Computational Physics – Exercise 2: Event-based simulation I

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Exercise

- Consider a symmetric 1D random walk of $N_{\text{part}} = 10000$
- Each particle makes $N = 1000$ jumps, starting at the origin. Initialize the random number generator with seed=wxyz, where wxyz are the last four digits of your matricle number.
- Plot $\langle x^2 \rangle - \langle x \rangle^2$ as a function of N
- How does the result compare to what you expect from the analytical result?

Exercise

- Some technical issues:
  - What is the required length of the 1D lattice if each particle makes N jumps, starting at the origin ?

Report

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- Filename: Follow the instructions given by the tutors
- Content of the report:
  - Names + matricle numbers + e-mail addresses + title
  - Introduction: describe briefly the problem you are modeling and simulating (write in complete sentences)
  - Simulation model and method: describe briefly the model and simulation method (write in complete sentences)
  - Simulation results: show figures (use grids, with figure captions !) depicting the simulation results. Give a brief description of the results (write in complete sentences)
  - Discussion: summarize your findings
  - Appendix: Include the listing of the program

Due date: 10 AM, April 30, 2024