

Cryptocurrency_MultiCoinTracker - User Manual

https://github.com/Js24zz/Cryptocurrency_MultiCoinTracker.git

Section 1 (System Overview)

This system automatically:

- 1) Collects cryptocurrency market data from **CoinGecko API**.
- 2) Parses JSON using **jq**.
- 3) Stores historical data in **MySQL**.
- 4) Generates **time-series plots**.
- 5) Runs automatically via cron **(Malaysia time, UTC+8)**.

The system tracks **10 major cryptocurrencies**, with **additional metrics (24h change, market cap, volume)** for Bitcoin and Ethereum.

Section 2 (Project Folder Structure)

```
acker$ tree
.
├── .DS_Store
├── .git
├── .gitignore
├── .github
├── .vscode
├── Data
│   ├── crypto_20251211T225430.json
│   ├── crypto_20251211T225831.json
│   ├── crypto_20251211T230808.json
│   ├── crypto_20251211T231353.json
│   ├── crypto_20251212T000001.json
│   ├── crypto_20251212T001335.json
│   ├── crypto_20251212T002735.json
│   ├── crypto_20251212T120001.json
│   ├── crypto_20251212T123001.json
│   ├── crypto_20251212T130001.json
│   ├── crypto_20251212T133001.json
│   ├── crypto_20251212T140001.json
│   ├── crypto_20251212T210002.json
│   ├── crypto_20251213T000001.json
│   ├── crypto_20251213T120001.json
│   ├── crypto_20251213T123001.json
│   ├── crypto_20251213T130001.json
│   ├── crypto_20251213T133001.json
│   ├── crypto_20251213T140001.json
│   ├── crypto_20251213T210001.json
│   ├── crypto_20251214T000002.json
│   ├── crypto_20251214T120001.json
│   ├── crypto_20251214T123000.json
│   ├── crypto_20251214T130000.json
│   ├── crypto_20251214T133001.json
│   ├── crypto_20251214T140000.json
│   ├── crypto_20251214T210001.json
│   ├── crypto_20251214T210846.json
│   ├── crypto_20251215T000001.json
│   └── crypto_20251215T010501.json
├── Documents
│   ├── CryptoPricesTable.txt
│   ├── Documentation.pdf
│   ├── ERD.drawio.pdf
│   └── UserManual.pdf
├── Logs
│   ├── collect_crypto.log
│   ├── cron_all.log
│   ├── cron_collect.log
│   ├── cron_plot.log
│   └── plot_crypto.log
├── Plots
│   ├── ADA_price.png
│   ├── BNB_price.png
│   ├── BTC_change24.png
│   ├── BTC_marketcap.png
│   ├── BTC_price.png
│   ├── BTC_volume24h.png
│   ├── DOGE_price.png
│   ├── ETH_change24.png
│   ├── ETH_marketcap.png
│   ├── ETH_price.png
│   ├── ETH_volume24h.png
│   ├── LINK_price.png
│   ├── LTC_price.png
│   ├── SOL_price.png
│   ├── TRX_price.png
│   └── XRP_price.png
├── README.md
├── Schema.sql
├── Scripts
│   ├── AppendCleanTable.sh
│   ├── CollectCrypto.sh
│   ├── HealthCheck.sh
│   ├── PlotCrypto.sh
│   └── ShowLatestPrices.sh
└── Sql
    └── Schema.sql
```

Section 3 (Environment Setup)

Required software:

- a) Windows + WSL (Ubuntu)
- b) MySQLServer
- c) Jq
- d) Curl
- e) Python (for plotting)

```
yeonj@WIN-R02UQQ0R3FN:/mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ mysql --version
mysql Ver 8.0.44-0ubuntu0.24.04.1 for Linux on x86_64 ((Ubuntu))
yeonj@WIN-R02UQQ0R3FN:/mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ jq --version
jq-1.7
```

Section 4 (Database Setup)

Import Schema

```
yeonj@WIN-R02UQQ0R3FN:/mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker
sudo mysql < sql/Schema.sql
```

Section 5 (Data Collection (CollectCrypto.sh))

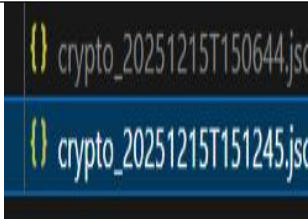
What it does:

- a) Calls **CoinGecko API**
- b) Saves raw JSON to **Data/**
- c) Creates a new snapshot row
- d) Parses values using **jq**
- e) Inserts **10 rows** into **coin_prices**

Manual Run

bash Scripts/CollectCrypto.sh

```
ency_MultiCoinTracker$ bash Scripts/CollectCr
2025-12-15T15:12:45 Downloading data from Coi
1)...
2025-12-15T15:12:46 Saved pretty JSON to /mnt
OneDrive/Cryptocurrency_MultiCoinTracker/Data
5T151245.json
2025-12-15T15:12:46 Using snapshot_id=63
2025-12-15T15:12:46 Inserted data for snapsho
Done: collected cryptocurrency data at 202512
yeonj@WIN-R02UQQ0R3FN:/mnt/c/Users/yeonj/OneD
ency_MultiCoinTracker$
```



Section 6 (JSON Parsing with jq)

Purpose

- a) jq extracts required fields from **CoinGecko JSON** before inserting into **MySQL**.
- b) bash **Scripts/AppendCleanTable.sh**

```
=====
Crypto Prices Snapshot: 2025-12-15 01:05:07
Source JSON: crypto_20251215T010501.json
```

ID	Symbol	Name	Price_USD	Market_Cap	Volume_24h	High_24h	Low_24h	Change_24h%
bitcoin	btc	Bitcoin	88972	1775302462443	33966432815	90469	88776	-1.2474
ethereum	eth	Ethereum	3098.83	374210364087	13091538578	3127.96	3073.73	-0.21678
binancecoin	bnb	BNB	886.91	122159566116	916805575	899.16	883.97	-1.25116
ripple	xrp	XRP	2.0	120535802275	1414562384	2.03	1.99	-1.34671
solana	sol	Solana	131.0	73629419626	2529517710	133.48	130.58	-1.56977
tron	trx	TRON	0.276664	26195065366	488479869	0.276645	0.27081	1.69322
dogecoin	doge	Dogecoin	0.135525	22754908298	617453436	0.139435	0.135192	-2.80447
cardano	ada	Cardano	0.39967	14647897856	479008955	0.411994	0.398986	-2.99125
chainlink	link	Chainlink	13.49	9403022778	319589150	13.78	13.45	-1.96144
litecoin	ltc	Litecoin	79.35	6080058013	334924744	81.91	78.88	-3.12425

Section 7 Plot Generation (PlotCrypto.sh)

What it generates:

Category	Output
Price Plots	10 price plots (one per cryptocurrency)
BTC Extra Plots	24h Price Change
	Market Capitalisation
	24h Trading Volume
ETH Extra Plots	24h Price Change
	Market Capitalisation
	24h Trading Volume

a) Bash **ls -t Data/*.json | head -1** to find the latest file.

```
yeonj@WIN-R02UQQ0R3FN:/mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ ls -t Data/*.json | head -1
Data/crypto_20251215T151245.json
```

b) Then bash

```
jq -r '.[[] |
[id, .symbol, .current_price, .market_cap,
.total_volume, .low_24h, .high_24h,
.price_change_percentage_24h] | @tsv' Data/crypto_20251215T151245.json |
head
```

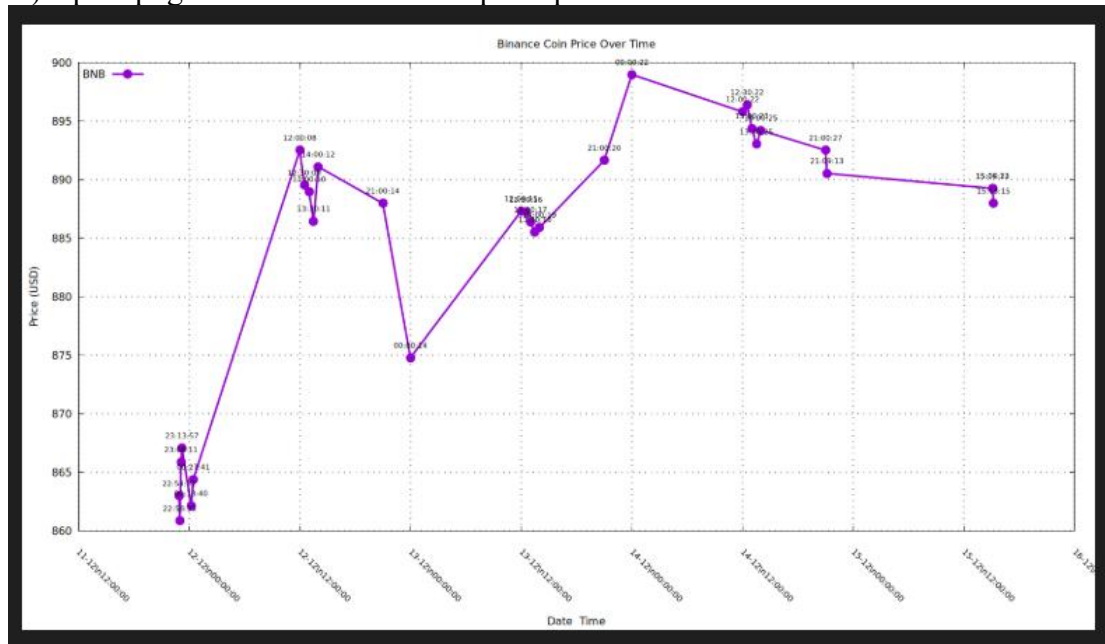
*** PLEASE NOTE THAT THE ONE IN BOLD U MUST CHOOSE THE LATEST FILE THAT SHOWN ACCORDING TO THE CIRCLED.**

```
yeonj@WIN-R02UQQ0R3FN:/mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ jq -r '.[[] |
[id, .symbol, .current_price, .market_cap,
.total_volume, .low_24h, .high_24h,
.price_change_percentage_24h] | @tsv' Data/crypto_20251215T151245.json | head
bitcoin btc      89571  1789152744859  35745452600  87892  90266  -0.64876
ethereum eth      3126.99 377905959389  21747040734  3052.44 3141.86 0.54365
binancecoin bnb     887.96 122449080489  1272407095   874.45 898.3  -0.57727
ripple xrp      2.0    120996656954  1962244617   1.98    2.02   -0.96725
solana sol     132.16 74362547019   3370352037   129.28 133.42 -0.61062
tron trx        0.281379 26636549898  676172359    0.274157 0.282445 2.61658
dogecoin doge    0.136528 22960749346  1012428477   0.1338 0.13835 -1.17378
cardano ada     0.403394 14829739828  601441687    0.395047 0.409333 -1.07476
chainlink link    13.59 9501067796   454151203    13.26 13.74 -0.78597
litecoin ltc     80.87 6207407556   426748792    78.32 81.16 -0.04052
yeonj@WIN-R02UQQ0R3FN:/mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$
```


C) bash Scripts/PlotCrypto.sh

```
yeonj@WIN-R02UQ083FN: /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ bash Scripts/PlotCrypto.sh
2025-12-15T15:26:59 Generating price plots for 10 cryptocurrencies...
2025-12-15T15:26:59 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BTC_price.png
2025-12-15T15:26:59 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ETH_price.png
2025-12-15T15:26:59 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/SOL_price.png
2025-12-15T15:27:00 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BNB_price.png
2025-12-15T15:27:00 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/XRP_price.png
2025-12-15T15:27:00 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ADA_price.png
2025-12-15T15:27:00 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/DOGE_price.png
2025-12-15T15:27:00 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/TRX_price.png
2025-12-15T15:27:00 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/LINK_price.png
2025-12-15T15:27:00 Saved price plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/LTC_price.png
2025-12-15T15:27:00 Generating 24h change plots (BTC, ETH)...
2025-12-15T15:27:00 Saved 24h change plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BTC_change24.png
2025-12-15T15:27:00 Saved 24h change plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ETH_change24.png
2025-12-15T15:27:00 Generating market cap plots (BTC, ETH)...
2025-12-15T15:27:01 Saved market cap plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BTC_marketcap.png
2025-12-15T15:27:01 Saved market cap plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ETH_marketcap.png
2025-12-15T15:27:01 Generating 24h volume plots (BTC, ETH)...
2025-12-15T15:27:01 Saved 24h volume plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BTC_volume24h.png
2025-12-15T15:27:01 Saved 24h volume plot → /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ETH_volume24h.png
2025-12-15T15:27:01 Finished generating plots.
```

D) Open .png file to check the latest plot update.



Section 8 Manual Verification Script (ShowLatestPrices.sh)

Provides human-readable verification of latest snapshot data.

a) bash Scripts/ShowLatestPrices.sh

```
yeonj@WIN-R02UQQ0R3FN: /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ Scripts/ShowLatestPrices.sh
```

Snapshot_Time	Coin	Price_USD	Low_24h_USD	High_24h_USD	Change_24h_Pct
2025-12-15 15:12:45	ADA	0.40339400	0.39504700	0.40933300	-1.07
2025-12-15 15:12:45	BNB	887.96000000	874.45000000	898.30000000	-0.58
2025-12-15 15:12:45	BTC	89571.00000000	87892.00000000	90266.00000000	-0.65
2025-12-15 15:12:45	DOGE	0.13652800	0.13380000	0.13835000	-1.17
2025-12-15 15:12:45	ETH	3126.99000000	3052.44000000	3141.86000000	0.54
2025-12-15 15:12:45	LINK	13.59000000	13.26000000	13.74000000	-0.79
2025-12-15 15:12:45	LTC	80.87000000	78.32000000	81.16000000	-0.04
2025-12-15 15:12:45	SOL	132.16000000	129.28000000	133.42000000	-0.61
2025-12-15 15:12:45	TRX	0.28137900	0.27415700	0.28244500	2.62
2025-12-15 15:12:45	XRP	2.00000000	1.98000000	2.02000000	-0.97

Section 9 Clean Output Table (AppendCleanTable.sh)

Creates a formatted snapshot table from the latest JSON.

a) bash Scripts/AppendCleanTable.sh

```
=====
Crypto Prices Snapshot: 2025-12-15 01:05:07
Source JSON: crypto_20251215T010501.json
```

ID	Symbol	Name	Price_USD	Market_Cap	Volume_24h	High_24h	Low_24h	Change_24h%
bitcoin	btc	Bitcoin	88972	1775302462443	33966432815	90469	88776	-1.2474
ethereum	eth	Ethereum	3098.83	374210364087	13091538578	3127.96	3073.73	-0.21678
binancecoin	bnb	BNB	886.91	122159566116	916805575	899.16	883.97	-1.25116
ripple	xrp	XRP	2.0	120535802275	1414562384	2.03	1.99	-1.34671
solana	sol	Solana	131.0	73629419626	2529517710	133.48	130.58	-1.56977
tron	trx	TRON	0.276664	26195065366	488479869	0.276645	0.27081	1.69322
dogecoin	doge	Dogecoin	0.135525	22754908298	617453436	0.139435	0.135192	-2.80447
cardano	ada	Cardano	0.39967	14647897856	479008955	0.411994	0.398986	-2.99125
chainlink	link	Chainlink	13.49	9403922778	319589150	13.78	13.45	-1.96144
litecoin	ltc	Litecoin	79.35	6080058013	334924744	81.91	78.88	-3.12425

Section 10 Health Check (HealthCheck.sh)

Confirms pipeline integrity

- a) Snapshots exist
- b) Exactly 10 rows per snapshot
- c) Plot files exist
- d) Clean table updated
- e) bash **Scripts/HealthCheck.sh**

```
[4] Plot outputs
Total PNG plots: 16
latest 8 plots:
-rwxrwxrwx 1 yeonj yeonj 72889 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ETH_volume24h.png
-rwxrwxrwx 1 yeonj yeonj 94342 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BTC_volume24h.png
-rwxrwxrwx 1 yeonj yeonj 74159 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ETH_marketcap.png
-rwxrwxrwx 1 yeonj yeonj 78152 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BTC_marketcap.png
-rwxrwxrwx 1 yeonj yeonj 180854 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/ETH_change24.png
-rwxrwxrwx 1 yeonj yeonj 96792 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/BTC_change24.png
-rwxrwxrwx 1 yeonj yeonj 86544 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/LTC_price.png
-rwxrwxrwx 1 yeonj yeonj 98966 Dec 15 01:05 /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker/Plots/LINK_price.png

[5] Clean table file (last 20 lines)

=====
Crypto Prices Snapshot: 2025-12-15 01:05:07
Source JSON: crypto_20251215T010501.json

ID          Symbol  Name          Price_USD  Market_Cap  Volume_24h  High_24h  Low_24h  Change_24h%
-----
bitcoin     btc      Bitcoin       88972      1775302462443  33966432815  90469      88776      -1.2474
ethereum    eth      Ethereum      3098.83    374210364087  13091538578  3127.96    3073.73    -0.21678
binancecoin bnb      BNB           886.91     122159566116  916805575    899.16     883.97     -1.25116
ripple      xrp      XRP           2.0        120535802275  1414562384    2.03       1.99       -1.34671
solana      sol      Solana        131.0      73629419626   2529517710    133.48     130.58     -1.56977
tron        trx      TRON          0.276664   26195065366   488479869     0.276645   0.27081    1.69322
dogecoin    doge     Dogecoin      0.135525   22754908298   617453436     0.139435   0.135192   -2.80447
cardano     ada      Cardano       0.39967    14647897856   479008955     0.411994   0.398986   -2.99125
chainlink   link     Chainlink     13.49      9403922778    319589150     13.78      13.45     -1.96144
litecoin    ltc      Litecoin      79.35      6080058013    334924744     81.91      78.88     -3.12425

[?] Health check complete.
```

Section 11 Automation with Cron (Malaysia Time)

Cron schedule rationale

- a) 12:00, 12:30, 13:00, 13:30, 14:00 (lunch/rest)
- b) 21:00 (after work / OT)
- c) 00:00 (start of new day)
- d) 01:05 (checking for new day)

Chosen to align with working adult usage patterns.

e) Bash `sudo crontab -l`

```
yeonj@MTN-R02UQ0R3FN: /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker$ sudo crontab -l
# == CRYPTO PIPELINE (MYT UTC+8) ==

# 12:00
0 12 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/Appen
dCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1

# 12:30
30 12 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/App
endCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1

# 13:00
0 13 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/Appen
dCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1

# 13:30
30 13 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/App
endCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1

# 14:00
0 14 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/Appen
dCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1

# 21:00
0 21 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/Appen
dCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1

# 00:00
0 0 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/Appen
dCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1

# 01:05
5 1 * * * cd /mnt/c/Users/yeonj/OneDrive/Cryptocurrency_MultiCoinTracker && bash Scripts/CollectCrypto.sh && bash Scripts/PlotCrypto.sh && bash Scripts/Appen
dCleanTable.sh && bash Scripts/HealthCheck.sh >> Logs/cron_all.log 2>&1
```

Section 12 ERD Diagram (Database Design)

What to Include

- a) coins (master)
- b) snapshots (time dimension)
- c) coin_prices (fact table)
- d) PK, FK, UNIQUE constraint

