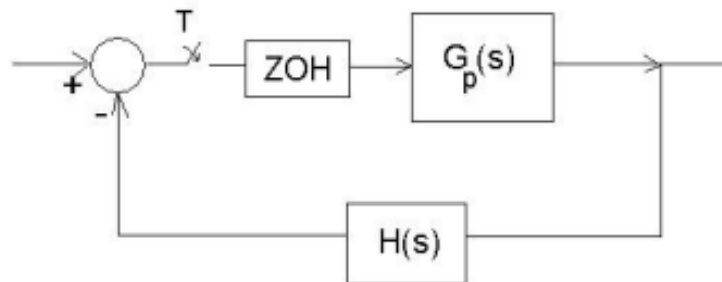




MATLAB Control Project



Consider the control loop shown above with:

$$G_p(s) = \frac{4}{(2s + 1)(0.5s + 1)} \quad , \quad H(s) = \frac{1}{0.05s + 1} \quad \text{and} \quad T = 0.1s$$

Using MATLAB, design a compensator such that the closed-loop sampled data system has a steady-state error of **10%** to a unit-step input and a phase margin of at least **50°**. Plot and comment on the step-response before and after compensation.

Notes:

- You must submit **ONLY ONE PDF FILE** containing all the figures and your comments.
- You must include your **MATLAB Code** at the end of the project (**Text not screen-shot**) and **Readme File for showing how to run it.**
- No hand analysis is required.
- **Each team is made up of two students (single student is not allowed)**
- Include your name (in Arabic) and StdId in the front page of the report.
- Name your report with your IDs (Ex: 9181294_9181293_control).
- You must use **MATLAB SISO** tool, **c2d** and **d2c** commands.
- The report will be delivered via this form: <https://forms.gle/7vSSBo7jErVZorn78>
- The deadline is on Friday 5th December 2025 at 11:59 pm.
- **Zero for any duplicated reports.**
- **50% reduction of the project mark for the late delivery (max 2 days after the deadline)**