

WEEK 5 HANDS ON EXERCISE

Creating Microservices for account and loan

In this hands on exercises, we will create two microservices for a bank. One microservice for handing accounts and one for handling loans.

Each microservice will be a specific independent Spring RESTful Webservice maven project having its own pom.xml. The only difference is that, instead of having both account and loan as a single application, it is split into two different applications. These webservices will be a simple service without any backend connectivity.

Follow steps below to implement the two microservices:

Account Microservice

- Create folder with employee id in D: drive
- Create folder named 'microservices' in the new folder created in previous step. This folder will contain all the sample projects that we will create for learning microservices.
- Open <https://start.spring.io/> in browser
- Enter form field values as specified below:
 - Group: com.cognizant
 - Artifact: account
- Select the following modules
 - Developer Tools > Spring Boot DevTools
 - Web > Spring Web
- Click generate and download the zip file
- Extract 'account' folder from the zip and place this folder in the 'microservices' folder created earlier
- Open command prompt in account folder and build using mvn clean package command
- Import this project in Eclipse and implement a controller method for getting account details based on account number. Refer specification below:
 - Method: GET
 - Endpoint: /accounts/{number}
 - Sample Response. Just a dummy response without any backend connectivity.

```
{ number: "00987987973432", type: "savings", balance: 234343 }
```

- Launch by running the application class and test the service in browser

Loan Microservice

- Follow similar steps specified for Account Microservice and implement a service API to get loan account details
 - Method: GET
 - Endpoint: /loans/{number}
 - Sample Response. Just a dummy response without any backend connectivity.

```
{ number: "H00987987972342", type: "car", loan: 400000, emi: 3258, tenure: 18 }
```

- Launching this application by having account service already running
- This launch will fail with error that the bind address is already in use
- The reason is that each one of the service is launched with default port number as 8080. Account service is already using this port and it is not available for loan service.
- Include "server.port" property with value 8081 and try launching the application
- Test the service with 8081 port

Now we have two microservices running on different ports.

NOTE: The console window of Eclipse will have both the service console running. To switch between different consoles use the monitor icon within the console view.

ACCOUNT CONTROLLER:

```
package com.cognizant.account.controller;
```

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

```
import java.util.Map;
```

```
@RestController
```

```
@RequestMapping("/accounts")
```

```
public class AccountController {
```

```

    @GetMapping("/{number}")

    public Map<String, Object> getAccountDetails(@PathVariable String number) {

        return Map.of(

            "number", number,

            "type", "savings",

            "balance", 234343

        );

    }

}

```

LOAN CONTROLLER:

```

package com.cognizant.loan.controller;

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

import java.util.Map;

@RestController

@RequestMapping("/loans")

public class LoanController {

    @GetMapping("/{number}")

```

```

public Map<String, Object> getLoanDetails(@PathVariable String number) {

    return Map.of(

        "number", number,

        "type", "car",

        "loan", 400000,

        "emi", 3258,

        "tenure", 18

    );

}

}

```

CONSOLE:

```

2025-07-20T21:35:35.279+05:30 INFO 1180 --- [account] [ restartedMain] c.cognizant.account.AccountApplication : Starting AccountApplication using Java 24.0.1
with PID 1180 (C:\Employee_id\microservices\account\target\classes started by nehar in C:\Employee_id\microservices\account)
2025-07-20T21:35:35.282+05:30 INFO 1180 --- [account] [ restartedMain] c.cognizant.account.AccountApplication : No active profile set, falling back to 1 default
profile: "default"
2025-07-20T21:35:35.361+05:30 INFO 1180 --- [account] [ restartedMain] .e.DevToolsPropertyDefaultsPostProcessor : Devtools property defaults active! Set 'spring.devtools.add-properties' to
'false' to disable
2025-07-20T21:35:35.361+05:30 INFO 1180 --- [account] [ restartedMain] .e.DevToolsPropertyDefaultsPostProcessor : For additional web related logging consider s
etting the 'logging.level.web' property to 'DEBUG'
2025-07-20T21:35:36.995+05:30 INFO 1180 --- [account] [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port 8080 (http)
2025-07-20T21:35:37.020+05:30 INFO 1180 --- [account] [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2025-07-20T21:35:37.020+05:30 INFO 1180 --- [account] [ restartedMain] o.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/10.1.
42]
2025-07-20T21:35:37.083+05:30 INFO 1180 --- [account] [ restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2025-07-20T21:35:37.084+05:30 INFO 1180 --- [account] [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization co
mpleted in 1722 ms
2025-07-20T21:35:37.617+05:30 WARN 1180 --- [account] [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : Unable to start LiveReload server
2025-07-20T21:35:37.670+05:30 INFO 1180 --- [account] [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8080 (http) with conte
xt path '/'
2025-07-20T21:35:37.688+05:30 INFO 1180 --- [account] [ restartedMain] c.cognizant.account.AccountApplication : Started AccountApplication in 2.982 seconds (
process running for 3.612)

```

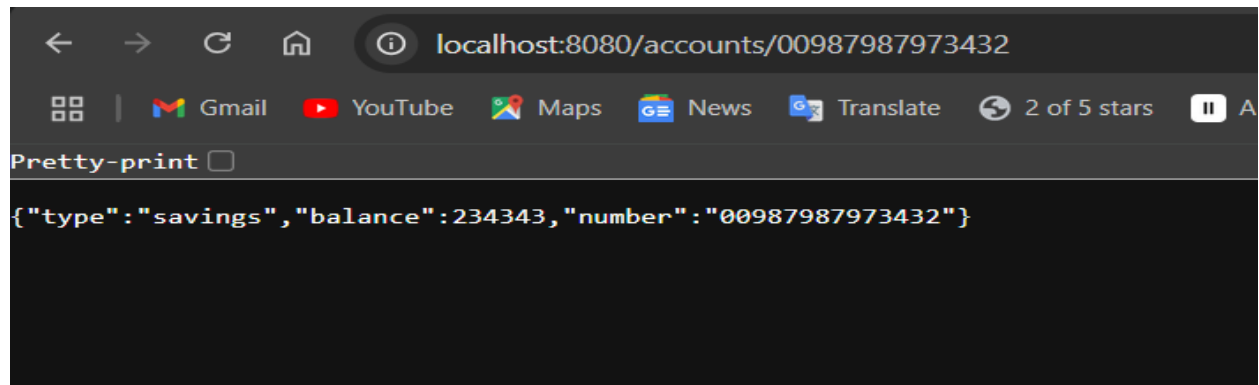
```

2025-07-20T21:23:01.155+05:30 INFO 5036 --- [loan] [ restartedMain] o.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/10.1.42]
2025-07-20T21:23:01.154+05:30 INFO 5036 --- [loan] [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2025-07-20T21:23:01.154+05:30 INFO 5036 --- [loan] [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2025-07-20T21:23:01.154+05:30 INFO 5036 --- [loan] [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2025-07-20T21:23:01.155+05:30 INFO 5036 --- [loan] [ restartedMain] o.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/10.1.42]
2025-07-20T21:23:01.198+05:30 INFO 5036 --- [loan] [ restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2025-07-20T21:23:01.198+05:30 INFO 5036 --- [loan] [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 781 ms
2025-07-20T21:23:01.479+05:30 INFO 5036 --- [loan] [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 35729
2025-07-20T21:23:01.512+05:30 INFO 5036 --- [loan] [ restartedMain] o.s.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8081 (http) with context path '/'
2025-07-20T21:23:01.519+05:30 INFO 5036 --- [loan] [ restartedMain] com.cognizant.loan.LoanApplication : Started LoanApplication in 1.533 seconds (process running for 1.901)
2025-07-20T21:24:52.853+05:30 INFO 5036 --- [loan] [nio-8081-exec-2] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring DispatcherServlet 'dispatcherServlet'
2025-07-20T21:24:52.854+05:30 INFO 5036 --- [loan] [nio-8081-exec-2] o.s.web.servlet.DispatcherServlet : Initializing Servlet 'dispatcherServlet'
2025-07-20T21:24:52.857+05:30 INFO 5036 --- [loan] [nio-8081-exec-2] o.s.web.servlet.DispatcherServlet : Completed initialization in 1 ms

```

OUTPUT:

ACCOUNTS:

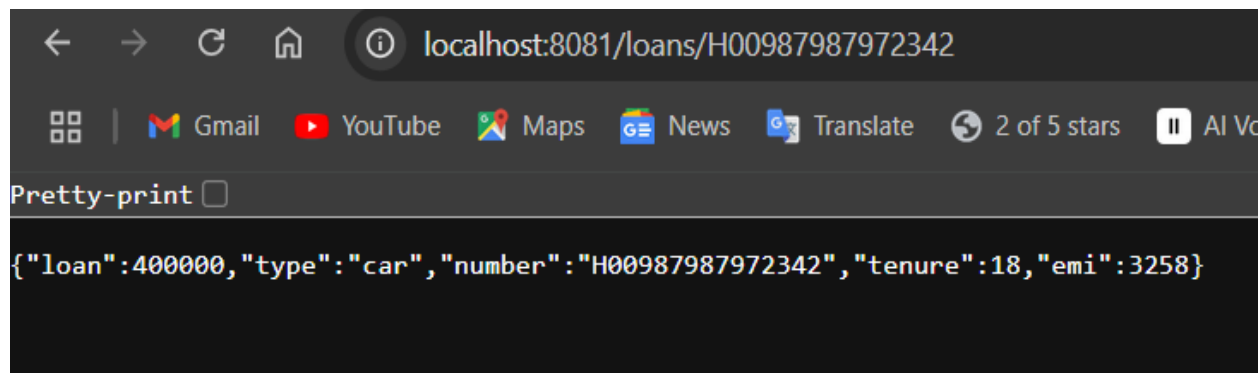


localhost:8080/accounts/00987987973432

Pretty-print ☐

```
{\"type\": \"savings\", \"balance\": 234343, \"number\": \"00987987973432\"}
```

LOANS:



localhost:8081/loans/H00987987972342

Pretty-print ☐

```
{\"loan\": 400000, \"type\": \"car\", \"number\": \"H00987987972342\", \"tenure\": 18, \"emi\": 3258}
```