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
2	tezos	Dec 04, 2019	1.29	1.32	1.25	1.25	46,048,752	824,588,509
3	tezos	Dec 03, 2019	1.24	1.32	1.21	1.29	41,462,224	853,213,342
4	tezos	Dec 02, 2019	1.25	1.26	1.2	1.24	27,574,097	817,872,179
5	tezos	Dec 01, 2019	1.33	1.34	1.25	1.25	24,127,567	828,296,390
6	tezos	Nov 30, 2019	1.31	1.37	1.31	1.33	28,706,667	879,181,680
7	tezos	Nov 29, 2019	1.28	1.34	1.28	1.31	32,270,224	867,085,098
8	tezos	Nov 28, 2019	1.26	1.35	1.22	1.28	44,240,281	845,073,679
9	tezos	Nov 27, 2019	1.24	1.27	1.16	1.26	47,723,271	829,672,736
10	tezos	Nov 26, 2019	1.24	1.28	1.23	1.24	54,828,808	822,065,277
11	tezos	Nov 25, 2019	1.33	1.33	1.21	1.24	64,954,006	815,688,075
12	tezos	Nov 24, 2019	1.4	1.42	1.31	1.34	49,206,070	887,731,654
13	tezos	Nov 23, 2019	1.22	1.42	1.22	1.39	123,832,790	920,735,790
14	tezos	Nov 22, 2019	1.21	1.28	1.08	1.22	69,312,275	804,427,044
15	tezos	Nov 21, 2019	1.21	1.29	1.18	1.21	53,020,027	800,257,863
16	tezos	Nov 20, 2019	1.22	1.25	1.17	1.21	33,605,071	801,174,969
17	tezos	Nov 19, 2019	1.23	1.25	1.15	1.22	35,796,763	805,231,584
18	tezos	Nov 18, 2019	1.16	1.26	1.16	1.23	37,602,915	813,744,878
13	eos	Dec 04, 2019	2.7	2.74	2.6	2.65	1,991,656,646	2,497,719,668
14	eos	Dec 03, 2019	2.69	2.74	2.65	2.7	1,391,933,885	2,549,066,942
15	eos	Dec 02, 2019	2.78	2.8	2.66	2.69	1,641,895,350	2,531,453,856
16	eos	Dec 01, 2019	2.76	2.84	2.68	2.78	1,792,147,034	2,618,290,742
17	eos	Nov 30, 2019	2.8	2.83	2.74	2.76	1,537,950,803	2,598,670,742
18	eos	Nov 29, 2019	2.64	2.8	2.64	2.8	1,899,935,358	2,636,173,142
19	eos	Nov 28, 2019	2.69	2.76	2.62	2.64	1,514,999,632	2,483,560,320
20	eos	Nov 27, 2019	2.63	2.73	2.53	2.69	2,247,567,344	2,532,133,843
21	eos	Nov 26, 2019	2.53	2.65	2.53	2.63	1,894,353,525	2,479,535,254
22	eos	Nov 25, 2019	2.45	2.6	2.37	2.54	3,240,749,705	2,387,930,189
23	eos	Nov 24, 2019	2.72	2.73	2.45	2.45	2,906,089,979	2,307,205,605
24	eos	Nov 23, 2019	2.63	2.73	2.59	2.72	2,021,876,981	2,564,872,526
25	eos	Nov 22, 2019	2.83	2.85	2.51	2.63	3,602,118,620	2,477,842,442
26	eos	Nov 21, 2019	3.1	3.12	2.79	2.83	2,542,236,471	2,659,185,420
27	eos	Nov 20, 2019	3.15	3.18	3.09	3.1	1,963,218,325	2,914,257,086
49	bitcoin	Dec 04, 2019	7,320.13	7,539.78	7,170.92	7,252.03	21,664,240,918	131,143,073,943
50	bitcoin	Dec 03, 2019	7,323.98	7,418.86	7,229.36	7,320.15	14,797,485,769	132,359,942,301
51	bitcoin	Dec 02, 2019	7,424.04	7,474.82	7,233.40	7,321.99	17,082,040,706	132,378,982,377
52	bitcoin	Dec 01, 2019	7,571.62	7,571.62	7,291.34	7,424.29	18,720,708,479	134,215,145,410
53	bitcoin	Nov 30, 2019	7,764.06	7,836.10	7,515.85	7,569.63	17,158,194,786	136,829,391,049
54	bitcoin	Nov 29, 2019	7,466.73	7,781.18	7,460.76	7,761.24	19,709,695,456	140,280,108,521
55	bitcoin	Nov 28, 2019	7,536.82	7,730.07	7,454.12	7,463.11	19,050,116,751	134,879,411,013
56	bitcoin	Nov 27, 2019	7,220.88	7,619.69	6,974.17	7,531.66	23,991,412,764	136,102,712,894
57	bitcoin	Nov 26, 2019	7,145.16	7,320.23	7,098.57	7,218.37	21,129,505,542	130,429,018,720
58	bitcoin	Nov 25, 2019	7,039.98	7,319.86	6,617.17	7,146.13	42,685,231,262	129,112,952,930
59	bitcoin	Nov 24, 2019	7,398.63	7,408.58	7,029.29	7,047.92	30,433,517,289	127,327,398,565
60	bitcoin	Nov 23, 2019	7,296.16	7,442.26	7,151.42	7,397.80	21,008,924,418	133,636,205,957
61	bitcoin	Nov 22, 2019	7,643.57	7,697.38	6,936.71	7,296.58	34,242,315,785	131,791,783,672
62	bitcoin	Nov 21, 2019	8,023.64	8,110.10	7,597.38	7,642.75	22,514,243,371	138,031,885,379
63	bitcoin	Nov 20, 2019	8,203.61	8,237.24	8,010.51	8,027.27	20,764,300,437	144,962,727,398
64	bitcoin	Nov 19, 2019	8,305.13	8,408.52	8,099.96	8,206.15	21,083,613,816	148,178,376,843
65	bitcoin	Nov 18, 2019	8,573.98	8,653.28	8,273.57	8,309.29	21,579,470,673	150,025,712,267
66	bitcoin	Nov 17, 2019	8,549.47	8,727.79	8,500.97	8,577.98	18,668,638,897	154,861,842,425
67	bitcoin	Nov 16, 2019	8,491.17	8,592.00	8,473.97	8,550.76	16,495,389,808	154,354,054,194
68	bitcoin	Nov 15, 2019	8,705.71	8,730.87	8,484.84	8,491.99	21,796,856,471	153,277,483,626

00	bnb	Dec 04, 2019	15.35	15.69	15.01	15.28	237,605,471	2,376,597,490
01	bnb	Dec 03, 2019	15.19	15.55	15.05	15.31	219,927,266	2,381,198,047
02	bnb	Dec 02, 2019	15.51	15.71	15.15	15.19	200,809,249	2,362,891,697
03	bnb	Dec 01, 2019	15.74	15.74	15.05	15.5	203,268,417	2,410,249,227
04	bnb	Nov 30, 2019	16.26	16.37	15.54	15.72	213,428,131	2,444,407,390
05	bnb	Nov 29, 2019	15.68	16.34	15.65	16.27	250,074,235	2,531,096,195
06	bnb	Nov 28, 2019	16.1	16.23	15.65	15.68	194,516,396	2,439,314,462
07	bnb	Nov 27, 2019	15.49	16.2	14.94	16.1	255,021,618	2,503,874,750
08	bnb	Nov 26, 2019	15.27	15.86	15.23	15.53	205,893,351	2,415,058,208
09	bnb	Nov 25, 2019	15.29	15.74	14.2	15.27	242,510,343	2,374,635,550
00	bnb	Nov 24, 2019	16.4	16.49	15.28	15.28	232,363,837	2,376,408,889
01	bnb	Nov 23, 2019	15.58	16.47	15.15	16.42	255,961,052	2,553,835,169
02	bnb	Nov 22, 2019	16.84	17.27	14.69	15.58	341,456,274	2,423,526,845
03	bnb	Nov 21, 2019	18.16	18.19	16.62	16.84	228,429,806	2,619,271,948
04	bnb	Nov 20, 2019	18.71	18.93	17.85	18.17	210,091,849	2,826,455,734
05	bnb	Nov 19, 2019	19.31	19.63	18.38	18.7	206,923,366	2,909,049,614
06	bnb	Nov 18, 2019	20.34	20.43	18.94	19.32	224,380,017	3,004,482,390
07	bnb	Nov 17, 2019	20.28	20.62	20.03	20.26	224,982,344	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