

ATM MANAGEMENT SYSTEM

PRESENTED BY: ENGR. MUHAMMAD MANSOOR



PROBLEM STATEMENT:

- THE CURRENT ATM MANAGEMENT SYSTEM HAS SEVERAL ISSUES SUCH AS LONG QUEUES, SLOW PROCESSING, FREQUENT DOWNTIME, AND LIMITED FUNCTIONALITIES. THESE ISSUES HAVE RESULTED IN POOR CUSTOMER EXPERIENCE AND LOSS OF BUSINESS FOR THE BANKS.
- THE GOAL OF THIS PROJECT IS TO DEVELOP A NEW ATM MANAGEMENT SYSTEM THAT ADDRESSES THESE ISSUES AND PROVIDES AN IMPROVED CUSTOMER EXPERIENCE. THE SYSTEM SHOULD BE ABLE TO HANDLE A LARGE NUMBER OF TRANSACTIONS QUICKLY AND EFFICIENTLY, PROVIDE A WIDE RANGE OF FUNCTIONALITIES, AND ENSURE HIGH UPTIME AND AVAILABILITY.
- THE SYSTEM SHOULD ALSO INCLUDE FEATURES SUCH AS ADVANCED SECURITY MEASURES TO PREVENT FRAUDULENT ACTIVITIES, USER-FRIENDLY INTERFACES TO ENSURE EASE OF USE FOR CUSTOMERS, AND REAL-TIME MONITORING TO ENABLE QUICK RESPONSE TO ANY ISSUES.
- THE PROJECT WILL INVOLVE DESIGNING AND DEVELOPING THE NEW SYSTEM, INTEGRATING IT WITH THE EXISTING BANKING SYSTEMS, AND ENSURING ITS SEAMLESS OPERATION. THE SYSTEM SHOULD ALSO BE SCALABLE AND ADAPTABLE TO ACCOMMODATE FUTURE CHANGES AND ADVANCEMENTS IN TECHNOLOGY.

SCOPE OF WORK:

Release I • Selection of Functionalities	Release II • Selection of User Stories	Release III • Implementation of selected functionalities using assigned tools	Release IV • Selection of Test cases and their implementation.
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PROJECT STRUCTURE:

Sr.No	Roles	Name
1	Engagement Manager	Jawad Naeem
2	Project Manager	Muhammad Ateeb
3	Software Engineer	Muhammad Mansoor
4	Environment	Contour Software

STAKE HOLDERS (PRIMARY):

Sr.	Primary
1	Project Manager
2	Business Analyst
3	Developers
4	Quality Assurance Engineers
5	UI Designers
6	UX Designers
7	INTERNET

STAKE HOLDERS (SECONDARY):

Sr.	Secondary
1	Customers
2	Banks
3	State Bank of Pakistan
4	Ministry of Finance
5	Cybersecurity Wings
6	Card Merchants
7	Other Fintech Application Providers

FUNCTIONALITIES:

Sr. No	Functionality	Sub Functionality
1	Authentication with Login	<ul style="list-style-type: none">• Card along pin is verified.• Biometric Recognition with pin is supported.
2	Cash Withdrawal	<ul style="list-style-type: none">• Cash Withdrawal with assigned limits• Free of Cost at same bank ATM• With Charges at different bank ATM
3	Balance Inquiry	<ul style="list-style-type: none">• Free of Cost At same bank's ATM• With Charges at a different bank ATM
4	Cash Deposit	<ul style="list-style-type: none">• Cash Deposit with assigned limits• Free of Cost at same banks ATMS

FUNCTIONALITIES (CONT):

Sr. No	Functionality	Sub-Functionality
5	Update Pin	<ul style="list-style-type: none">• Pin can be updated on same banks ATM
6	Maintains Transaction Records	<ul style="list-style-type: none">• Transaction Records for each customer are maintained
7	Bill payments	<ul style="list-style-type: none">• Bill Payments for Electricity, Gas , Water Telephone etc
8	Funds Transfer to other Accounts	<ul style="list-style-type: none">• Funds Transfer to other accounts within the bank

USER STORIES:

Story ID	As	Wants to	So that they can
UT-01	Customer	Log in to ATM using card	Perform a transaction
UT-02	Customer	Check balance	To view their current available balance
UT-03	Customer	Withdraw Cash	Fulfil their needs with directly going to bank 'counter.
UT-04	Customer	Deposit Cash	So amount can be deposited in bank account without specifically going to bank's counter
UT-05	Customer	Update Pin	Replace their previous insecure pin with a new one in a hassle free way.

USER STORIES (CONT):

Story ID	As	Wants to	So that they can
UT-06	Customer	Pay bills	Avoid long queues
UT-07	Customer	Transfer funds within same bank	Transfer funds to other bank accounts within the same bank and avoid counters and deposit slip issues.
UT-08	Customer	Transfer funds to other bank	Transfer funds to other bank accounts and avoid counters and deposit slip issues.
UT-09	Customer	Login using biometric and pin	Avoid debit cards.
UT-10	Customer	Needs mini bank statement	View their transaction history

IMPLEMENTED FUNCTIONALITIES:

- LOGIN WITH CREDENTIALS
- BALANCE INQUIRY AT SAME BANK'S ATM
- CASH WITHDRAWAL AT SAME BANK'S ATM
- CASH DEPOSIT AT SAME BRANCH
- UPDATE PIN AT SAME BRANCH
- TRANSACTION LIST

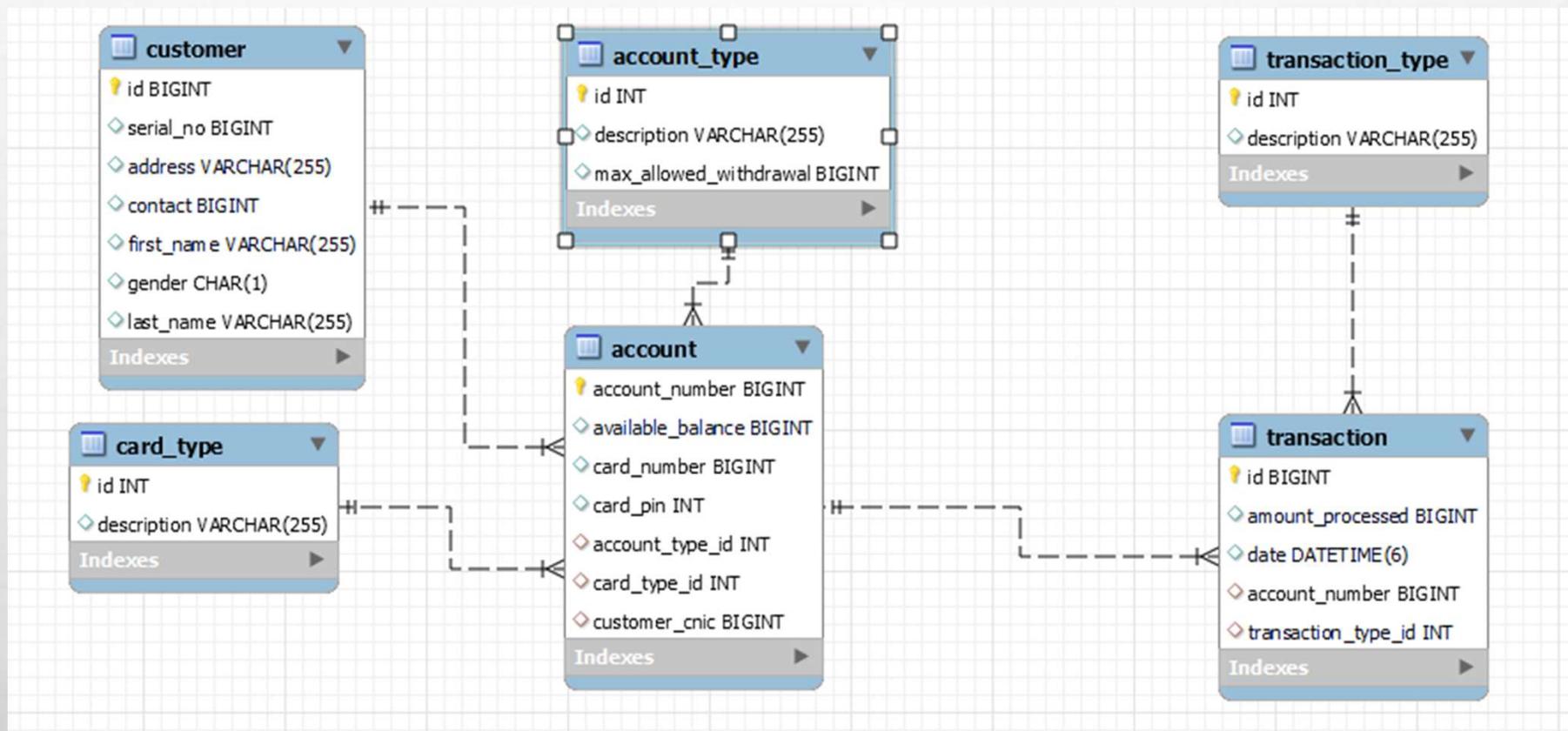
TEST CASES:

- Login with correct credentials(Card Number and Pin)
- Login with incorrect credentials
- Balance Check
- Cash Withdrawal beyond limits
- Cash withdrawal within limits
- Cash Deposit Beyond Limits
- Cash Deposit within limits
- Update Pin by a new pin
- Update Pin with existing pin
- Implementing any of the test case without Login

TOOLS USED:

- JAVA
- MySQL
- Spring Boot
- JPA & Hibernate
- Spring security
- Swagger
- Postman
- REST API
- Junit testing
- IntelliJ Idea Ultimate
- MySQL work bench
- Thymleaf

ERD DIAGRAM FOR RELATIONS:



UML DIAGRAMS:



BalanceCheckService

```
«Autowired»  
AccountRepository accountRepository  
«Autowired»  
TransactionRepository transactionRepository  
«Autowired»  
TransactionTypeRepository typeRepository  
«Autowired»  
TransactionService transactionService  
«Autowired»  
AccountDataService accountDataService  
  
□ modelData: ModelData  
□ login: Login  
  
● getAvailableBalance(): String
```



LoginService

```
«Autowired»  
AccountRepository accountRepository  
«Autowired»  
AccountDataService accountDataService  
  
□ account: Account  
□ login: Login  
  
● authenticateLogin(modelCardNumber: Long, modelCardPin: Long): String  
● exit(): void
```



SWAGGER



http://localhost:8090 - Generated server url ▾

cash-withdrawal-controller ^

PUT /atm/withdraw-cash/{amount} ▾

update-pin-controller ^

PUT /atm/update-pin/{pin} ▾

cash-deposit-controller ^

PUT /atm/deposit-cash/{amount} ▾

login-controller ^

GET /atm/login/{modelCardNumber}/{modelCardPin} ▾

balance-check-controller ^

GET /atm/balance-inquiry ▾

IMPLEMENTING TEST CASES:



WRONG CREDENTIALS

Home Workspaces API Network Explore

Search Postman

Invite Settings Notifications Upgrade

My Workspace New Import Overview GET http://localhost:8090/atm/login/123456789/12345 GET http://localhost:8090/atm/login/123456789/12345 PUT http://localhost:8090/atm/login/123456789/12345 PUT http://localhost:8090/atm/login/123456789/12345 + ... No Environment

Collections APIs Environments Mock Servers Monitors Flows History

No APIs yet

APIs define related collections and environments under a consistent schema.

Create an API

http://localhost:8090/atm/login/123456789/12345

GET http://localhost:8090/atm/login/123456789/12345

Params Authorization Headers (6) Body Pre-request Script Tests Settings Cookies

Query Params

Key	Value	Description	...	Bulk Edit
Key	Value	Description		

Body Cookies Headers (5) Test Results

Status: 200 OK Time: 462 ms Size: 183 B Save as Example

Pretty Raw Preview Visualize Text

1 Invalid Credentials

Start working with APIs

67%

Next: Save requests. Show me

Online Find and Replace Console Cookies Capture requests Runner Trash

http://localhost:8090/atm/login/123456789/12345

1 Invalid Credentials

The screenshot shows the Postman application interface. The left sidebar has a tree view with 'My Workspace' selected, showing 'Collections', 'APIs' (which is currently active), 'Environments', 'Mock Servers', 'Monitors', 'Flows', and 'History'. A central panel displays a 'GET' request to `http://localhost:8090/atm/login/12345678/1234`. The 'Params' tab is selected, showing a single entry: 'Key' (empty) and 'Value' (empty). Below the table are tabs for 'Body', 'Cookies', 'Headers (5)', and 'Test Results'. The 'Body' tab is selected, showing the response status as 'Status: 200 OK' and the body content: '1 Invalid Credentials'. The bottom navigation bar includes icons for 'Online', 'Find and Replace', 'Console', 'Cookies', 'Capture requests', 'Runner', 'Trash', and a search bar.

≡ ⌛ Home Workspaces API Network Explore Search Postman Invite ⚙️ 🔔 Upgrade ×

My Workspace New Import Overview GET http://localhost:8090/atm/login/12345678/1234 GET http://localhost:8090/atm/login/12345678/1234 PUT http://localhost:8090/atm/login/12345678/1234 PUT http://localhost:8090/atm/login/12345678/1234 + ⚙️ No Environment ↻ Save ⚙️ 🔍 ↻ Send ⚙️ 🌟

collections + ⚙️

No APIs yet

APIs define related collections and environments under a consistent schema.

Create an API

Body Cookies Headers (5) Test Results

1 Invalid Credentials

Status: 200 OK Time: 62 ms Size: 183 B Save as Example

Pretty Raw Preview Visualize Text ⚙️

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Cookies Capture requests Runner Trash

Windows Search File Mail Browser Icons 11:20 PM ENG 15-Apr-23 6

The background of the image is a complex, abstract pattern resembling a topographic map or a microscopic view of a material. It features a dense network of fine lines in shades of red, green, and black, creating a sense of depth and movement. The colors transition from deep reds and blacks in the darker areas to bright greens and whites in the lighter, more turbulent regions. The overall effect is organic and dynamic.

BALANCE INQUIRY

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Search Postman

Invite Settings Notifications Upgrade

My Workspace New Import Overview GET http://localhost:8090/atm/balance-inquiry GET http://localhost:8090/atm/balance-inquiry PUT http://localhost:8090/atm/balance-inquiry PUT http://localhost:8090/atm/balance-inquiry + ... No Environment

Collections APIs Environments Mock Servers Monitors Flows History

No APIs yet

APIs define related collections and environments under a consistent schema.

Create an API

http://localhost:8090/atm/balance-inquiry

GET http://localhost:8090/atm/balance-inquiry

Params Authorization Headers (6) Body Pre-request Script Tests Settings Cookies

Query Params

Key	Value	Description	Bulk Edit
Key	Value	Description	

Body Cookies Headers (5) Test Results

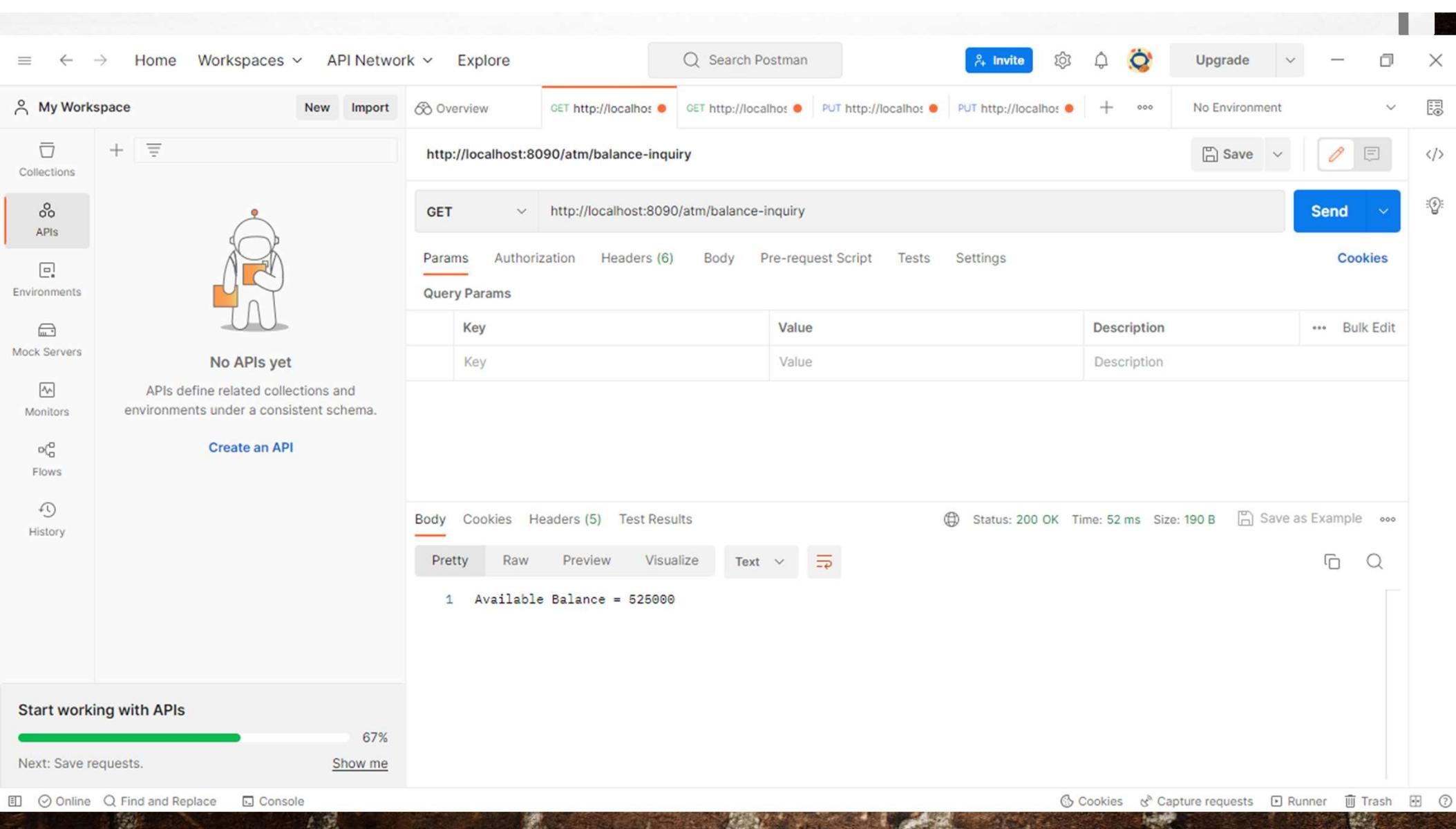
Status: 200 OK Time: 52 ms Size: 190 B Save as Example

Pretty Raw Preview Visualize Text

1 Available Balance = 525000

Start working with APIs 67% Next: Save requests. Show me

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EXCEEDING WITHDRAWAL LIMIT

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New Import Overview GET http://localhost:8080/ GET http://localhost:8080/ PUT http://localhost:8080/ PUT http://localhost:8080/ + ... No Environment

Collections

APIs

Environments

Cloud Servers

Monitors

Flows

History

No APIs yet

APIs define related collections and environments under a consistent schema.

Create an API

http://localhost:8090/atm/withdraw-cash/26000

PUT http://localhost:8090/atm/withdraw-cash/26000

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

Query Params

	Key	Value	Description	... Bulk Edit
	Key	Value	Description	

Body Cookies Headers (5) Test Results

Status: 200 OK Time: 28 ms Size: 208 B Save as Example

Pretty Raw Preview Visualize Text

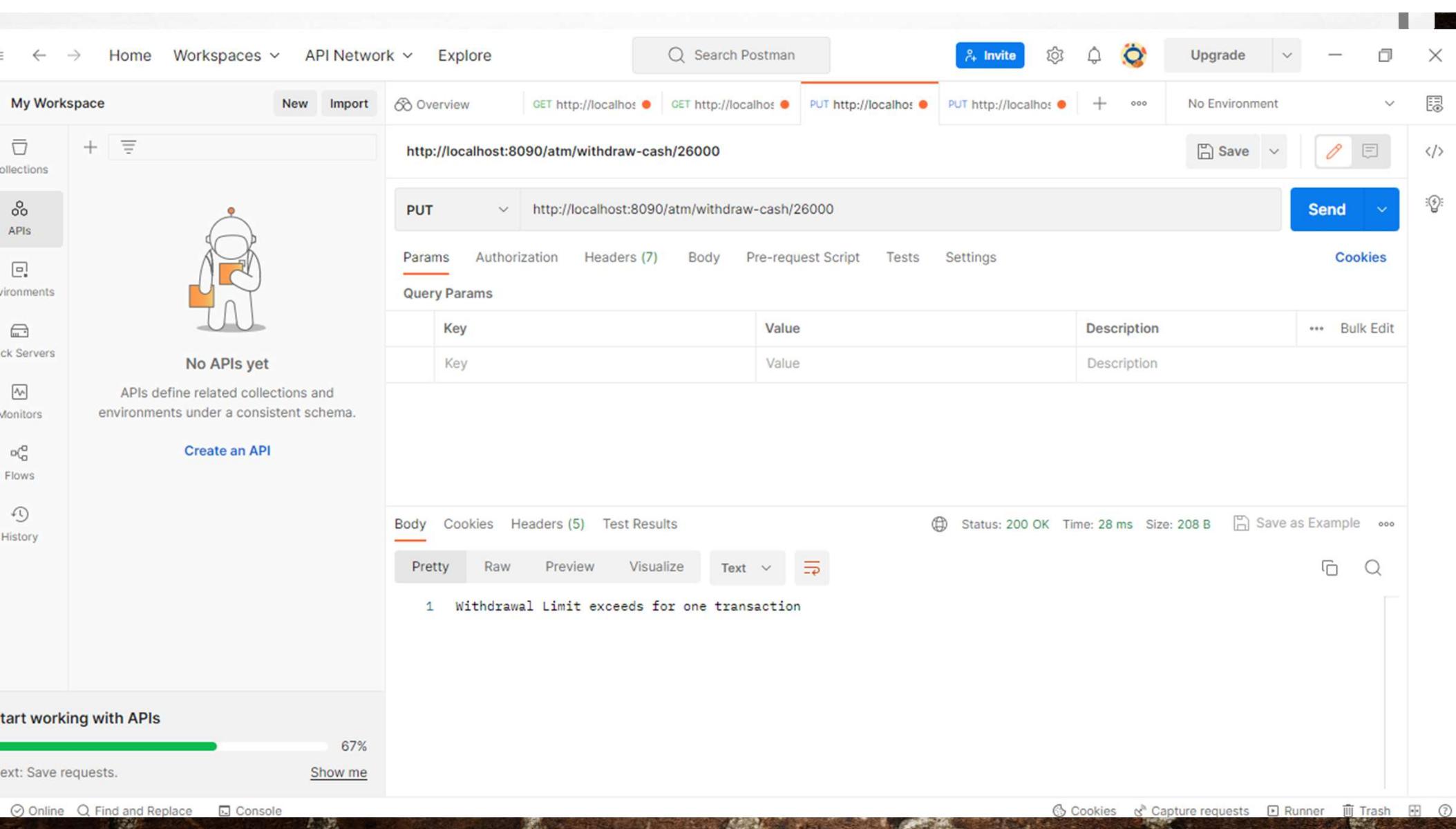
1 Withdrawal Limit exceeds for one transaction

Start working with APIs

67%

ext: Save requests. Show me

Online Find and Replace Console Cookies Capture requests Runner Trash



SUCCESSFUL WITHDRAW

Home Workspaces API Network Explore

Search Postman

Invite Settings Bell Upgrade

New Import Overview GET http://localhost:8090/ GET http://localhost:8090/ PUT http://localhost:8090/ PUT http://localhost:8090/ + ... No Environment

Save

PUT http://localhost:8090/atm/withdraw-cash/25000

Send

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

No APIs yet

APIs define related collections and environments under a consistent schema.

Create an API

Body Cookies Headers (5) Test Results

Status: 200 OK Time: 53 ms Size: 193 B Save as Example

Pretty Raw Preview Visualize Text

1 25000 withdrawn successfully

Start working with APIs

67%

Next: Save requests. Show me

Online Find and Replace Console Cookies Capture requests Runner Trash



TRANSACTION HISTORY IN RDBMS

```
1 •  SELECT t.id,t.amount_processed,t.date,t.account_number,tt.description  
2   | FROM atm.transaction t,transaction_type tt  
3   | where t.transaction_type_id=tt.id;
```

< []

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

	id	amount_processed	date	account_number	description
▶	1	0	2023-04-16 06:19:09.270000	1977900982903	Balance Inquiry
	2	0	2023-04-16 06:20:19.270000	1977900982903	Update Pin
	3	25000	2023-04-16 06:23:16.270000	1977900982903	Withdraw
	4	25000	2023-04-16 06:24:09.270000	1977900982903	Cash Deposit

OUT OF SCOPE:

- Login with biometric
- Balance inquiry at different bank's ATM
- Cash withdrawal at different bank's ATM
- Cash deposit at different bank's atm
- Update pin at different bank's atm
- Bill payments
- Funds transfer to other accounts
- Further implementation of spring security
- Further implementation of frontend technologies

FUTURE WORK:

- All the out of scope functionalities.
- Further Enhancements related to Security and Front-End



ANY?

QUESTIONS

THANK YOU