Performance modelling of a microcontroller.

Let us consider a microcontroller running a simplified Operative System. The S.O. can be either configured to run concurrent tasks either in FCFS or Round Robin with a short quantum that can be approximated by Processor Sharing (PS).

Each task has an average duration of *1 second*, and the workload arrives according to a Poisson process (exponential inter-arrival time), with a variable rate. The microcontroller can be used in two scenarios (called A and B), where tasks have different duration distributions.

Inter-arrival time distribution	Exponential with rate ranging from $\lambda = 0.1$ tasks per second to $\lambda = 0.9$ tasks per second
Task length distribution for Scenario A	Hyper-Exponential, with C.v. 4
Task length distribution for Scenario B	Erlang distribution, with C.v. 0.25

Questions:

1. Consider the four scenario that uses the two configurations (FCFS or PS) with the two Scenarios (A and B). Plot (in a single graph) the average response time as function of the arrival rate. Use Excel or another graphing software to superpose the values computed by JMT.
2. Which is the best configuration of the S.O. for Scenario A?
3. Which is the best configuration of the S.O. for Scenario B?
4. Comment the results

Please enter the answers, together with a ZIP file containing the .jsimg files of your model, renamed with PPTX extension, in the following form:

https://forms.office.com/Pages/ResponsePage.aspx?id=K3EXCvNtXUKAjjCd8ope67-7CBR7gDJEgHF_krAEqPhURTFaS0dPVTRQUDVWQ0c1SzhGQVpXV1JUNi4u

The deadline is **Midnight, 18/10/2025**