

## Project Guide.

1. Technology.
  - Java 8, Spring boot, Hibernate, h2 in-memory database.
  - Junit4, Mockito.
2. Solution Design.
  - Create Account table with field (id,name,balance). Name is not duplicated and balance can not be negative.
  - Deduce balance from sender account and credit to receiver account directly when transferring.
  - create a cache to store accountid and lock object,each accountid has a lock object, before start transaction I lock 2 account (from and to) and release them when transaction is finished to avoid conflict data between many transactions.
3. Limitation
  - when locking 2 account at the same time, need to check carefully when using 2 those locks object in other codes to avoid deadlock.
  - when updating directly balance to Account table, that make difficult to validate data in future.
  - when a transaction update wrong balance we don't know how to verify balance is correct or not.
  - can improve by creat transaction table store all transaction created for all accounts
4. Deploy.
  - Step 1 build project using maven "mvn clean install"
  - Step 2 create /deploy folder
  - Step 3 go to target folder copy ingenico-project-spring-boot.jar to /deploy folder.
  - Step 4 go to /deploy folder and run java command "java -jar ingenico-project-spring-boot.jar"
5. Test.

API	Create new account.
URL	<a href="http://localhost:8080/ingenico/account">http://localhost:8080/ingenico/account</a>
HTTP METHOD	POST
Header	[{"key":"Content-Type","value":"application/json","description":""}]
Body	{"id":null,"balance":100.0,"name":"test"}
Response OK	{ "status": 1, "error": "Request successful, no exception" }
Response Error	{ "status": 0, "error": "<Detail>" }

Error messages	Account name does exist. Balance must be positive number.
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API	Transfer money
URL	<a href="http://localhost:8080/ingenico/account">http://localhost:8080/ingenico/account</a>
HTTP METHOD	POST
Header	[{"key": "Content-Type", "value": "application/json", "description": ""}]
Body	{"fromAccountId": 4, "toAccountId": 5, "amount": 100.0}
Response OK	{ "status": 1, "error": "Request successful, no exception" }
Response Error	{ "status": 0, "error": "<Detail>" }
Error messages	Account id <id> does not exist Account balance is insufficient for this transaction.

6. Database verify

Go to <http://localhost:8080/console/>

Login with this details

Login

Saved Settings: Generic H2 (Embedded)

Setting Name: Generic H2 (Embedded) Save Remove

Driver Class: org.h2.Driver

JDBC URL: jdbc:h2:mem:testdb

User Name: sa

Password:

Connect Test Connection