

README: Question 5 Clinical Data RESTful API using FASTAPI

```
## Q5 — Clinical Trial Data API (FastAPI)
```

****Purpose:**** REST API to query adverse-event data: filter by severity and/or treatment arm, and get subject-level risk scores.

Contents

Path	Description
`main.py`	FastAPI app: `GET /`, `POST /ae-query`, `GET /subject-risk/{subject_id}`
`requirements.txt`	fastapi, uvicorn, pandas, pydantic
`data/adae.csv`	Input AE dataset (expected columns include USUBJID, AESEV; ACTARM optional)

How to run

```
```bash
cd Q5
pip install -r requirements.txt
uvicorn main:app --reload
````
```

- API: <<http://127.0.0.1:8000>>
- Docs: <<http://127.0.0.1:8000/docs>>

Endpoints

- ****GET **** — Health check.
- ****POST /ae-query**** — Body: `{ "severity": ["SEVERE"], "treatment_arm": "Placebo" }` (optional). Returns matching record count, unique subject count, and subject list.
- ****GET /subject-risk/{subject_id}**** — Returns risk score and category (Low/Medium/High) for a subject.

Execute in the Q5 folder the following:

```
> pip install -r requirements.txt
```

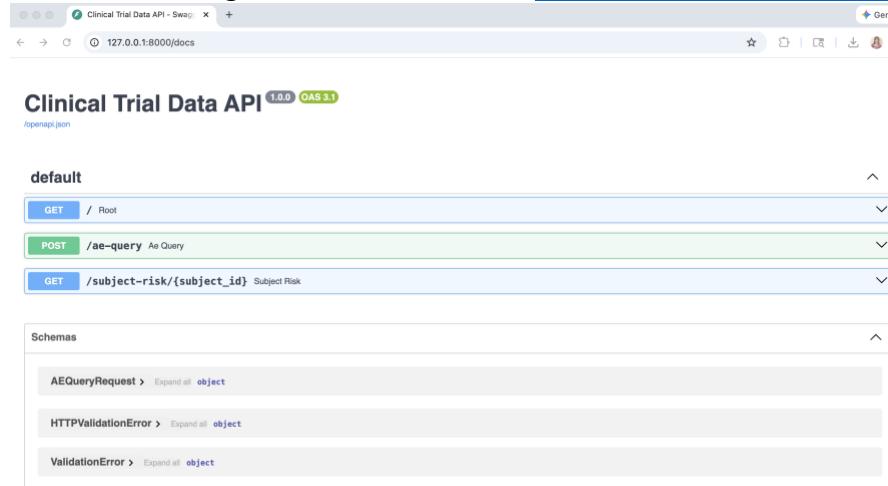
```
> uvicorn main:app --reload --port 8000
```

Follow link to <http://127.0.0.1:8000>



```
{"message": "Clinical Trial Data API is running"}
```

On browser navigate to docs folder, url: <http://127.0.0.1:8000/docs>



- 1) Expand the **POST/ae-query arrow** dropdown -> click try it out button -> edit the severity string and execute to get subjects of that severity. **Treatment arm is optional** and this filter will be applied **only if ACTARM column is present** in the ae dataset. This dataset has no ACTARM, and the ae-query with and without the treatment arm specified gives the same result as this filter is not applied.

```
POST/ ae-query : {  
  "severity": [  
    "SEVERE", "MODERATE"  
  ]  
}
```

The screenshot shows two side-by-side browser tabs. Both tabs have the URL `127.0.0.1:8000/docs#/default/ae_query_ae_query_post`.

No Treatment arm:

- Curl:**

```
curl -X 'POST' \
  'http://127.0.0.1:8000/ae-query' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
  -d '{
    "severity": [
      "severe", "moderate"
    ]
}'
```
- Request URL:** `http://127.0.0.1:8000/ae-query`
- Server response:**

| Code | Details |
|------|---------------|
| 200 | Response body |
- Response body:**

```
{ "matching_record_count": 421, "unique_subject_count": 148, "subjects": [ "01-701-1023", "01-701-1047", "01-701-1097", "01-701-1111", "01-701-1115", "01-701-1133", "01-701-1146", "01-701-1148", "01-701-1180", "01-701-1181", "01-701-1188", "01-701-1192", "01-701-1211", "01-701-1239", "01-701-1294" ] }
```

Treatment arm specified:

- Curl:**

```
curl -X 'POST' \
  'http://127.0.0.1:8000/ae-query' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
  -d '{
    "severity": [
      "severe", "moderate"
    ],
    "treatment_arm": "placebo"
}'
```
- Request URL:** `http://127.0.0.1:8000/ae-query`
- Server response:**

| Code | Details |
|------|---------------|
| 200 | Response body |
- Response body:**

```
{ "matching_record_count": 421, "unique_subject_count": 148, "subjects": [ "01-701-1023", "01-701-1047", "01-701-1097", "01-701-1111", "01-701-1115", "01-701-1133", "01-701-1146", "01-701-1148", "01-701-1180", "01-701-1181", "01-701-1188", "01-701-1192", "01-701-1211", "01-701-1239", "01-701-1294" ] }
```

Same output as no ACTARM in this dataset. Filter not applied.

- 2) Expand the **GET/subject-risk/{subject_id}** arrow dropdown -> click try it out button -> enter subject id and execute to get risk score.

GET: /subject-risk/{subject_id}

Risk score of subject 01-701-1097

GET /subject-risk/{subject_id} Subject Risk

Parameters

Name Description

subject_id * required
string
(path)
01-701-1097

Execute Clear

Responses

Curl

```
curl -X 'GET' \
'http://127.0.0.1:8000/subject-risk/01-701-1097' \
-H 'accept: application/json'
```

Request URL

```
http://127.0.0.1:8000/subject-risk/01-701-1097
```

Server response

Code Details

200 Response body

```
{ "subject_id": "01-701-1097", "risk_score": 20, "risk_category": "High" }
```

Download

404 HTTP exception for subject that does not exist:

Curl

```
curl -X 'GET' \
'http://127.0.0.1:8000/subject-risk/01-70189-121100' \
-H 'accept: application/json'
```

Request URL

```
http://127.0.0.1:8000/subject-risk/01-70189-121100
```

Server response

Code Details

404 Error: Not Found

Undocumented

Response body

```
{  
    "detail": "Subject not found."  
}
```

Response headers

```
content-length: 31  
content-type: application/json  
date: Sun, 15 Feb 2026 03:36:10 GMT  
server: uvicorn
```

Terminal log:

```
(base) ambika@ambikas-mbp Q5 % uvicorn main:app --reload  
INFO:     Will watch for changes in these directories: ['/Users/ambika/Documents/Career  
ws/Genentech/DNA_CodeChallenge/Q5']  
INFO:     Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)  
INFO:     Started reloader process [14027] using StatReload  
INFO:     Started server process [14029]  
INFO:     Waiting for application startup.  
INFO:     Application startup complete.  
INFO:     127.0.0.1:51405 - "GET / HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51413 - "GET /docs HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51413 - "GET /openapi.json HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51428 - "POST /ae-query HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51532 - "POST /ae-query HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51553 - "GET /subject-risk/01-701-1211 HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51561 - "GET /subject-risk/01-701-1211 HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51577 - "POST /ae-query HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51606 - "POST /ae-query HTTP/1.1" 200 OK  
INFO:     127.0.0.1:51610 - "GET /subject-risk/01-701-12110 HTTP/1.1" 404 Not Found  
INFO:     127.0.0.1:51618 - "GET /subject-risk/01-70189-121100 HTTP/1.1" 404 Not Found  
INFO:     127.0.0.1:51647 - "GET /subject-risk/01-70189-121100 HTTP/1.1" 404 Not Found
```

```
(base) ambika@ambikas-mbp ~ % curl -X 'POST' \
'http://127.0.0.1:8000/ae-query' \
-H 'accept: application/json' \
-H 'Content-Type: application/json' \
-d '{
  "severity": [
    "severe"
  ],
  "treatment_arm": "placebo"
}'
{"matching_record_count":43,"unique_subject_count":31,"subjects":["01-701-1211","01-703-1086","01-703-1119","01-703-1175","01-704-1008","01-704-1135","01-704-1445","01-705-1393","01-706-1049","01-708-1019","01-708-1178","01-708-1272","01-708-1428","01-709-1007","01-709-1259","01-710-1070","01-710-1077","01-710-1083","01-710-1154","01-710-1271","01-710-1368","01-711-1143","01-714-1195","01-716-1103","01-716-1189","01-717-1174","01-718-1066","01-718-1079","01-718-1170","01-718-1371","01-718-1427"]}%
(base) ambika@ambikas-mbp ~ %
```

```
(base) ambika@ambikas-mbp ~ % curl -X 'GET' \
'http://127.0.0.1:8000/subject-risk/01-701-1211' \
-H 'accept: application/json'
>{"subject_id":"01-701-1211","risk_score":19,"risk_category":"High"}%
(base) ambika@ambikas-mbp ~ %
```

```
(base) ambika@ambikas-mbp ~ % curl -X 'GET' \
'http://127.0.0.1:8000/subject-risk/01-70189-121100' \
-H 'accept: application/json'
>{"detail":"Subject not found."}%
(base) ambika@ambikas-mbp ~ %
```