Arrivals and Services

The enclosed files `Trace1.csv`, `Trace2.csv` and `Trace3.csv` contains two columns: the first is the inter-arrival time between two consecutive jobs to a system, and the second one contains their corresponding service time.

Assuming that jobs are served in order of arrival, one at a time and without interruption, using the results seen last time, compute:

- the **average response time.**
- the **system utilization**.

You should see that, despite the system utilization remains constant, the response time is very different in the three traces: this depends on variability and on the correlation between service times, as seen in this lesson. The reason for which the three traces have the same utilization, while different response time is that, in cases with shorter response time, the system returns idle more frequently, but when idle, it remains idle for a shorter time. Traces with a higher response time, returns idle less frequently, but once idle, they remain idle for a longer time.
Prove the previous statement by computing:

- the frequency at which the system returns idle
- the average idle time

for the three scenarios.

Hints: the frequency at which the system returns idle, can be computed as the ratio between the number of times the system returns idle divided the total time. The number of times the system returns idle, can be computed as the number of time intervals the system had zero jobs (which you probably have already used to compute the busy time). The average idle time, can be computed as the total time the system was idle (T – B), divided by the number of times the system returned idle, computed for the previous point.