# Coursework 2 – Computational Neuroscience

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# Q1

Mean and Standard deviation taken from 100 samples to perform calculations.

## Fano Factor

|  |  |  |
| --- | --- | --- |
|  | Refractory Period 5 ms | No Refractory Period |
| Window Interval 10 ms | 0.7483 ± 0.00216 | 0.9995 ± 0.00414 |
| Window Interval 50 ms | 0.6934 ± 0.00714 | 0.9995 ± 0.00958 |
| Window Interval 100 ms | 0.6873 ± 0.00979 | 1.0015 ± 0.01474 |

## Coefficient of Variance

|  |  |
| --- | --- |
| Refractory Period 5 ms | No Refractory Period |
| 0.826 ± 0.0045 | 0.999 ± 0.0048 |

Solution in *poisson.py*

# Q2

## Fano Factor

|  |  |
| --- | --- |
| Window Interval 10 ms | 1.1159 |
| Window Interval 50 ms | 2.93091 |
| Window Interval 100 ms | 4.1031 |

## Coefficient of Variance

|  |
| --- |
| 2.008 |

Solution in *load.py*

To make this script work locally, store this environment variable first:

*export ABS\_PATH=/path/to/folder/where/data/file/is*

# Q3

A screenshot of a cell phone

Description automatically generated

Solution in “*Q3 – Autocorrelogram.ipynb”* notebook and exported as Python file in *autocorrelogram.py*

# Q4 – Spike-Triggered Average

A screenshot of a cell phone

Description automatically generated

# Q4 - Extra - Pair Spike-Triggered Average

## 2 ms window

The blue curve is overlapped by the orange one.

## A screenshot of a social media post Description automatically generated

## 10 ms window

A close up of a map

Description automatically generated

## 20 ms window

A close up of a map

Description automatically generated

## 50 ms window

A close up of a map

Description automatically generated

Solution in “*Q4 – Spike\_triggered\_average.ipynb”* notebook and exported as Python file in *spike\_triffered\_average.py*