University of Hull

Report to Analyse the Simulation of Random Growth of Cells

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Programming Assignment

Computational Science 600093

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**Introduction**

Computational science is the discipline within computer science that advances knowledge in various scientific fields through complex computational analysis, modelling, simulation, and numerical approximation (Plonus, 2007). As a result, it can provide innovative solutions to problems by using powerful computers to replace or complement traditional modelling and experimental methods.

This study aims to understand the different complexities that encapsulate growth simulations and how they can be applied to real-world scenarios. We shall build upon various random grid walk models to understand random movement, which can be further applied to random cell growth, simulating a disease such as a cancer tumour. In addition, the Gompertz model will support this simulation by applying more realistic characteristics, such as time, cell capacity, and growth rate. Combining these methods shall form a basic simulation of how a cancer tumour can start to grow and multiply over time in a living organism. Thus, aims to provide more insight into cell growth that can be applied to real-world situations.

**Task 1**

**References**

1. Plonus, M. (May 2007) The Digital Computer, Electronics and Communications for Scientists and Engineers. Available online: <https://www.sciencedirect.com/science/article/abs/pii/B9780125330848500197> [Accesses: 13/12/2024]