You need to form a group of 5 students or less to conduct the assignment. More than 5 students are not allowed.

For this assignment, students must use **A**lgebraic **M**athematical **P**rogramming **L**anguage (**AMPL**) tool for simulation. Your task is to find a published ISI journal (within last 5 years) in Web of Science on the subject of applied Optimal Control as reference.

You should select only one of these area for the journal :

1. Cancer Chemotherapy
2. Disease Epidemic (i.e. Covid, Bird flu etc.)
3. Electric Vehicle

**Assignment (15 %)**

For all the area above, you should be able to obtain the **objective function** (given in the journal(you can also modify the objective with justification)) to be optimized with **state equation** known given in the journal. There should be at-least 2 states in the problem.

Atleast **one** of the **state** must be **constrained** or you can suggest to constrain with justification if the paper you chose as reference does not contain constraint.

There are two cases in this assignment:

**Case I**

Solve the problem without constraint, then

**Case II**

Solve the problem with constraint

For each case that you are attempting to simulate, you are required to:

1. **Formulate** the objective function value switching equation and co-state equation. (C6)
2. **Plot** the state, co-state and switching condition against time graphically. (C4)
3. **Identify** the time the state hits the constraint /and/or the time when state escapes the constraint using the graph. (C4)

**Report(15 %)**

You are required to analyze and investigate your work in assignment. Please prepare a report within 500 words, double spacing , Times Roman font size 12. The report should mainly consider:

1. **Analyze** the results obtained in terms of objective function value for both cases. (C4)
2. **Investigate** the difference in the results of both cases. (C4)