Temasek Assignment

What we are looking for

- Programming language best practices
- Show us your work via your commit history
- Code must be working and organised in an appropriate manner
- Correctness: Does the code work as required? Are edge-cases tested?
- Maintainability: Is the code easy to understand? Is the code easy to extend?

Task #1: The numbers, Mason

- Choose a language of your choice
- Implement a currency exchange API (Fiat & Crypto)
    - `GET /exchange-rates`
    - Takes in the following query param:
        - `base: "fiat" | "crypto"`
- Expected Response:

```
GET /rates?base=crypto

{
   "BTC": {
     "USD": "29717.50",
     "SGD": "40873.42",
     "EUR": "27519.47"
   },
   "DOGE": {
     "USD": "0.084",
     "SGD": "0.12",
     "EUR": "0.075"
   },
   "ETH": {
     "USD": "2022.43",
     "SGD": "2853.29",
     "EUR": "1945.12"
   }



GET /rates?base=fiat
```

```
{
   "USD": {
     "BTC": "0.000032",
     "DOGE": "11.42",
     "ETH": "0.00049"
   },
   "SGD": {
     "BTC": "0.000023",
     "DOGE": "8.72",
     "ETH": "0.00034"
   },
   "EUR": {
     "BTC": "0.000034",
     "DOGE": "12.84",
     "ETH": "0.00052193"
   }
}
```

- We are only interested in the 3 Fiat Currencies (USD, SGD, EUR) and the 3 Crypto Currencies (BTC, DOGE, ETH)
- We recommend using the free Coinbase API to get the information required - https://docs.cloud.coinbase.com/sign-in-with-coinbase/docs/api-exchange-rates#get-exchange-rates

Task #2: Persistence is Key

- Create a persistent store for the currency exchange data and connect it to your backend
- Implement a mechanism where your service will regularly update the persistent store with the latest currency exchange data
- Your API in Task #1 should be refactored to serve currency exchange data from the persistent store instead of the external API.
- The schema is flexible, but should make sense. You might also want to look at Task #3 before designing the schema.

Task #3: Viz Whizz

- To serve data to a visualization tool, we now need to create a new API.

- We want to show how currency pairs vary in relation to each other over time.

  Please create the following API to accept the following parameters and return the response as shown below:

  ```
  GET /historical-rates?
  base_currency=USD&target_currency=ETH&start=1672508225000
  &end=1675013825000
  ```

  Query Parameters

  base_currency - The reference base currency. 1 unit of this currency should be compared against the target_currency below.

  target_currency - The target currency. The API should return the amount of target_currency 1 unit of base_currency can be exchanged for

  start - The starting Unix timestamp in UTC, in milliseconds.

  end - (Optional) The ending Unix timestamp in UTC (in milliseconds). If undefined, it assumes the current time.

  Sample Response (JSON)

```
"results": [
    {
      "timestamp": 1672508225000,
      "value": "0.00049"
    },
    {
      "timestamp": 1672508325000,
      "value": "0.00052"
    },
    {
      "timestamp": 1672508425000,
      "value": "0.00050"
    },
    // ... more results
  ]
}
```