Advertima Backend Engineer task

Advertima operates a number of devices with connected sensors and screens. Each device plays contents to its audience.
The sensors scan the environment in front of the screen and constantly report which persons are detected (available to you in persons.csv). In addition, the devices report which contents were played by reporting start and end events per content (available to you in events.csv).

Data examples

Reported events

For each event we know the content (by ID), the device that reported this event (by ID), the type of the event (either start or end), and the time when this event was reported.

events.csv

```
content ID, device ID, event type, event time (timestamp)
...
63, 2, start, 2016-01-16 14:39:41
87, 1, start, 2016-01-16 14:39:47
63, 2, end, 2016-01-16 14:40:05
7, 2, start, 2016-01-16 14:40:05
87, 1, end, 2016-01-16 14:40:15
7, 2, end, 2016-01-16 14:40:41
...
```

For example the content with the ID 87 was played from 2016-01-16 14:39:47 to 2016-01-16 14:40:15.

Reported persons

For each detected person we know the device (by ID) that reported this person, the time when the person appeared in front of the device, the time when the person disappeared again, and the age and gender of that person.

persons.csv

```
device ID, appears (timestamp), disappears (timestamp), age, gender
...
2, 2016-01-14 13:31:09, 2016-01-14 13:32:46, 25, female
2, 2016-01-14 13:32:15, 2016-01-14 13:32:46, 25, male
1, 2016-01-14 13:31:03, 2016-01-14 13:32:49, 72, female
1, 2016-01-14 13:30:56, 2016-01-14 13:32:50, 75, male
3, 2016-01-14 13:32:05, 2016-01-14 13:32:51, 46, male
...
```

Task

Your task is to develop a simple web server with REST API, which provides the following 3 endpoints:

Number of viewers

Explanation: Returns the number of viewers of a given device and content in a given time period.

```
Request example: http://<server>/viewer-
count/?start=<start_timestamp>&end=<end_timestamp>&device=<device_id>
&content=<content_id>

Response example (JSON): {"start": 2016-02-13 12:45:32, "end": 2016-
03-01 11:23:52, "device_id": 5, "content_id": 7, "views": 5423}
```

Average age of viewers

Explanation: Returns the average age of viewers of a given device and content in a given time period.

```
Request example: http://<server>/avg-
age/?start=<start_timestamp>&end=<end_timestamp>&device=<device_id>&c
ontent=<content_id>

Response example (JSON): {"start": 2016-02-13 12:45:32, "end": 2016-
03-01 11:23:52, "device_id": 5, "content_id": 7, "avg_age": 34.2}
```

Gender distribution

Explanation: Returns the gender distribution of the viewers of a given device and content in a given time period.

```
Request example: http://<server>/gender-
dist/?start=<start_timestamp>&end=<end_timestamp>&device=<device_id>&
content=<content_id>

Response example (JSON): {"start": 2016-02-13 12:45:32, "end": 2016-
03-01 11:23:52, "device_id": 5, "content_id": 7, "gender-dist":
{"male": 0.44, "female": 0.56}}
```

You are free to use whatever technologies you like including any language or framework and other tools that may help you (including libraries, databases, etc). You may transform the data in any way you see fit and change how it is stored or retrieved.

Make sure that we are able to execute your solution easily without very specific dependencies (especially if you use another language than python and a different operating system than Mac OS. A containerized environment might be useful in such a case).

Please send your solution within 7 days to andreas.schilling@advertima.com

Good luck and have fun!