Aalto University
School of Science

Assignment 1
Optimal flight with a glider

Assignment practicalities

MS-E2132 Laboratory Assignments in Operations Research II

Working in pairs

- The assignments on this course are completed in pairs
  - If necessary, there can be one group of three
- Grading is done in pairs, i.e., the same grade for both students
- Preferably work with the same pair throughout the course
- Discuss scheduling and work distribution with your pair
  - Both students participate in both assignments
- Guidelines for forming the pairs at the end of this lecture

Completing the assignment

- Explore and study the topic of the assignment, brush up and revise earlier studies
  - https://mycourses.aalto.fi/course/view.php?id=32121 (Dynamic Optimization)
  - https://mycourses.aalto.fi/course/view.php?id=32920 (Nonlinear Optimization)
  - https://www.grc.nasa.gov/WWW/K-12/airplane/glider.html (Gliders – NASA)
- Read and familiarize yourself with the assignment instructions and supplementary materials

Schedule

Date	Event
Wednesday 7.9.2022	Introductory lecture
Friday 21.10.2022	DL for reports at 18:00

- Reserve enough time to complete the assignment
  - According to feedback from previous years, the assignment is interesting but laborious
- **Start working on the assignment in time!**

Assistant's reception hours

- In Y344 on Wednesdays at 14:15 – (16:00)
  - Individual guidance for each group
  - If nobody shows up during the first 30 minutes, the assistant may leave
- At other times or remotely by appointment
- E-mail (mikko.harju@aalto.fi)
- Any problems related to the course
  - Questions about the assignment instructions
  - Problems related to MATLAB

MATLAB (& Simulink)

- Implementations using MATLAB
- If you don't have MATLAB installed:
  - Instructions for download and installation given on the MyCourses page of this course
  - When installing, install also at least the following toolboxes/add-ons (needed for the assignments of this course):
    - Optimization toolbox
    - Simulink
  - Installation requires at least 10 GB of free space
- Preferably update existing MATLAB installations to the latest release

Writing the report

- Answer **<u>all the questions</u>** given in the assignment instructions
  - Many short questions, read the instructions carefully
- Justify your answers
  - Show that you understand the problem and the solution
- Remember to comment on all figures
- Return the project work via MyCourses
  - The complete report (.pdf)
  - All MATLAB-files (.zip)
    - All the relevant code should be run when the flight_main.m and tflight_main.m scripts are executed

Grading

- All tasks must be completed, and questions answered
  - Each task is graded separately, but extra points can be awarded for particularly good answers
- All required figures must be included
- Demonstrate understanding
- The assignment is graded based on the first submission
  - Significant flaws or shortcomings must be corrected before passing the course
- The grade for the course is determined based on the average of the two assignments

Forming the pairs

- You are free to choose your pair
- Report to the assistant one of the following:
  - You know who you are working with (enough that one of you sends a message with both names)
  - You don't have a pair but would like to have one, the assistant will help you to find a pair
  - You would like to work alone (allowed but not recommended)

➔ Send a message to mikko.harju@aalto.fi

- Deadline **9.9.2022**