PYTHON EXERCISE

RANDOM WALKS IN MONTE CARLO

03 – RESULTS ANALYSIS

In this part, we are interested in more in-depth analysis of the created results. Therefore, create at least 10,000 walks for each maximum length up to 50. We analyze these created walks using comprehensions and answer the following questions:

- How many roundtrips of length 4 (including duplicates) have been generated? Roundtrips are tours of a distance of zero from the starting position and the length of a roundtrip is the number of walked blocks.
- Which different (unique) roundtrips have been identified for the different maximum lengths? List the number of identified unique roundtrips for each maximum length and the first 10 roundtrips per maximum length (the others can be omitted).
- What is the average and median[1] distance for walks of maximum lengths 5, 10, 15, 20, 25?
- What is the percentage of walks that end at a position with a maximum possible distance from the starting distance per maximum walk length?
- Which distinct straight walks have been generated; walks that continue in the same direction? Therefore, you have to implement a predicate function `def checkEqual(iterator)` that checks whether an iterator consists only of one different element. Try to avoid additional memory allocation within the checkEqual function.

Hints:

- A roundtrip is a walk that ends at the starting position
- Explain the workings of the developed comprehension within the documentation.
- The source file should be called Result_Analysis.py

[1] https://docs.python.org/3/library/statistics.html