

## 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.

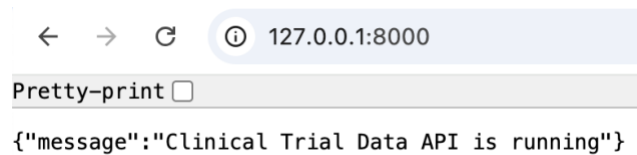
---
```

Execute in the Q5 folder the following:

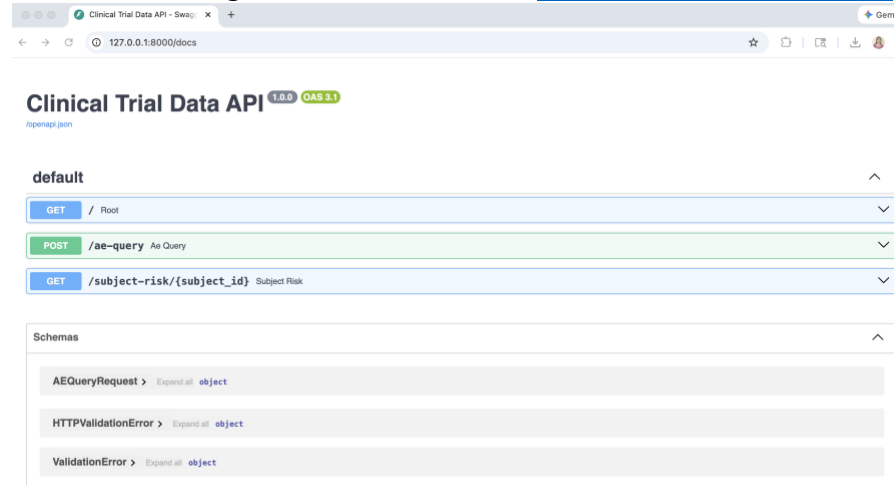
```
> pip install -r requirements.txt
```

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

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



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"  
  ]  
}
```

| No Treatment arm   | Treatment arm specified   |
|--|---|
| <p>127.0.0.1:8000/docs#/default/ae_query_ae_query_post</p> <p>Curl</p> <pre>curl -X 'POST' \ 'http://127.0.0.1:8000/ae-query' \ -H 'accept: application/json' \ -H 'Content-Type: application/json' \ -d '{   "severity": [     "severe", "moderate"   ] }'</pre> <p>Request URL</p> <p>http://127.0.0.1:8000/ae-query</p> <p>Server response</p> <p>Code Details</p> <p>200</p> <p>Response body</p> <pre>{   "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"   ] }</pre> | <p>127.0.0.1:8000/docs#/default/ae_query_ae_query_post</p> <p>Curl</p> <pre>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" }'</pre> <p>Request URL</p> <p>http://127.0.0.1:8000/ae-query</p> <p>Server response</p> <p>Code Details</p> <p>200</p> <p>Response body</p> <pre>{   "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"   ] }</pre> |

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

- 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

127.0.0.1:8000/docs#/default/subject\_risk\_subject\_risk\_\_subject\_id\_\_get

GET /subject-risk/{subject\_id} Subject Risk

Parameters

Cancel

| Name   | Description |
|--|-------------|
| subject_id <span style="color: red;">*</span> 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   |                  |
|--|------------------|
| <pre>curl -X 'GET' \ 'http://127.0.0.1:8000/subject-risk/01-70189-121100' \ -H 'accept: application/json'</pre>  |                  |
| Request URL  |                  |
| <pre>http://127.0.0.1:8000/subject-risk/01-70189-121100</pre>  |                  |
| Server response  |                  |
| Code   | Details          |
| 404<br><i>Undocumented</i>   | Error: Not Found |
| Response body  |                  |
| <pre>{   "detail": "Subject not found." }</pre>  |                  |
| Response headers   |                  |
| <pre>content-length: 31 content-type: application/json date: Sun, 15 Feb 2026 03:36:10 GMT server: uvicorn</pre> |                  |

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 ~ %
```