

General instructions for the CFD Projects

The project is a CFD analysis task. It is presented in engineering terms with a rough idea about the aim with the analysis. Your job as a group is to refine the rough idea, formulate a proper problem, and then carry out the problem solution with modern CFD software. Groups are strongly urged to plan their work to enable a presentation according to schedule.

1. Task refinement, initial analysis and problem formulation.
 - (a) A web search for relevant material, similar cases, interesting experiments; collection of books/papers/manuals/ which may be useful.
 - (b) Discussion of relevant flow model. (Inviscid? Potential flow? Steady? Turbulent? Compressible? Isothermal?)
 - (c) Choice of appropriate boundary and initial conditions.
 - (d) Discussion of discretization scheme in space and time related to what is available in the CFD code. E.g. 1-st order upwind is not good enough.
 - (e) Discussion about the grid requirements and choice of grid resolution.
 - (f) Code specifics. Find out how the code runs on the computers available.
 - (g) Explanation on how you propose to verify the computed results. E.g. mesh refinement is necessary.
2. Computational model set-up, CFD analysis, result presentation.
 - (a) Construct a mesh according to the requirement
 - (b) Run the first computations and check that the result looks reasonable. Be prepared to further refine and redo the computations several times.
 - (c) Analyze the results quantitatively, discuss possible sources of errors. Reconsider the choice of mesh, model and method.
3. Perform a parameter study for different grids, models or methods.
4. Final report must be handed in at the project workshop 22 May. Each project group will do a 10 min presentation of the project (7 min presentation + 3 min questions).

The project should be planned with an eye on the time schedule. **DO** consult with your project leader! **DO** apply common sense and back-of-the-envelope calculations to see that you are on the right track! **DO NOT** leave it to the last day to put together the text and pictures / plots you want in your final report.