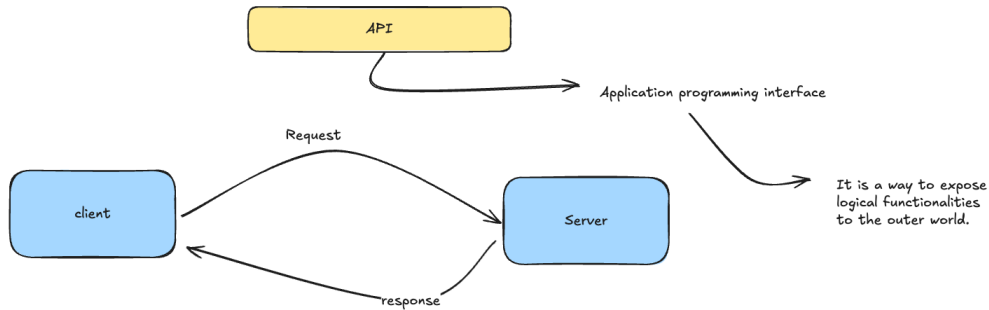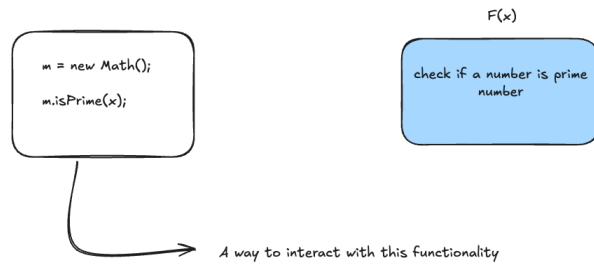- 1. in order to interact with a system, we need to follow the principles and rules created by the system

- 2. internal details of a system can be hidden because most of the time we just need to know how to interact with the system, instead of knowing the internals of it.

API

Application programming interface

Request

client

Server

response

It is a way to expose logical functionalities to the outer world.

- We as the backend engineers are going to expose the details of how any request is expected to be sent to the server. ----> contract

- We should make sure the details of the logics is abstracted (hidden) from the clients, they only need to know the way to interact with the system.

$F(x)$

m = new Math();

m.isPrime(x);

check if a number is prime number

A way to interact with this functionality

Network API --> there is some level of network interaction happening between the systems to interact with a functionality.

How to code an API ? (Network)

- SOAP Apis

REST -> gRPC -> GraphQL

- REST Apis (most common)

- rpcs -> grpc

myflipkart.com/findUserAndMakePayment

and many more....

REST APIs

- REST is a set of recommendations to create scalable and managable apis.

- any data transfer should be facilitated through JSON

key - value pair based storage

Java script object notation

.json

```
{
  "DocumentType": 1,
  "No.": "S-ORD101001",
  "SellToCustNo": "10000",
  "PostingDate": "2023-04-02",
  "Lines": [
    {
      "LineNo": 10000,
      "Type": 2,
      "No": "1996-S",
      "Quantity": 12,
      "UnitPrice": 1397.3
    },
    {
      "LineNo": 20000,
      "Type": 2,
      "No": "1900-S",
      "Quantity": 4,
      "UnitPrice": 192.8
    }
  ]
}
```

1. Easy to read

2. Lang independent

3. data is more structured and segregated

4. Interoperable with most lang dependent alternatives

5. Lighter than XML

- Network protocol to be used will be http -> hyper text transfer protocol or https

- REST expects us to expose URI (uniform resource identifier)s

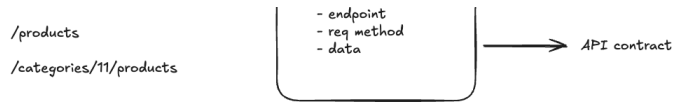Ex: https://myflipkart.com/users/22/order

endpoint

myflipkart.com/index.html

google.com

- recommendations for how this endpoint looks like:

a. The endpoint should be resource oriented.
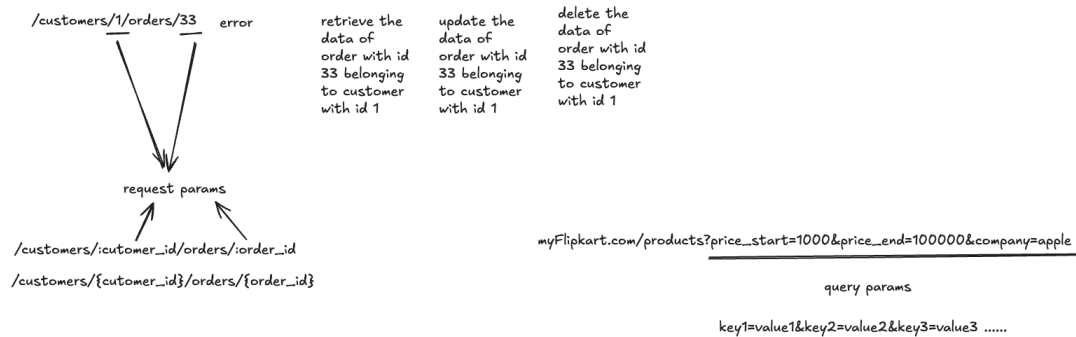
/users/22/orders

/products

/categories/11/products

- endpoint
- req method
- data

→ API contract

HTTP -> Hyper text transfer protocol

HTML -> Hyper text markup lang

endpoint
req body
req header
req method

GET
POST
PUT
PATCH
DELETE
HEAD
.....
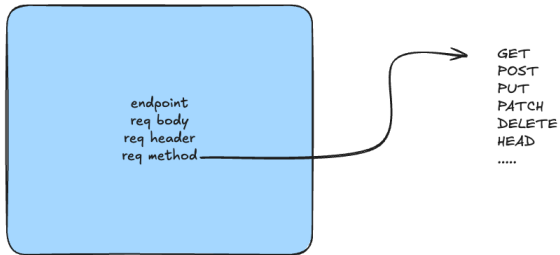
/users
GET → Get the details of all the users

/users/101
GET → Get the details of user with id 101

Resource	POST	GET	PUT	DELETE
/customers	Create a new customer	Retrieve all customers	Bulk update of customers	Remove all customers
/customers/1	Error	Retrieve the details for customer 1	Update the details of customer 1 if it exists	Remove customer 1
/customers/1/orders	Create a new order for customer 1	Retrieve all orders for customer 1	Bulk update of orders for customer 1	Remove all orders for customer 1

/customers/1/orders/33   error   retrieve the data of order with id 33 belonging to customer with id 1   update the data of order with id 33 belonging to customer with id 1   delete the data of order with id 33 belonging to customer with id 1

request params

/customers/:cutomer_id/orders/:order_id

/customers/{cutomer_id}/orders/{order_id}

myFlipkart.com/products?price_start=1000&price_end=100000&company=apple

query params

key1=value1&key2=value2&key3=value3 ......

ways to send data

1. Req body

2. request params →

3. query params

```
11  https://www.flipkart.com/audio-video/headphones/pr?
12  sid=0pm,fcn&otracker=categorytree&p[]=facets.connectivity%5B%5D=Wired&
13  fm=neo/merchandising&iid=M_a6bbfb41-1664-4676-b1a8-9327421ab004_1_372UD5BXDFYS_MC.LSKPCXUOS6SB&
14  otracker=hp_rich_navigation_3_1.navigationCard.RICH_NAVIGATION_Electronics~Audio~Wired+Headphones_LSKPCXUOS6SB&
15  otracker1=hp_rich_navigation_PINNED_neo/merchandising_NA_NAV_EXPANDABLE_navigationCard_cc_3_L2_view-all&
16  cid=LSKPCXUOS6SB&p[]=facets.rating%5B%5D=4%E2%98%85+%26+above&
17  p[]=facets.price_range.from=1500&
18  p[]=facets.price_range.to=2600&p[]=facets.brand%5B%5D=SONY&p[]=facets.brand%5B%5D=JBL
```