C1. Using the iterative (fixed point) method on the interval $[a, b] = [0.5,0.6]$ with $x_0 = 0.5$, find a number of iterations sufficient to find the real solution of $x = e^{-x}$ accurate to 0.001.
Also show the first 3 iterations and the solution to that accuracy.

C2. Let $T_n(x) = \sum_{k=0}^{n} \frac{(-x)^k}{k!}$ be n th degree Taylor polynomial of e^{-x} at $x = 0$ and $\lim_{n\to\infty} T_n(x) = e^{-x}$.
Solve $x = T_2(x)$ and find an approximate solution to $x = e^{-x}$.
Also find a n for which the difference in the solutions to $x = T_n(x)$ and $x = e^{-x}$ is less than 0.001.
Assume that one real solution to $x = T_n(x)$ remain in $[0.5,0.6]$ for all $n \geq 2$.