Tutorial 1 On-site Questions

1. A sequence is generated using the following recursive relation

$$x_n = 2x_{n-1} - x_{n-2} + 5, \quad \text{for} \quad n \geq 3,$$

with $x_1 = 0$ and $x_2 = 1$.

   (a) Use "for" loop in R to find the 30th term of the series.

   (b) Find the smallest value of n such that $x_n \geq 1,000$.

2. Consider another sequence which is generated using the following recursive relation $y_1 = 2800 + 1.02 \times y_0$, with $y_0 = 10000$ and

$$y_n = 2800 + 1.02 \times y_{n-1}, \quad \text{for} \quad n \geq 2.$$

   Find the smallest value of n such that $y_n \geq 300,000$.