read Only Web Service)

To Create a REST full Web Service the easiest way is using Spring Boot – (It’s build on top of popular java based framework called Spring)

<https://Spring.io>

Spring is a Popular Java based framework which will help to create Enterprise level applications/ Web Service based applications very quickly and easily.

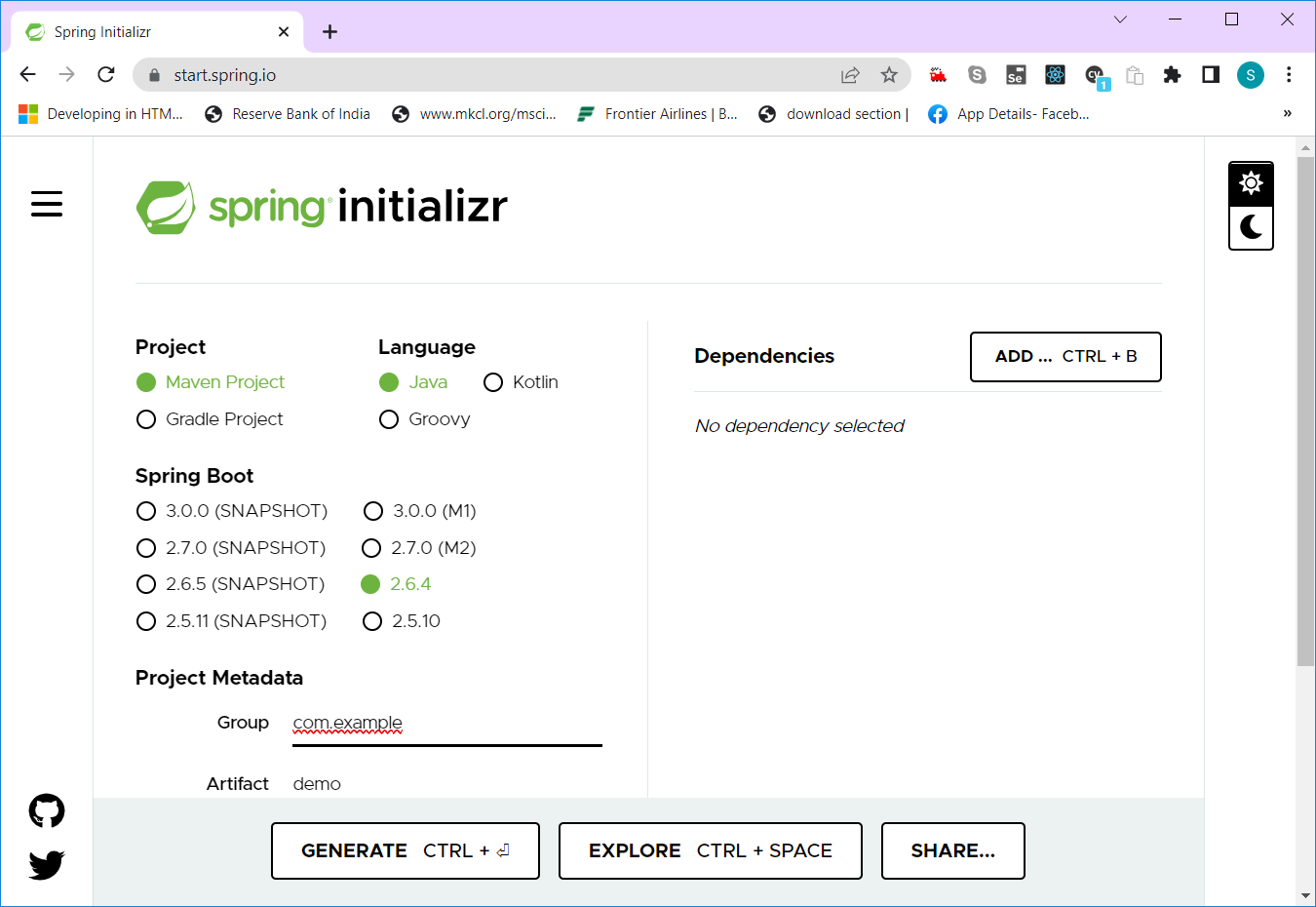
Different ways of creating Web Services using Spring boot

1. Using Spring Initializr (start.spring.io)
2. Using STS (Spring Tools Suite – It’s an Eclipse based IDE)
3. Using SpringBoot CLI (Command Line Interface)

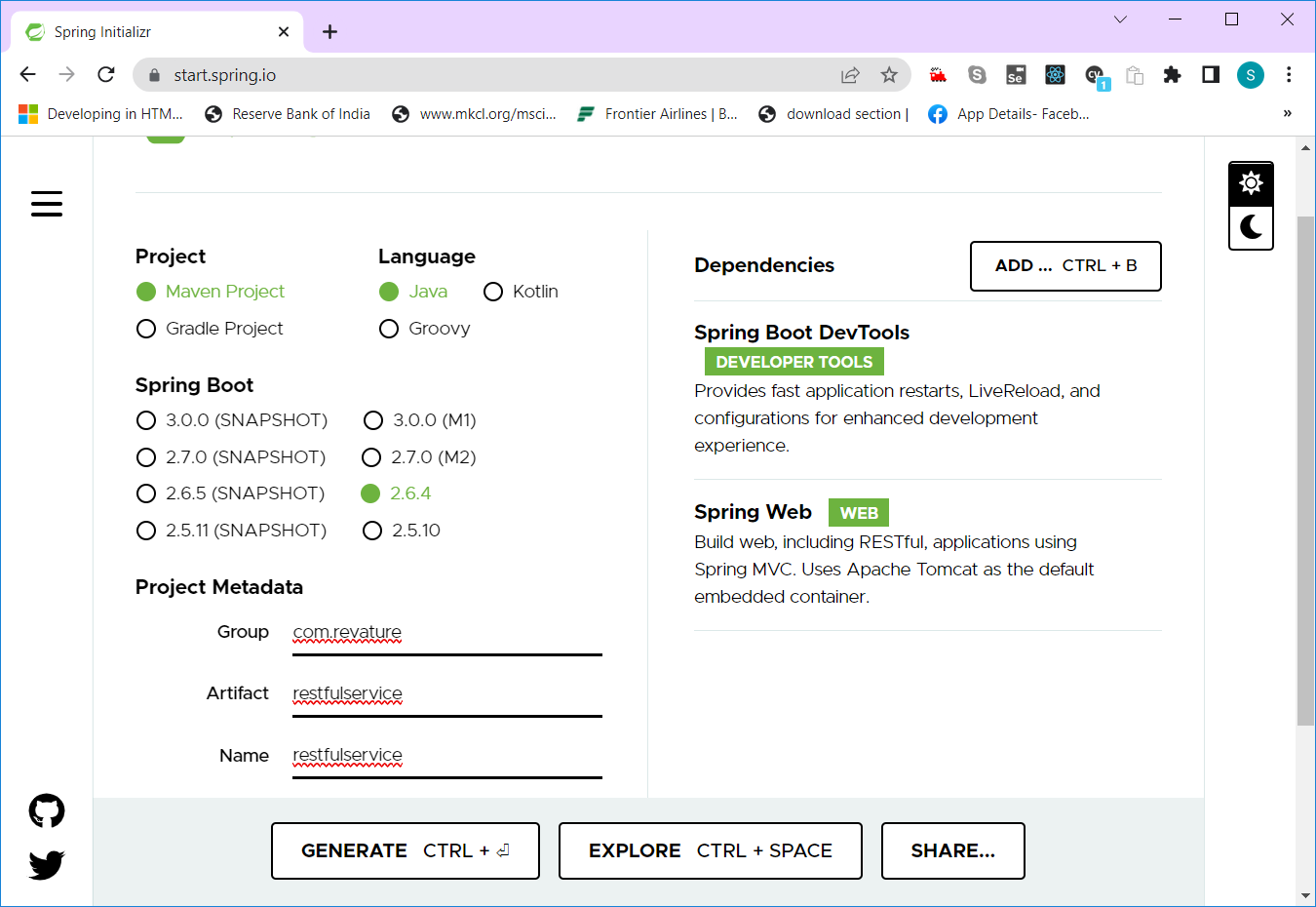
IDE – Integrated Development Environment

Steps to Create a SpringBoot based REST full service using Spring Initializr.

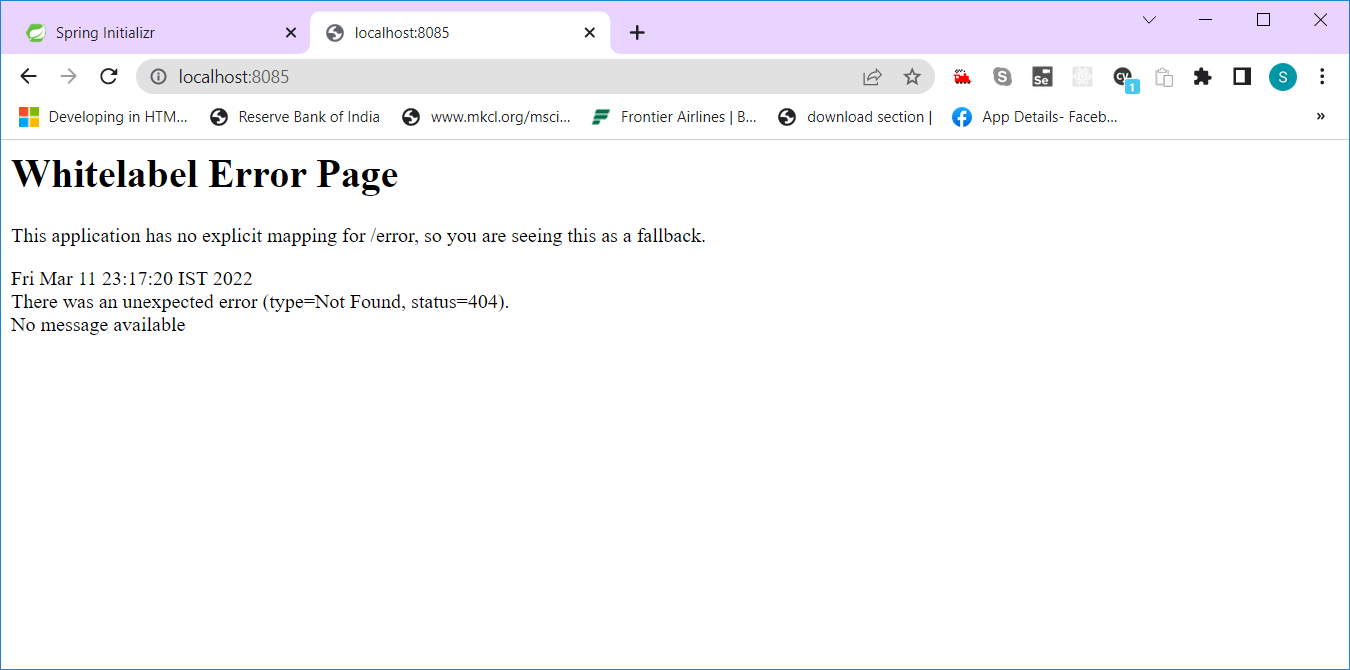
1. Open start.spring.io in browser



1. Select project configurations



1. Click on Generate / Explore Button
2. Download & Extract the zip file
3. Open the folder in Eclipse (File🡪 Open Existing Project)
4. Run the project as a Java Application
5. Open the browser and type localhost:8085



1. Add a new Class with the name “FirstController.java” in the package “com.revature.restfulservice.controller”

**package** com.revature.restfulservice.controller;

**import** org.springframework.web.bind.annotation.RequestMapping;

**import** org.springframework.web.bind.annotation.RestController;

@RestController

**public** **class** FirstController {

@RequestMapping("/welcome")

**public** String welcome() {

**return** "Hi ALL!!!Welcome to Spring Boot";

}

}