4. Write a computer program that solves the Lorenz equations:

$$\begin{cases} \dfrac{dx}{dt} = -3\big(x(t) - y(t)\big) \\ \dfrac{dy}{dt} = 26.5x(t) - y(t) - x(t)z(t), \;\; x(0) = z(0) = 0, \;\; y(0) = 1 \quad t \in [0,100] \\ \dfrac{dz}{dt} = x(t)y(t) - z(t) \end{cases}$$

Implement in the code numerical Runge-Kutta explicit methods of 2nd and 4th order with the grid step that will provide the maximum relative error less than 10^{-8}:

$$\max_{k=1,10} \left(\left| x_k(N) - x_k(N/2) \right| + \left| y_k(N) - y_k(N/2) \right| + \left| z_k(N) - z_k(N/2) \right| \right) < 10^{-8}$$

Provide the functionality of printing the array of the relative errors onto the console in the format

-- in the first line print the grid number of the final array (e.g. "N = N"),

-- in the second line print the relative error values for the final array in the time moments: $t_1 = 10, \; t_2 = 20, \ldots, t_{10} = 100$, separated by spaces, without the space after the last item.

Provide the functionality of plotting the phase trajectory of the solution on the $3D$ plane $\{x(t), y(t), z(t)\}$ at $t \in [0,100]$.