Path and Query Params in FastAPI

1) Path Params:

Path parameters are dynamic segments of a URL path used to identify a specific resource.

localhost:800/view ⟶ for all the patients

localhost:800/view/3 ⟶ specific for third patient

are call it path params

- it helps to retrieve specific person
- update a single portion.
- delete the specific feature or status

The path() function in FastAPI is used to provide metadata, validation rules and documentation hints for path parameters in your API end points. example that we do using path() is Title, Description, Example, ge, gt, le, lt, Min-length, Max_length, regex
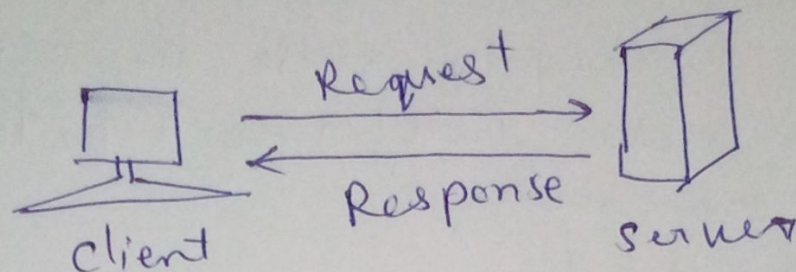
purpose.

- validation:- path() allow us to define constraints on path parameter values such as minimum/maximum length, regular expression or specific numeric ranges (e.g. "ge" for greater than or equal, "le" for less than or equal)

- Metadata: We can add description metadata to path parameters, including a "title", "description" and "example" value which will be included in the automatically generated openAPI documentation (Swagger UI).

HTTP status codes

it is a 3-digit numbers returned by a web server. (like FasAPI) to indicate the result of client's request (like from a browser or API consumer).

Request →
← Response

client   server

- They help the client (browser, frontend, mobile app etc) understand
  - whether the request was successful
  - whether something went wrong
  - and what kind of issue occured (if any)

Types of status codes:

(i) 2xx	success	The request was successfully received and processed
(ii) 3xx	Redirection	Further action needs to be taken (e.g. redirect)
(iii) 4xx	client error	Something is wrong with the request from the client
(iv) 5xx	Server error	something went wrong on the server side

Some status code

200 ok	Standard success	A GET or POST succeeded
201 Created	Resource created	After a POST the creates something
204 No Content	Success But no data return.	After a DELETE request

404 Bad Request	Malformed or invalid request	Missing field, wrong data type
401 Unauthorized	No/invalid authentication.	Login required
403 Forbiden	Authenticated, but no permission	Logged in but not allowed
404 Not Found	Resource doesn't exist	Patient ID not in DB

500 (internal Server error)	Generic failure	Something broke on the server
502 Bad Gateway	Gateway (like Nginx) faild to reach backend
503 Service Unavailable	Server is down or overloaded

HTTPException:

It is special build-in exception in FastAPI used to return. custom HTTP error responses when something goes wrong in your API.

instead of returning a normal JSON or crashing the server, you can gracefully raise an error with.

- a proper HTTP status code (like 404, 400, 403 etc)
- a custom error message
- (optional) extra headers.

② Query Params:

Query parameters are optional key-value pairs appended to the end of a URL. used to pass additional data to the server in an HTTP request. They are typically employed for operations like filtering, sorting, searching and pagination, without altering the endpoint path itself.

/patients? city = Delhi & sort-by = age

- The ? marks the start of query parameters
- Each parameter is a key-value pair: key = value
- Multiple parameters are separated by &

in this case
- city = Delhi is a query parameter for filtering
- sort-by = age is a query parameter for sorting

Query() is a utility function provided by FastAPI to declare, validate, and document query parameters in your API endpoints.

it allows you to
- set default values
- enforce validation rules
- Add metadata like description, title, examples

default	Set default value (e.g., Query(0))
title	Displayed in API docs
description	Detailed explanation in Swagger
example/examples	provide sample inputs
min-length, max-length	validate string length
ge, gt, le, lt	validate numeric bounds
regex	pattern match for strings