WEEK – 05

Microservices with API gateway

1.Creating Microservices for account and loan
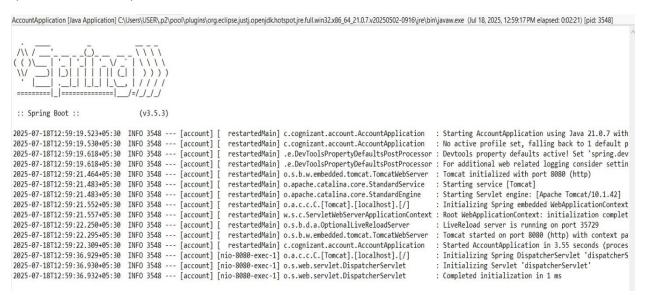
AccountController.java:

```java
package com.cognizant.account;

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

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

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

import java.util.Map;

@RestController

public class AccountController {

    @GetMapping("/accounts/{number}")

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

        return Map.of(

            "number", number,

            "type", "savings",

            "balance", 234343

        );

    }

}
```

AccountApplication.java:

```java
package com.cognizant.account;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

public class AccountApplication {

    public static void main(String[] args) {

        SpringApplication.run(AccountApplication.class, args);

    }

}
```

Output:

(For Account)

```
AccountApplication [Java Application] C:\Users\USER\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe  (Jul 18, 2025, 12:59:17 PM elapsed: 0:02:21) [pid: 3548]

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 :: Spring Boot ::                (v3.5.3)

2025-07-18T12:59:19.523+05:30  INFO 3548 --- [account] [  restartedMain] c.cognizant.account.AccountApplication    : Starting AccountApplication using Java 21.0.7 with
2025-07-18T12:59:19.530+05:30  INFO 3548 --- [account] [  restartedMain] c.cognizant.account.AccountApplication    : No active profile set, falling back to 1 default p
2025-07-18T12:59:19.618+05:30  INFO 3548 --- [account] [  restartedMain] .e.DevToolsPropertyDefaultsPostProcessor  : Devtools property defaults active! Set 'spring.dev
2025-07-18T12:59:19.618+05:30  INFO 3548 --- [account] [  restartedMain] .e.DevToolsPropertyDefaultsPostProcessor  : For additional web related logging consider settin
2025-07-18T12:59:21.464+05:30  INFO 3548 --- [account] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer   : Tomcat initialized with port 8080 (http)
2025-07-18T12:59:21.483+05:30  INFO 3548 --- [account] [  restartedMain] o.apache.catalina.core.StandardService    : Starting service [Tomcat]
2025-07-18T12:59:21.483+05:30  INFO 3548 --- [account] [  restartedMain] o.apache.catalina.core.StandardEngine     : Starting Servlet engine: [Apache Tomcat/10.1.42]
2025-07-18T12:59:21.552+05:30  INFO 3548 --- [account] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]        : Initializing Spring embedded WebApplicationContext
2025-07-18T12:59:21.557+05:30  INFO 3548 --- [account] [  restartedMain] w.s.c.ServletWebServerApplicationContext  : Root WebApplicationContext: initialization complet
2025-07-18T12:59:22.250+05:30  INFO 3548 --- [account] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer        : LiveReload server is running on port 35729
2025-07-18T12:59:22.295+05:30  INFO 3548 --- [account] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer   : Tomcat started on port 8080 (http) with context pa
2025-07-18T12:59:22.309+05:30  INFO 3548 --- [account] [  restartedMain] c.cognizant.account.AccountApplication    : Started AccountApplication in 3.55 seconds (proces
2025-07-18T12:59:36.929+05:30  INFO 3548 --- [account] [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]        : Initializing Spring DispatcherServlet 'dispatcherS
2025-07-18T12:59:36.930+05:30  INFO 3548 --- [account] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet         : Initializing Servlet 'dispatcherServlet'
2025-07-18T12:59:36.932+05:30  INFO 3548 --- [account] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet         : Completed initialization in 1 ms
```

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

Explanation: (For Account)

- The Spring Boot project for the Account microservice was downloaded as a ZIP file from start.spring.io.
- After extraction, the folder was initially placed as D:\123456\microservices\account\account, creating an unnecessary nested directory.
- This structure caused navigation issues in Command Prompt and confusion during project import in Eclipse.
- To fix this, the inner account folder content (like pom.xml, src/, etc.) was moved up to D:\123456\microservices\account.
- The corrected structure ensures Maven can build the project properly and Eclipse can recognize it as a valid Maven project.
- A clean folder structure is essential for effective project setup, build, and IDE integration.

LoanController.java:

package com.cognizant.loan;

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

```java
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.RestController;
import java.util.Map;

@RestController
public class LoanController {

    @GetMapping("/loans/{number}")
    public Map<String, Object> getLoanDetails(@PathVariable String number) {
        return Map.of(
            "number", number,
            "type", "home loan",
            "amount", 500000
        );
    }
}
```

LoanApplication.java:

```java
package com.cognizant.loan;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication
public class LoanApplication {
    public static void main(String[] args) {
```

```
		SpringApplication.run(LoanApplication.class, args);

	}

}
```

Output:

(For Loan Services)

```
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 :: Spring Boot ::                (v3.5.3)

2025-07-19T16:07:54.063+05:30  INFO 2764 --- [account] [  restartedMain] com.cognizant.loan.LoanApplication           : Starting LoanApplication using Java 21.0.7 with PI
2025-07-19T16:07:54.069+05:30  INFO 2764 --- [account] [  restartedMain] com.cognizant.loan.LoanApplication           : No active profile set, falling back to 1 default p
2025-07-19T16:07:54.148+05:30  INFO 2764 --- [account] [  restartedMain] .e.DevToolsPropertyDefaultsPostProcessor     : Devtools property defaults active! Set 'spring.dev
2025-07-19T16:07:54.148+05:30  INFO 2764 --- [account] [  restartedMain] .e.DevToolsPropertyDefaultsPostProcessor     : For additional web related logging consider settin
2025-07-19T16:07:55.585+05:30  INFO 2764 --- [account] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer      : Tomcat initialized with port 8080 (http)
2025-07-19T16:07:55.610+05:30  INFO 2764 --- [account] [  restartedMain] o.apache.catalina.core.StandardService       : Starting service [Tomcat]
2025-07-19T16:07:55.610+05:30  INFO 2764 --- [account] [  restartedMain] o.apache.catalina.core.StandardEngine        : Starting Servlet engine: [Apache Tomcat/10.1.42]
2025-07-19T16:07:55.663+05:30  INFO 2764 --- [account] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]           : Initializing Spring embedded WebApplicationContext
2025-07-19T16:07:55.667+05:30  INFO 2764 --- [account] [  restartedMain] w.s.c.ServletWebServerApplicationContext     : Root WebApplicationContext: initialization complet
2025-07-19T16:07:56.218+05:30  INFO 2764 --- [account] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer           : LiveReload server is running on port 35729
2025-07-19T16:07:56.259+05:30  INFO 2764 --- [account] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer      : Tomcat started on port 8080 (http) with context pa
2025-07-19T16:07:56.272+05:30  INFO 2764 --- [account] [  restartedMain] com.cognizant.loan.LoanApplication           : Started LoanApplication in 3.002 seconds (process
2025-07-19T16:08:10.532+05:30  INFO 2764 --- [account] [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]           : Initializing Spring DispatcherServlet 'dispatcherS
2025-07-19T16:08:10.534+05:30  INFO 2764 --- [account] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet            : Initializing Servlet 'dispatcherServlet'
2025-07-19T16:08:10.537+05:30  INFO 2764 --- [account] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet            : Completed initialization in 2 ms
```

Pretty-print ☐

{"number":"0011223344","amount":500000,"type":"home loan"}

Explanation:(For LoanServices)

- A separate Spring Boot project for the Loan microservice was generated using start.spring.io with group as com.cognizant and artifact as loan.
- LoanApplication.java is the main class that bootstraps the Loan Microservice.
- It is located in the package com.cognizant.loan and created automatically by Spring Initializr.
- The class is annotated with @SpringBootApplication, which enables component scanning, auto-configuration, and Spring configuration.
- The main() method uses SpringApplication.run() to start the embedded Tomcat server and initialize the application.

- This class acts as the entry point of the microservice and runs as a standalone Java application.