

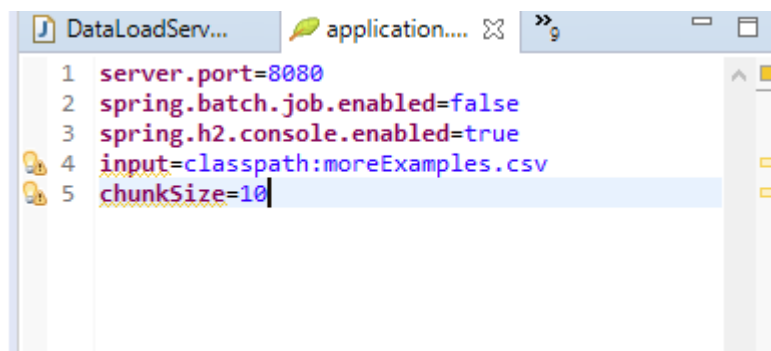
# TransferWise Task

To solve the problem, batch approach is chosen because data can't be loaded in one shot when the data volume is high. This approach is scalable.

Ideally the business rules should be kept in .drl file so that business can change the .drl file without changing the application code. Rules can be complex some times this way it will not affect the code and the module will be loosely coupled.

But in the current implementation rules are written in the application code in a different class.

Configuration properties are externalized in application. Properties file.

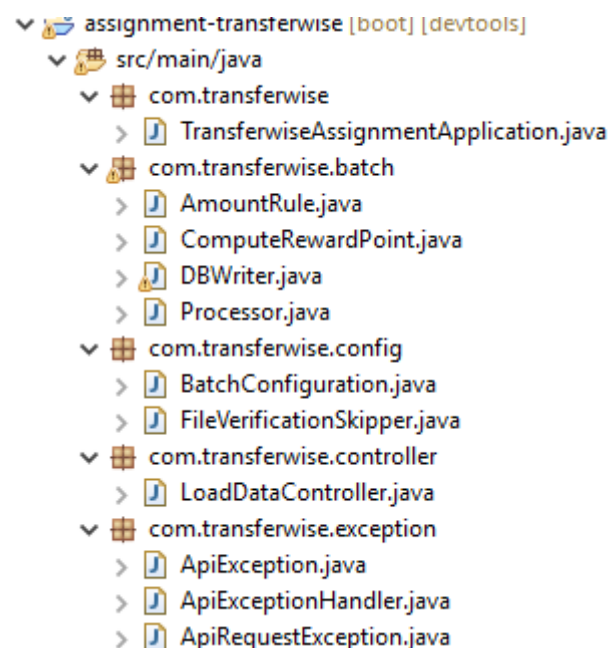


Using Spring Batch approach is used to solve this business problem due to the above stated reason.

There are multiple steps involved:

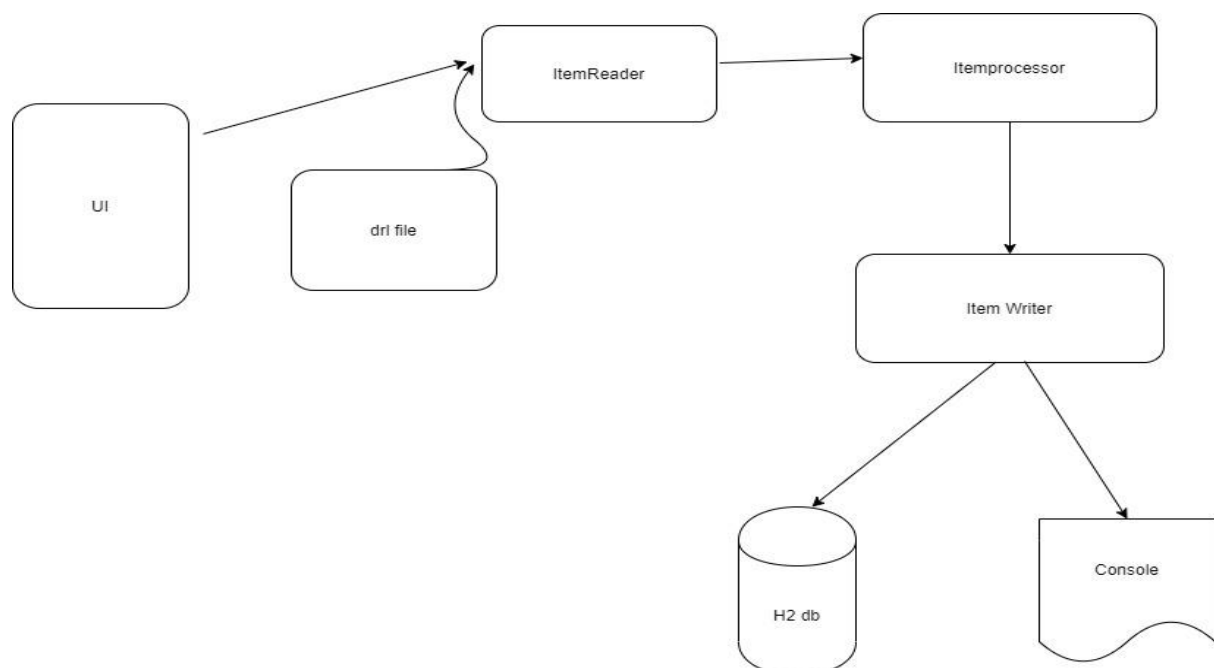
- Reading the data from the csv file.
- Process (apply business rules) on the batch.
- Persist to DB (h2 database)

## Project Structure:



- com.transferwise.model
      - Customer.java
    - com.transferwise.repository
      - CustomerRepository.java
    - com.transferwise.service
      - CustomerListner.java
      - DataLoadService.java
      - DataLoadServiceImpl.java
  - src/main/resources
    - application.properties
    - moreExamples.csv
    - transaction\_rules.drl
    - transactions.csv
  - src/test/java
    - com.transferwise.test
      - ComputeRewardPointTest.java
        - ComputeRewardPointTest
      - TransferwiseAssignmentApplicationTest.java
  - JRE System Library [JavaSE-1.8]
  - Maven Dependencies
  - target/generated-sources/annotations
  - target/generated-test-sources/test-annotations

## High Level Flow



# Test Results

## Junit

Package Explorer JUnit 33  
Finished after 4.426 seconds

Runs: 19/19 Errors: 0 Failures: 0

com.transferwise.test.ComputeRewardPointTest [Runner: JUnit 4] (1.957 s)

- shouldGetRewardPointDefault (0.002 s)
- shouldMatchForAmountLessThan0\_ECOM (0.000 s)
- shouldMatchForAmountLessThan5\_ECOM (0.000 s)
- shouldGetRewardPointECOM (0.000 s)
- shouldMatchForValidRewardPoint\_Airlines (0.000 s)
- shouldMatchForValidRewardPoint (0.000 s)
- shouldMatchForAmountLessThan1000\_Airlines (0.006 s)
- shouldMatchForAmountLessThanTwoPointFive\_Airlines (0.000 s)
- shouldMatchForAmountLessThan5\_Airlines (0.000 s)
- shouldNotReturnRewardPoint (0.001 s)
- shouldMatchForAmountLessThan100\_Airlines (0.000 s)
- shouldMatchForAmountLessThanTwoPointFive\_ECOM (0.000 s)
- shouldMatchForAmountLessThan1000\_ECOM (0.000 s)
- shouldMatchForAmountLessThan300\_Airlines (0.000 s)
- shouldMatchForAmountLessThan300\_ECOM (0.000 s)
- shouldMatchForAmountLessThan0\_Airlines (0.305 s)
- shouldMatchForAmountLessThan100\_ECOM (1.356 s)
- shouldMatchForAmountLessThan10\_Airlines (0.161 s)
- shouldMatchForAmountLessThan10\_ECOM (0.117 s)

Swagger UI: <http://localhost:8080/swagger-ui.html#!/load-data-controller/loadUsingGET>

swagger default (/v2/api-docs) Explore

## Api Documentation

Api Documentation

Apache 2.0

### load-data-controller : Load Data Controller

Show/Hide | List Operations | Expand Operations

GET /load/transaction Import excel data resource

Response Class (Status 200)  
string

Response Content Type \*/\*

#### Curl

```
curl -X GET --header 'Accept: application/json' 'http://localhost:8080/load/transaction'
```

#### Request URL

```
http://localhost:8080/load/transaction
```

#### Request Headers

```
{  "Accept": "*/*"}
```

#### Response Body

```
"COMPLETED"
```

#### Response Code

```
200
```

#### Response Headers

```
{  "content-type": "application/json;charset=UTF-8",  "date": "Sun, 15 Mar 2020 11:12:40 GMT",  "transfer-encoding": "chunked"}
```

Validated the code output with the sample example trasactions.csv file.

```
[io-8080-exec-10] o.a.c.c.C.[localhost].[/] : Initializing Spring FrameworkServlet 'dispatcherServlet'
[io-8080-exec-10] o.s.web.servlet.DispatcherServlet : FrameworkServlet 'dispatcherServlet': initialization started
[io-8080-exec-10] o.s.web.servlet.DispatcherServlet : FrameworkServlet 'dispatcherServlet': initialization completed in 58 ms
[io-8080-exec-10] o.s.b.c.l.support.SimpleJobLauncher : Job: [SimpleJob: [name= ]] launched with the following parameters: [{time=1584282561105}]
[io-8080-exec-10] c.transferwise.service.CustomerListner : ..... Job created time..... Sun Mar 15 19:59:21 IST 2020
[io-8080-exec-10] o.s.batch.core.job.SimpleStepHandler : Executing step: [class path resource [transactions.csv]-load]
[io-8080-exec-10] com.transferwise.batch.DBWriter : Expected Output as below

[io-8080-exec-10] com.transferwise.batch.DBWriter : Transaction ID:f411d086-85fd-4904-8c33-e32a008abf0a, Customer ID: Jane Doe, Reward Points: 80.0
[io-8080-exec-10] com.transferwise.batch.DBWriter : Transaction ID:a234509b-88a9-4451-9d92-21d8475e8def, Customer ID: John Smith, Reward Points: 8.0
[io-8080-exec-10] com.transferwise.batch.DBWriter : Transaction ID:d3224620-1298-49cc-9c7c-7a29dd2d3f3d, Customer ID: Uvuvwevwevwe dnyeteneyevwe, Reward Points: 86.0
[io-8080-exec-10] com.transferwise.batch.DBWriter : .....

[io-8080-exec-10] o.s.b.c.l.support.SimpleJobLauncher : Job: [SimpleJob: [name= ]] completed with the following parameters: [{time=1584282561105}] and the following status:
[io-8080-exec-10] c.t.service.DataLoadServiceImpl : JobExecution: COMPLETED
[io-8080-exec-10] c.t.service.DataLoadServiceImpl : .....Batch is Running.....
```

Snapshot of H2 contents for all the reward points of customer:

localhost:8080/h2-console/login.do?sessionId=84d00072115a23368a5eaeab2822dcbb

Apps AMS - Login Leave Management... Offers Offers Sign in - GitLab Login - OTRS JIRA Log In - Confluence Agile Board - Tavan...

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

Run Run Selected Auto complete Clear SQL statement:

SELECT \* FROM CUSTOMER

ID	CUSTOMER_ID	CUSTOMER_NAME	BANK_NAME	MERCHANT_NAME	MERCHANT_TYPE	REWARD_POINT_FOR_ONE_TRANSACTION	TRANSACTION_AMOUNT
1	a234509b-88a9-4451-9d92-21d8475e8def	John Smith	Shady Bank	Starbucks	Fast Food	2.0	2.5
2	f411d086-85fd-4904-8c33-e32a008abf0a	Jane Doe	Archaic Big Bank	Amazon Shopping	Book Stores	73.0	730.0
3	a234509b-88a9-4451-9d92-21d8475e8def	John Smith	Shady Bank	Starbucks	Fast Food	2.0	2.5
4	f411d086-85fd-4904-8c33-e32a008abf0a	Jane Doe	Archaic Big Bank	Netflix	Online Services	3.0	11.99
5	d3224620-1298-49cc-9c7c-7a29dd2d3f3d	Uvuvwevwevwe dnyeteneyevwe	Challenger Bank	Waitrose	Supermarket	26.009999999999998	289.0
6	f411d086-85fd-4904-8c33-e32a008abf0a	Jane Doe	Archaic Big Bank	Tesco	Supermarket	3.0	7.0
7	d3224620-1298-	Uvuvwevwevwe	Challenger	BRITISHAIRWAYS	Airlines	60.0	300.0

Job details:

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

Run Run Selected Auto complete Clear SQL statement:

SELECT \* FROM BATCH\_JOB\_EXECUTION

JOB_EXECUTION_ID	VERSION	JOB_INSTANCE_ID	CREATE_TIME	START_TIME	END_TIME	STATUS	EXIT_CODE	EXIT_MESSAGE	LAST_UPDATED	JOB_CONFIGURATION_LOCATION
1	2	1	2020-03-15 19:59:21.183	2020-03-15 19:59:21.247	2020-03-15 19:59:21.869	COMPLETED	COMPLETED		2020-03-15 19:59:21.872	null

(1 row, 7 ms)

Edit

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

Run Run Selected Auto complete Clear SQL statement:

SELECT \* FROM BATCH\_STEP\_EXECUTION

STEP_EXECUTION_ID	VERSION	STEP_NAME	JOB_EXECUTION_ID	START_TIME	END_TIME	STATUS	COMMIT_COUNT	READ_COUNT	FILTER_COUNT	WRITE_COUNT
1	60	class path resource [moreExamples.csv]-load	1	2020-03-15 20:07:40.313	2020-03-15 20:07:42.194	COMPLETED	58	1151	0	1151

(1 row, 6 ms)

Edit

```
application... x10 Console
1 server.port=8080
2 spring.batch.job.enabled=false
3 spring.h2.console.enabled=true
4 input=classpath:moreExamples.csv
5 chunkSize=20

spring-batch-example-1 - TransferviseAssignmentApplication [Spring Boot App] C:\Program Files\Java\jdk1.8.0_171\bin\javaw.exe (15-Mar-2020, 7:58:57 pm)
: Initializing Spring FrameworkServlet 'dispatcherServlet'
: FrameworkServlet 'dispatcherServlet': initialization started
: FrameworkServlet 'dispatcherServlet': initialization completed in 9 ms
: Job: [SimpleJob: [name= ]] launched with the following parameters: [(time=1584283060289)]
: ..... Job created time..... Sun Mar 15 20:07:40 IST 2020
: Executing step: [class path resource [moreExamples.csv]-load]
: Expected Output as below

: Transaction ID:7f793e70-5d88-4e30-b456-47086fc032f2, Customer ID: Lloyd Hill Welch, Reward Points: 794164.0
: Transaction ID:9ea8521a-e1bd-404e-8a92-0d6f66e7e727, Customer ID: Hilaria Cormier Spencer, Reward Points: 382982.0
: Transaction ID:13d4187f-44a1-43e1-8beb-1627495a03a4, Customer ID: Sung Hermiston Welch, Reward Points: 503648.0
: Transaction ID:70a49c6b-7685-4d0f-8a8d-17ae1f48970a, Customer ID: Terrance Watsica Orn, Reward Points: 326224.0
: Transaction ID:e3a905d0-d131-4ca4-9f91-252940e6c0d4, Customer ID: Marya Thiel Armstrong PhD, Reward Points: 377194.0
: Transaction ID:6997b9ee-6337-4925-b88a-d7693ae2d7ba, Customer ID: Heide Cremin Nicolas, Reward Points: 311361.0
: Transaction ID:e4468890-adbb-4c79-bc5b-bf103fe83946, Customer ID: Verna Hagenes Hackett, Reward Points: 891445.0
: Transaction ID:95b796d6-c89b-48ae-8cbd-7119046a7ae2, Customer ID: Dexter Zooncak Leannon DDS, Reward Points: 958926.0
: Transaction ID:50f925f4-3e05-4a8b-bb7d-3e8efb1703c2, Customer ID: Miss Kandy Mayer Romaguera, Reward Points: 840389.0
: Transaction ID:57d45105-887f-4b98-b6f5-c6d7346994aa, Customer ID: Rene Kohler Reichert, Reward Points: 489277.0
: Transaction ID:630d2b78-ea4d-465f-b930-6d98ac9bc05d, Customer ID: Mr. Virgil McCullough Bradtk, Reward Points: 734004.0
: Transaction ID:f3bb8a84-5388-4467-995a-9b7b291edccf, Customer ID: Elma Dickinson Grimes, Reward Points: 457885.0
: Transaction ID:ea2697da-2e6d-4c3c-b6ca-0c31470c4ace, Customer ID: Ruthann Toy McCullough, Reward Points: 241074.0
: Transaction ID:fdab377d-a31f-41a6-a2a2-b09d6c488809, Customer ID: Julio Haag Pacocha DDS, Reward Points: 649671.0
: Transaction ID:0a2dad1a-c756-4c23-a7eb-4dd3c4ca092a, Customer ID: Matilde Romaguera Schultz PhD, Reward Points: 530915.0
: Transaction ID:ba216bc7-4014-429b-a736-eaf161e06c0, Customer ID: Charley Boyer Harber, Reward Points: 298977.0
: Transaction ID:73a4333f-319a-4709-bfd3-8d0aebb0dee7, Customer ID: Mr. Jimmie Christiansen Klein, Reward Points: 446632.0
: Transaction ID:fe76550d-7a42-470e-8b45-defeffff445, Customer ID: Dr. Quincy O'Keefe Ledner, Reward Points: 344986.0
: Transaction ID:469c0ebe-5ffe-4766-8907-cc4b1f15356b, Customer ID: Shanna Welch Goldner, Reward Points: 454496.0
: Transaction ID:5a4c6412-2e52-4d6a-94d5-bb5f334b8863, Customer ID: Mr. Nakita Watsica Hermann, Reward Points: 402481.0
: Transaction ID:2ac63d5e-e10e-4ae4-9fce-2792644fca73, Customer ID: Kenneth Moore Hauck, Reward Points: 553154.0
: Transaction ID:1d6e5161-7996-4ba5-b19c-9229c887ca19, Customer ID: Isabella Dickens Rodriguez, Reward Points: 796757.0
: Transaction ID:75bb9e79-fe49-4244-a96c-d120da88aab4, Customer ID: Kerrie Hickie Hodkiewicz, Reward Points: 417205.0
: Transaction ID:cb4f39e4-e9ef-45e8-bd74-2018d9c429fe, Customer ID: Magan Graham Von MD, Reward Points: 393714.0
: Transaction ID:ae748b85-11a9-427a-969d-85d619bf73a3, Customer ID: Monty Rutherford Kohler Jr., Reward Points: 715731.0

Console
spring-batch-example-1 - TransferviseAssignmentApplication [Spring Boot App] C:\Program Files\Java\jdk1.8.0_171\bin\javaw.exe (15-Mar-2020, 7:58:57 pm)
[nio-8080-exec-1] o.s.c.c.c.[Tomcat].[localhost].[/] : Initializing Spring FrameworkServlet 'dispatcherServlet'
[nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : FrameworkServlet 'dispatcherServlet': initialization started
[nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : FrameworkServlet 'dispatcherServlet': initialization completed in 9 ms
[nio-8080-exec-1] s.o.b.c.l.support.SimpleJobLauncher : Job: [SimpleJob: [name= ]] launched with the following parameters: [(time=1584283060289)]
[nio-8080-exec-1] c.transfervise.service.CustomerListner : ..... Job created time..... Sun Mar 15 20:07:40 IST 2020
[nio-8080-exec-1] o.s.batch.core.job.SimpleStepHandler : Executing step: [class path resource [moreExamples.csv]-load]
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Expected Output as below

[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:7f793e70-5d88-4e30-b456-47086fc032f2, Customer ID: Lloyd Hill Welch, Reward Points: 794164.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:9ea8521a-e1bd-404e-8a92-0d6f66e7e727, Customer ID: Hilaria Cormier Spencer, Reward Points: 382982.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:13d4187f-44a1-43e1-8beb-1627495a03a4, Customer ID: Sung Hermiston Welch, Reward Points: 503648.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:70a49c6b-7685-4d0f-8a8d-17ae1f48970a, Customer ID: Terrance Watsica Orn, Reward Points: 326224.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:e3a905d0-d131-4ca4-9f91-252940e6c0d4, Customer ID: Marya Thiel Armstrong PhD, Reward Points: 377194.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:6997b9ee-6337-4925-b88a-d7693ae2d7ba, Customer ID: Heide Cremin Nicolas, Reward Points: 311361.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:e4468890-adbb-4c79-bc5b-bf103fe83946, Customer ID: Verna Hagenes Hackett, Reward Points: 891445.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:95b796d6-c89b-48ae-8cbd-7119046a7ae2, Customer ID: Dexter Zooncak Leannon DDS, Reward Points: 958926.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:50f925f4-3e05-4a8b-bb7d-3e8efb1703c2, Customer ID: Miss Kandy Mayer Romaguera, Reward Points: 840389.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:57d45105-887f-4b98-b6f5-c6d7346994aa, Customer ID: Rene Kohler Reichert, Reward Points: 489277.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:630d2b78-ea4d-465f-b930-6d98ac9bc05d, Customer ID: Mr. Virgil McCullough Bradtk, Reward Points: 734004.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:f3bb8a84-5388-4467-995a-9b7b291edccf, Customer ID: Elma Dickinson Grimes, Reward Points: 457885.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:ea2697da-2e6d-4c3c-b6ca-0c31470c4ace, Customer ID: Ruthann Toy McCullough, Reward Points: 241074.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:fdab377d-a31f-41a6-a2a2-b09d6c488809, Customer ID: Julio Haag Pacocha DDS, Reward Points: 649671.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:0a2dad1a-c756-4c23-a7eb-4dd3c4ca092a, Customer ID: Matilde Romaguera Schultz PhD, Reward Points: 530915.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:ba216bc7-4014-429b-a736-eaf161e06c0, Customer ID: Charley Boyer Harber, Reward Points: 298977.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:73a4333f-319a-4709-bfd3-8d0aebb0dee7, Customer ID: Mr. Jimmie Christiansen Klein, Reward Points: 446632.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:fe76550d-7a42-470e-8b45-defeffff445, Customer ID: Dr. Quincy O'Keefe Ledner, Reward Points: 344986.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:469c0ebe-5ffe-4766-8907-cc4b1f15356b, Customer ID: Shanna Welch Goldner, Reward Points: 454496.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:5a4c6412-2e52-4d6a-94d5-bb5f334b8863, Customer ID: Mr. Nakita Watsica Hermann, Reward Points: 402481.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:2ac63d5e-e10e-4ae4-9fce-2792644fca73, Customer ID: Kenneth Moore Hauck, Reward Points: 553154.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:1d6e5161-7996-4ba5-b19c-9229c887ca19, Customer ID: Isabella Dickens Rodriguez, Reward Points: 796757.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:75bb9e79-fe49-4244-a96c-d120da88aab4, Customer ID: Kerrie Hickie Hodkiewicz, Reward Points: 417205.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:cb4f39e4-e9ef-45e8-bd74-2018d9c429fe, Customer ID: Magan Graham Von MD, Reward Points: 393714.0
[nio-8080-exec-1] com.transfervise.batch.DBWriter : Transaction ID:ae748b85-11a9-427a-969d-85d619bf73a3, Customer ID: Monty Rutherford Kohler Jr., Reward Points: 715731.0
```