Quiz 2 name:

1. *(From state space to transfer function)*
   Find the transfer function H of a system defined by a state-space representation with parameters

$$A = \begin{bmatrix} 1/2 & 0 \\ 0 & 1/4 \end{bmatrix}, \quad B = \begin{bmatrix} 1 \\ 0 \end{bmatrix}, \quad C = \begin{bmatrix} 1 & 0 \end{bmatrix}, \quad D = 1. \qquad (*)$$

2. *(From state space to impulse response)*
   Find the impulse response h of the state space model with parameters $(*)$.

3. *Order of linear time-invariant system)*

   - What is the order of the state space model with parameters $(*)$?

   - What is the order of the transfer function model computed in problem 1?

4. *(Detecting static relation)*

   - Given a trajectory $w = \big(w(1), \ldots, w(T)\big)$ of unknown discrte-time linear time-invariant system, how can you check if the system is static?

   - Describe a computational method that does the job.

   - Write Matlab code that implements the method.