SOFT8026 - Data-driven Microservices
Assignment 1 Form R00090111
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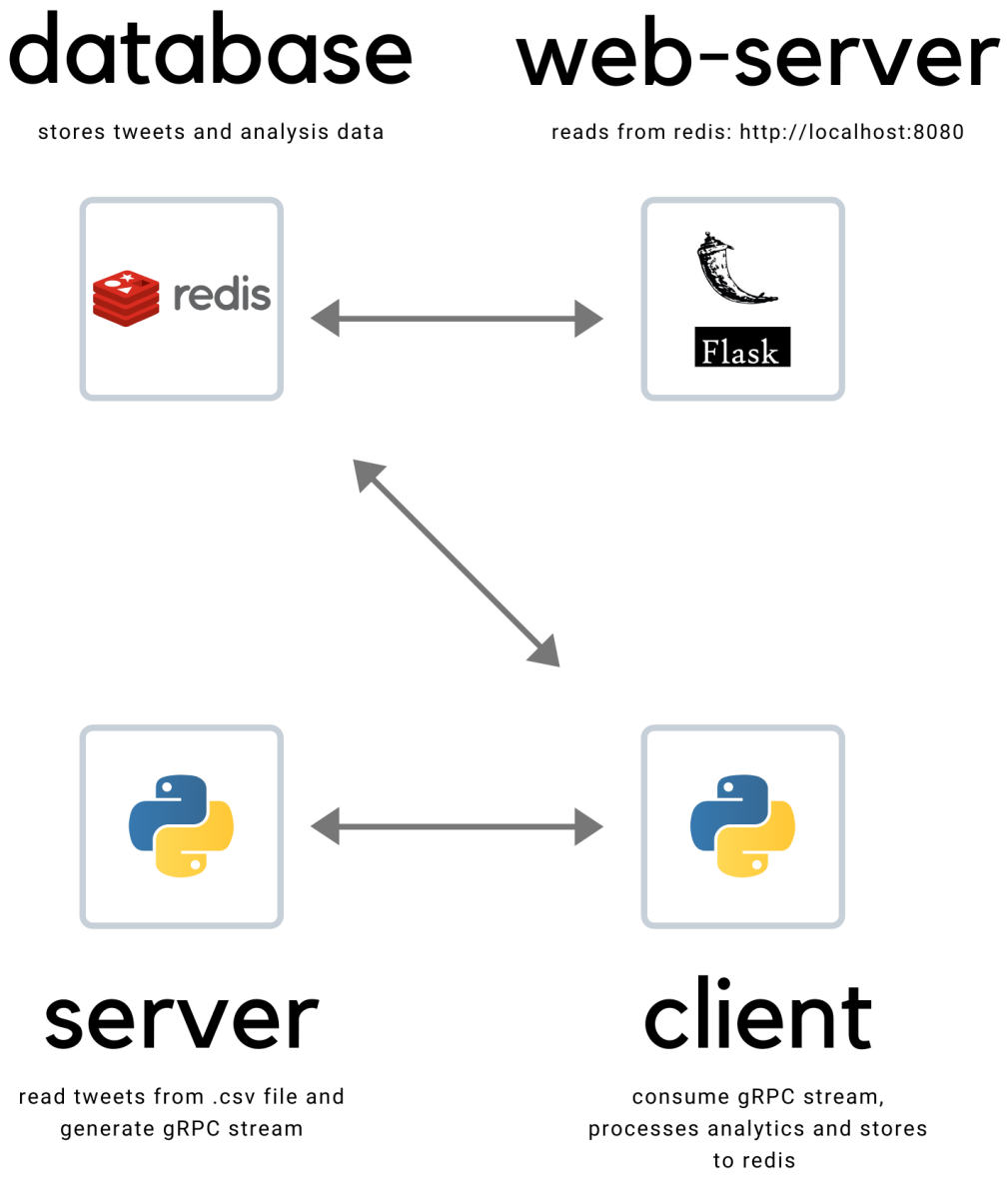
Instructions
Please complete the following form and include in the zip file you submit. Include screenshots / images in the appendices below the form.

Brief discussion of your architecture – why the micro-services you chose, what messages are you passing between them?	I have chosen to implement a server to read the tweets csv and generate the gRPC stream which is then consumed by a client service which live-streams the tweets, processes some analytics and stores tweets/ analytics-results in a redis service. To complete the project I have developed a frontend service with python Flask which reads from redis and displays tweets (http:// localhost:8080). The server is streaming tweets with a 2 seconds delay between each tweet, so if you refresh the frontend you can see new tweets coming in. This architecture allows for separation of concerns where each service is in charge of a limited number of specific tasks. This architecture promotes low coupling and high cohesion where the only dependency is client-depend-on-server for the gRPC stream.
Briefly discuss how far you got with the following functional requirements:	

1. Reading and streaming of the tweet data	Server reads and create gRPC stream which is consumed by client
2. Data analysis; what analytics / metrics did you calculate?	1. Aggregate metric: total tweets been streamed since start of streaming 2. Rolling metric: sentiment within last 3 minutes and translation on current tweet in Italian, Spanish and Dutch (I have used TextBlob library to evaluate sentiment / translate each incoming tweet) 3. Single tweet: longest for the current stream
3. Web page with list or summary of analytics / metrics	The webpage displays the analytics mentioned in functional requirement 2
Checklist:	
I used gRPC	Y
I used streaming with gRPC	Y
I built docker images using Dockerfiles	Y
I orchestrated my application using Docker Compose and a YAML file	Y
Any other comments?	I have investigated gRPC-web and will definitely try implement that in my own time in the future. Unfortunately due to time-constraints I could not successfully complete that part.

Appendix A – Your Architecture Sketch / Diagram



Appendix B – Output from a sample run

```
redis_1               | 1:C 17 Mar 2020 07:19:25.517 # oOOOoOOOoOOOo Redis is starting oOOOoOOOoOOOo
redis_1               | 1:C 17 Mar 2020 07:19:25.517 # Redis version=5.0.7, bits=64, commit=00000000, modified=0, pid=1, just started
redis_1               | 1:C 17 Mar 2020 07:19:25.517 # Warning: no config file specified, using the default config. In order to specify a config file use redis-server /path/to/redis.conf
redis_1               | 1:M 17 Mar 2020 07:19:25.527 * Running mode=standalone, port=6379.
redis_1               | 1:M 17 Mar 2020 07:19:25.527 # WARNING: The TCP backlog setting of 511 cannot be enforced because /proc/sys/net/core/somaxconn is set to the lower value of 128.
tweet_stream_client_1 | wait-for-it.sh: waiting 15 seconds for tweet_stream_server:9999
redis_1               | 1:M 17 Mar 2020 07:19:25.527 # Server initialized
redis_1               | 1:M 17 Mar 2020 07:19:25.527 # WARNING you have Transparent Huge Pages (THP) support enabled in your kernel. This will create latency and memory usage issues with Redis. To fix th
is issue run the command 'echo never > /sys/kernel/mm/transparent_hugepage/enabled' as root, and add it to your /etc/rc.local in order to retain the setting after a reboot. Redis must be restarted after T
HP is disabled.
redis_1               | 1:M 17 Mar 2020 07:19:25.527 * Ready to accept connections
web_server_1          |  * Serving Flask app "web_server" (lazy loading)
web_server_1          |  * Environment: production
web_server_1          |    WARNING: This is a development server. Do not use it in a production deployment.
web_server_1          |    Use a production WSGI server instead.
web_server_1          |  * Debug mode: on
web_server_1          |  * Running on http://0.0.0.0:5000/ (Press CTRL+C to quit)
web_server_1          |  * Restarting with stat
web_server_1          |  * Debugger is active!
web_server_1          |  * Debugger PIN: 265-177-470
tweet_stream_client_1 | wait-for-it.sh: tweet_stream_server:9999 is available after 1 seconds
tweet_stream_client_1 | real-time character count: 115
tweet_stream_client_1 | Client received: @switchfoot http://twitpic.com/2y1zl - Awww, that's a bummer.  You shoulda got David Carr of Third Day to do it. ;D
tweet_stream_client_1 | not translated  HTTP Error 429: Too Many Requests
tweet_stream_client_1 | 0.4
tweet_stream_client_1 | real-time character count: 226
tweet_stream_client_1 | Client received: is upset that he can't update his Facebook by texting it... and might cry as a result  School today also. Blah!
tweet_stream_client_1 | not translated  HTTP Error 429: Too Many Requests
tweet_stream_client_1 | 0.0
tweet_stream_client_1 | real-time character count: 315
tweet_stream_client_1 | Client received: @Kenichan I dived many times for the ball. Managed to save 50%  The rest go out of bounds
tweet_stream_client_1 | not translated  HTTP Error 429: Too Many Requests
tweet_stream_client_1 | 0.5
tweet_stream_client_1 | real-time character count: 362
tweet_stream_client_1 | Client received: my whole body feels itchy and like its on fire
tweet_stream_client_1 | not translated  HTTP Error 429: Too Many Requests
tweet_stream_client_1 | 0.2
```

Appendix C – Screenshot from web page