

Problem Statement:

You are working on a project that analyzes crypto currencies data and the requirement is to process historical price list of currencies provided by a currency exchange. A sample data set Below shows prices, market cap of BTC, ETH, BNB, EOS Tezos and other crypto currencies at various times from December to October 2019.






	Currency	Date	Open	High	Low	Close	Volume	Market Cap
1	tezos	Dec 04, 2019	1.29	1.32	1.25	1.25	46,048,752	824,588,509
2	tezos	Dec 03, 2019	1.24	1.32	1.21	1.29	41,462,224	853,213,342
3	tezos	Dec 02, 2019	1.25	1.26	1.2	1.24	27,574,097	817,872,179
4	tezos	Dec 01, 2019	1.33	1.34	1.25	1.25	24,127,567	828,296,390
5	tezos	Nov 30, 2019	1.31	1.37	1.31	1.33	28,706,667	879,181,680
6	tezos	Nov 29, 2019	1.28	1.34	1.28	1.31	32,270,224	867,085,098
7	tezos	Nov 28, 2019	1.26	1.35	1.22	1.28	44,240,281	845,073,679
8	tezos	Nov 27, 2019	1.24	1.27	1.16	1.26	47,723,271	829,672,736
9	tezos	Nov 26, 2019	1.24	1.28	1.23	1.24	54,828,808	822,065,277
10	tezos	Nov 25, 2019	1.33	1.33	1.21	1.24	64,954,006	815,688,075
11	tezos	Nov 24, 2019	1.4	1.42	1.31	1.34	49,206,070	887,731,654
12	tezos	Nov 23, 2019	1.22	1.42	1.22	1.39	123,832,790	920,735,790
13	tezos	Nov 22, 2019	1.21	1.28	1.08	1.22	69,312,275	804,427,044
14	tezos	Nov 21, 2019	1.21	1.29	1.18	1.21	53,020,027	800,257,863
15	tezos	Nov 20, 2019	1.22	1.25	1.17	1.21	33,605,071	801,174,969
16	tezos	Nov 19, 2019	1.23	1.25	1.15	1.22	35,796,763	805,231,584
17	tezos	Nov 18, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
18	tezos	Nov 17, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
19	tezos	Nov 16, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
20	tezos	Nov 15, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
21	tezos	Nov 14, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
22	tezos	Nov 13, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
23	tezos	Nov 12, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
24	tezos	Nov 11, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
25	tezos	Nov 10, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
26	tezos	Nov 09, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
27	tezos	Nov 08, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
28	tezos	Nov 07, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
29	tezos	Nov 06, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
30	tezos	Nov 05, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
31	tezos	Nov 04, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
32	tezos	Nov 03, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
33	tezos	Nov 02, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
34	tezos	Nov 01, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
35	tezos	Oct 31, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
36	tezos	Oct 30, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
37	tezos	Oct 29, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
38	tezos	Oct 28, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
39	tezos	Oct 27, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
40	tezos	Oct 26, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
41	tezos	Oct 25, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
42	tezos	Oct 24, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
43	tezos	Oct 23, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
44	tezos	Oct 22, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
45	tezos	Oct 21, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
46	tezos	Oct 20, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
47	tezos	Oct 19, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
48	tezos	Oct 18, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
49	tezos	Oct 17, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
50	tezos	Oct 16, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
51	tezos	Oct 15, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
52	tezos	Oct 14, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
53	tezos	Oct 13, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
54	tezos	Oct 12, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
55	tezos	Oct 11, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
56	tezos	Oct 10, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
57	tezos	Oct 09, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
58	tezos	Oct 08, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
59	tezos	Oct 07, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
60	tezos	Oct 06, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
61	tezos	Oct 05, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
62	tezos	Oct 04, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
63	tezos	Oct 03, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
64	tezos	Oct 02, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
65	tezos	Oct 01, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
66	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
67	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
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84	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
85	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
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102	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
103	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
104	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
105	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
106	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
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117	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
118	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
119	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
120	tezos	Oct 00, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
121	tezos	Oct						

10	bnb	Dec 04, 2019	15.35	15.69	15.01	15.28	237,605,471	2,376,597,490
11	bnb	Dec 03, 2019	15.19	15.55	15.05	15.31	219,927,266	2,381,198,047
12	bnb	Dec 02, 2019	15.51	15.71	15.15	15.19	200,809,249	2,362,891,697
13	bnb	Dec 01, 2019	15.74	15.74	15.05	15.5	203,268,417	2,410,249,227
14	bnb	Nov 30, 2019	16.26	16.37	15.54	15.72	213,428,131	2,444,407,390
15	bnb	Nov 29, 2019	15.68	16.34	15.65	16.27	250,074,235	2,531,096,195
16	bnb	Nov 28, 2019	16.1	16.23	15.65	15.68	194,516,396	2,439,314,462
17	bnb	Nov 27, 2019	15.49	16.2	14.94	16.1	255,021,618	2,503,874,750
18	bnb	Nov 26, 2019	15.27	15.86	15.23	15.53	205,893,351	2,415,058,208
19	bnb	Nov 25, 2019	15.29	15.74	14.2	15.27	242,510,343	2,374,635,550
20	bnb	Nov 24, 2019	16.4	16.49	15.28	15.28	232,363,837	2,376,408,889
21	bnb	Nov 23, 2019	15.58	16.47	15.15	16.42	255,961,052	2,553,835,169
22	bnb	Nov 22, 2019	16.84	17.27	14.69	15.58	341,456,274	2,423,526,845
23	bnb	Nov 21, 2019	18.16	18.19	16.62	16.84	228,429,806	2,619,271,948
24	bnb	Nov 20, 2019	18.71	18.93	17.85	18.17	210,091,849	2,826,455,734
25	bnb	Nov 19, 2019	19.31	19.63	18.38	18.7	206,923,366	2,909,049,614
26	bnb	Nov 18, 2019	20.34	20.43	18.94	19.32	224,380,017	3,004,482,390
27	bnb	Nov 17, 2019	20.28	20.62	20.03	20.26	224,982,244	3,151,297,091

The full data list is here:

https://drive.google.com/file/d/1ZXLrgc_4uNoo91ObCeCbsm5wxZv50FNZ/view?usp=sharing

You need to read the data and order the crypto by its market cap in descending mode and display relevant attributes including **Price**, **24h change difference**, **7d change difference** and **1month change difference**, **24h Volume** and **Market Cap**, which is similar to CoinGecko. Here is an example from CoinGecko. (We don't need to have 1h change difference since we are lacking data)

#	Coin	Price	1h	24h	7d	24h Volume	Mkt Cap
☆ 1	 Bitcoin BTC	\$11,466.29	-0.1%	0.7%	6.4%	\$21,693,741,619	\$212,304,036,949
☆ 2	 Ethereum ETH	\$384.59	0.3%	2.8%	8.8%	\$13,116,240,253	\$43,402,191,897
☆ 3	 Tether USDT	\$0.998338	-0.1%	-0.1%	-0.2%	\$33,725,790,482	\$15,721,296,862
☆ 4	 XRP XRP	\$0.255114	-0.0%	0.1%	2.0%	\$1,662,716,206	\$11,512,180,722
☆ 5	 Binance Coin BNB	\$31.35	1.6%	8.0%	9.6%	\$528,811,532	\$4,628,405,000

Preferred Technologies to be used:

The position for which this challenge is being presented has a mix of these tech stack:

ReactJS, NodeJS, TypeScript/ES6, MongoDB, postgres, NestJS, TypeORM, Java, AWS etc.

Development Notes:

The goal of this coding challenge is to provide the candidate an opportunity to showcase their expertise in following areas:

- Ability to setup the data in Relational Database or Nosql Database
- Ability to retrieve data from a database or by calling an API.
- Ability to process the data or build efficient computational logic using a library/framework best suited for the task OR just using the inherent language features.
- Ability to display the processed data in the required format using a suitable frontend library/framework.

Depending on your expertise and experience in certain areas you can choose to put more effort there. For example, if you are more comfortable in backend/database/API side, you can choose to simplify the presentation logic in favor of an elaborate backend design.

- You can come up with your own UX for displaying the output, while ensuring the key details are not missed out. Recommended output would be a web page using React components, but you can choose another framework as well.
- Feel free to make assumptions if something is not clear and specify those assumptions in code comments.
- For the backend part, you can read the data from a database OR a JSON file OR even build an API. Use the following details as suggestions, but not requirements:
 - If you are working with Relational Database, you can assume it to have similar schema as in the previous csv data example.
 - If you are working with API, NoSQL DB or JSON file, the JSON need to be represented clearly and concisely.
- Ensure the prevalent best coding practices are followed and write clean code.
- Demonstrate TDD approach was taken during the development.
- Commit the solution to Github and share the URL. Make sure the project is not private in git and is accessible to reviewers.
- If you are successful in obtaining a 1st round interview, please come prepared to discuss your solution/implementation as this will form a part of the interview process.

Stretch Objectives:

If the challenge is simple enough for you, you are encouraged to optionally implement additional features or elaborate on your solution. Few suggestions are:

- Implement/enhance the API that retrieves filtered data based on the parameters passed while calling the API. such as latest filtered by the latest 7 days, 24 hours and 1 months. Ordering from highest to lowest by market cap, coin price etc.
- Assume you need to keep updating the original database to have the latest data, come up with a caching strategy to fit into the solution. There is no code needed to implement, but a well documented high level solution design diagram will be highly useful
- Incorporating AWS skills in the solution and using docker to containerize the whole solution will be highly favored

Good Luck
UTU Team