

Task 1

Dataset:

Assuming we are using Microsoft SQL Server Table:

Table Name: AUPINVTR

1st Column AutoID [No input need]

2nd Column SyndicateID

3rd Column InvestorID

4th Column Amount

5th Column TransectionDate

Example :

TRID	TRSYNID	TRINVID	TRAMT	TRDATE
1	1	1	500	12/31/2022
2	1	1	1000	12/31/2022
3	2	1	1234	12/31/2022
4	1	1	3450	12/31/2022
5	1	3	2232	12/31/2022
6	4	1	5678	12/31/2022

Optimize Sql Query for finding Top 5 investors who have invested in the highest number of unique syndicates along with total they have invested

```
Select top 5 t2.TRINVID,t2.total_synd,t3.total_amount from
(select t1.TRINVID,COUNT(t1.TRSYNID) total_synd from
(select Distinct TRINVID,TRSYNID from AUPINVTR) t1
group by t1.TRINVID) t2
LEFT JOIN (select TRINVID,SUM(TRAMT) total_amount from AUPINVTR group by TRINVID)
t3
on t2.TRINVID=t3.TRINVID
ORDER BY t2.total_synd desc
```

Source:

GITHUB Link: <https://github.com/rahul063020/auptimate/tree/main/Task1>

GITHUB Link (Java Code): <https://github.com/rahul063020/auptimate/tree/main/Task1/JavaCode>

SQL /Dataset link : <https://github.com/rahul063020/auptimate/blob/main/Task1/script.sql>

Import Sql into Database

Create a Database in your instance naming “MLBD”

Open new Query Manager => run the scripts

Steps to Run the Java Code:

Download / Pull Source Code

Open “application.properties” file

Give proper connection string for MSSQL Server

Go to project directory and run the below commands after one by one:

⇒ “mvn clean insatall”

⇒ “mvn spring-boot:run”

Open Swagger:

After successfully run the application

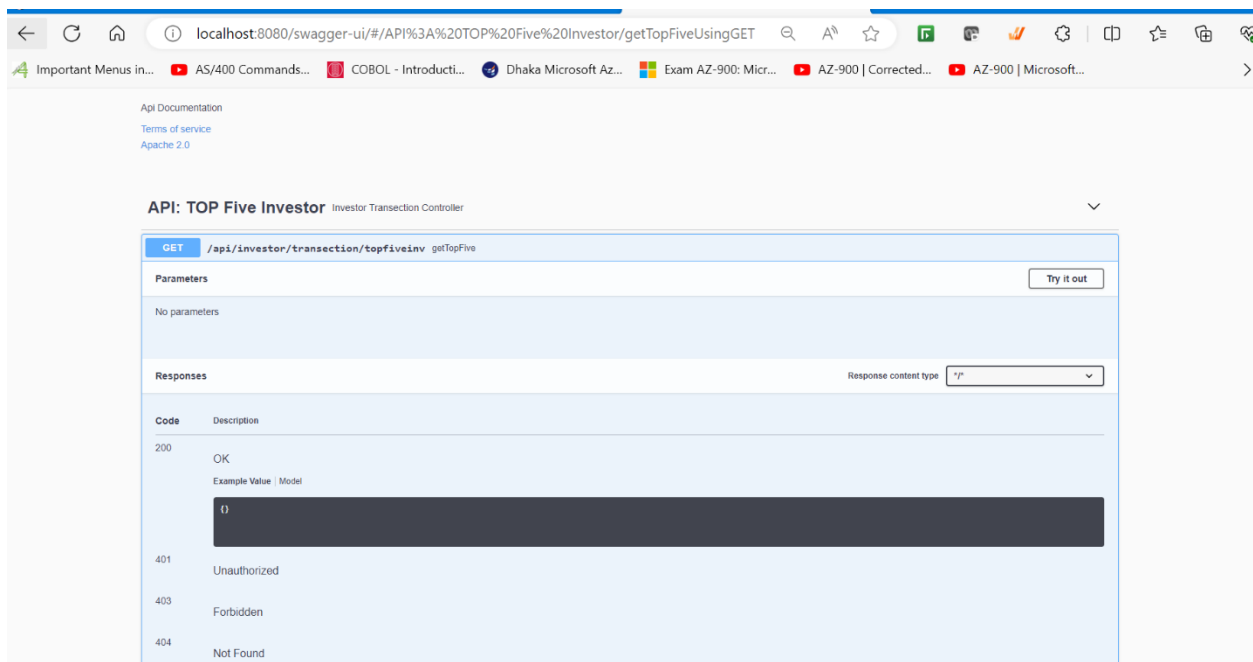
Open Browser (any) and go to the link → [Swagger UI](#)

Then click on First Navigation “API: Top Five Investor”

Select “Try IT OUT”

Select “Execute”

Then Result will be shown



GET /api/investor/transaction/topfiveinv getTopFive

Parameters

Cancel

No parameters

ExecuteClear

Responses

Response content type: */*

Curl

```
curl -X GET "http://localhost:8080/api/investor/transaction/topfiveinv" -H "accept: */*"
```

Request URL

```
http://localhost:8080/api/investor/transaction/topfiveinv
```

Server response

CodeDetails

Code	Details
200	<div><div>Response body</div><div><pre>{ { "InvestorID": 4, "TotalSydicate": 4, "TotalAmount": 400 }, { "InvestorID": 5, "TotalSydicate": 3, "TotalAmount": 300 }, { "InvestorID": 1, "TotalSydicate": 3, "TotalAmount": 11802 }, { "InvestorID": 2, "TotalSydicate": 2, "TotalAmount": 200 }, { "InvestorID": 3, "TotalSydicate": 2, "TotalAmount": 5799 } }</pre></div><div>Download</div></div> <div><div>Response headers</div><div><pre>connection: keep-alive content-type: application/json date: Fri20 Oct 2023 10:43:39 GMT keep-alive: timeout=60 transfer-encoding: chunked</pre></div></div>

Responses

TASK -2

Assuming we are using following Technologies:

- JAVA spring
 - SpringBoot
 - JPA
 - REST API
- JMS(QUEUE) [Balancing Huge Traffic]
- Mysql DB
- Configuration File [Threshold Values are defined]

Algorithm Steps:

Step 1: Make a Transection (transection method)

Data Structure:

LinkedList InklstTrn ← Data retrieve from User Input FORM
int SyndicateID
double Amount

//Save to DB

InklstTrn => Save to DB

Step 2: Function sending alert for Amount exceed the certain threshold.

Algorithm Techniques (Technology)

Spring AOP

JMS

Configuration

double threshholdValue ← Retrieve Threshold value from Configuration file for Huge Amount

Data Structure:

AOP [Asynchronous Triggering]

JMS jmsTemplate [QUEUE]

HashMap mapMSG; [Hashing & Map]

Algorithm (Logic):

AOP Configure/Attach with Transection Metod -> Step 1

- Transection_amount ← retrieve From Step1 method

Spring AOP (Before Advice):

IF Transection_amount >=0 && Transection_amount !=null &&
Type (Transection_amount) == Type.of(double)

if Transection_amount >= threshholdValue

```

        mapMSG.put("syndicate_id", "Alerting:: Huge Amount
        for this particular transection")
    ELSE
        EXIT
    Send JMS:
        jmsTemplate.convertAndsend(mapMSG);
JMS listener:
    HashMap mapSend = Getting message from JMS and convert to
    HashMap
    mapSend → Email or SMS
    Error Sending:
        • IF Wrong Email or SMS
        • Others Error

```

Step 3: Function-> Hourly Threshold function, [Background Job for finding certain amount per hour what exceed the threshold]

Algorithm Techniques (Technology)

JMS

SQL Query

Configuration

variable hourlyThTrnVlm ← Retrieve Threshold value from Configuration file for
Huge Transection

Data Structure:

LinkedList InkLstTrn [Link List]

JMS jmsTemplate [QUEUE]

HashMap mapMSG; ; [Hashing & Map]

Algorithm:

- InkLstTrn ← Find Last Hour Transections volume [using sql query]

IF InkLstTrn >=0

int countLastHourtrn= SUM(InkLstTrn)

if countLastHourtrn >= hourlyThTrnVlm

Send JMS:

mapMSG.put("Aletring:: Huge Transection last hour")

jmsTemplate.convertAndsend(mapMSG);

ELSE

Exit

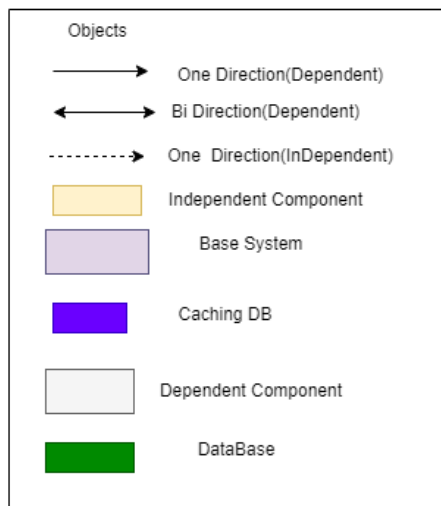
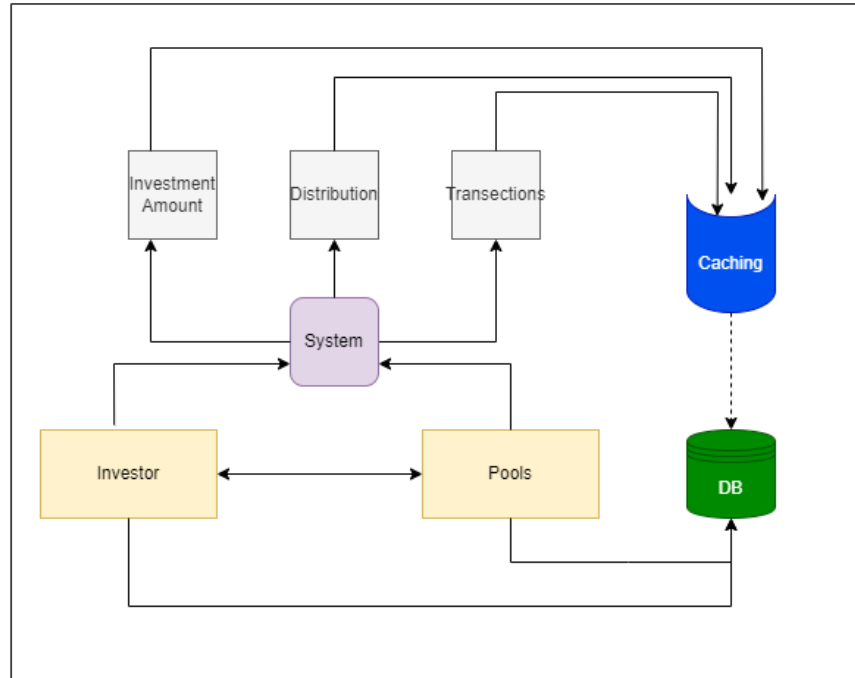
JMS listener:

HashMap mapSend = Getting message from JMS and convert to
HashMap

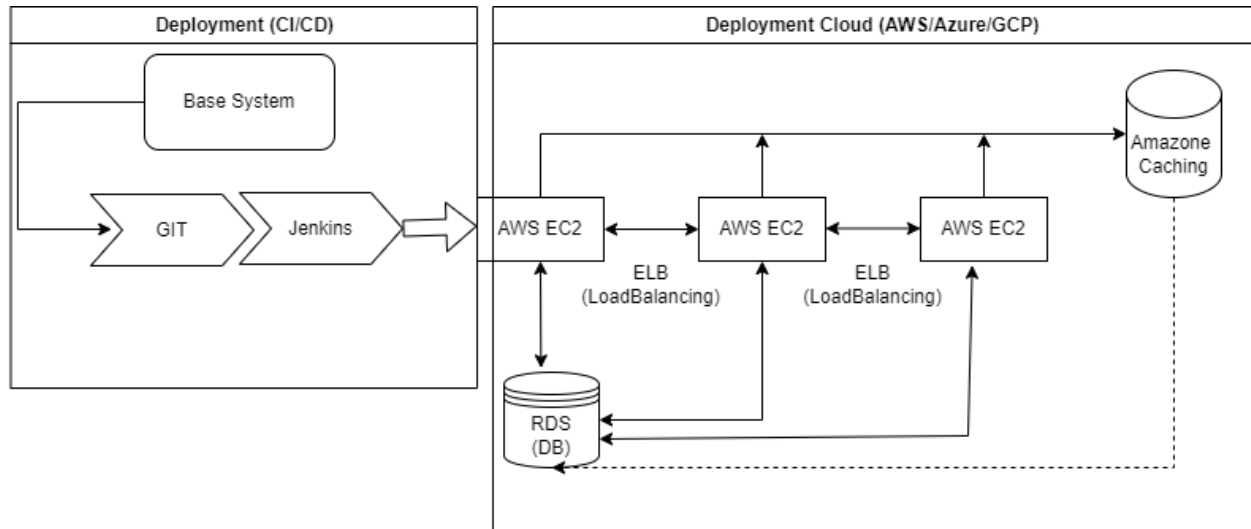
mapSend → Email or SMS

TASK 3

System Architecture



Infrastructure Architecture (Deployment Architecture)



Technology/Tools:

- Backend
 - JAVA 1.8
 - SpringBoot
 - JPA & Hibernate
 - REST API (Asynchronous) **[Reduce Wait time , Backend Work, Robustness]**
 - MySql /SQL Server /Oracle DB
 - Redis/Amazon Caching
- Frontend: Angular 12,Html,CSS
- CI/CD
 - GitLab
 - Jenkins
- Server
 - AWS (EC2)
 - ELB (Elastic Load Balancing) **[Scalability]**

Bottlenecks

Clarification: I need more clarity about what distributor & pools how they are connected each other. What their dependency so I can build more efficient architecture

Problem: IF user delete a pool or distributor, what will happen with the transections which have been created under the pool or distributor. It will become an orphan transection.

Question: How the transaction will be made? Does transaction will be done from Online ?. I mean like wallet transfer, Bank transfer [any auto transaction] .If so I need more details on that.

