Instructions for "userinput_data.txt"

The "userinput_data.txt" is the text file where the users can input their data.

1. Line no. 1 ⇒ The iteration number where the simulation has to start. For a new simulation, this will be 1.
2. Line no. 2 ⇒ Total number of iterations
3. Line no. 3 ⇒ It indicates the iteration interval for which result file has to be written. If result file has to be written for every 5000 iteration, enter 5000.
4. Line no. 4 ⇒ Non-dimensional density $=\rho/\rho_\infty$
5. Line no. 5 ⇒ $(\rho * u)/(\rho_\infty * u_\infty)$ where u represents velocity in $x-$ direction
6. Line no. 6 ⇒ $(\rho * v)/(\rho_\infty * u_\infty)$ where v represents velocity in $y-$ direction
7. Line no. 7 ⇒ $(\rho * w)/(\rho_\infty * u_\infty)$ where w represents velocity in $z-$ direction
8. Line no. 8 ⇒ Non-dimensional specific total energy $= E/(u_\infty^2)$
9. Line no. 9 ⇒ Reynolds number
10. Line no. 10 ⇒ Mach number
11. Line no. 11 ⇒ Prandtl number
12. Line no. 12 ⇒ Time step size, Δt
13. Line no. 13 ⇒ If periodic boundary conditions are present, give 1, else 0.

Instructions for gambit file

Follow the following instructions while creating mesh file from gambit

1. Name the .msh file as msh_gambitfile.txt
2. Name the .neu file as mesh_file.txt
3. Follow the below mentioned naming conventions for boundary surfaces:

- For wall surfaces perpendicular to x-direction, name them as flat_wall_nx1, flat_wall_nx2, and so on.
- For wall surfaces perpendicular to y-direction, name them as flat_wall_ny1, flat_wall_ny2, and so on.
- For wall surfaces perpendicular to z-direction, name them as flat_wall_nz1, flat_wall_nz2, and so on.
- For walls, which are curved, name them as curved_wall1, curved_wall2, and so on.
- For inflow surfaces perpendicular to x-direction, name them as flat_inflow_nx1, flat_inflow_nx2, and so on.

- For inflow surfaces perpendicular to y-direction, name them as flat_inflow_ny1, flat_inflow_ny2, and so on.
- For inflow surfaces perpendicular to z-direction, name them as flat_inflow_nz1, flat_inflow_nz2, and so on.
- For inflow surfaces, which are curved, name them as curved_inflow1, curved_inflow2, and so on.
- For outflow surfaces perpendicular to x-direction, name them as flat_outflow_nx1, flat_outflow_nx2, and so on.
- For outflow surfaces perpendicular to y-direction, name them as flat_outflow_ny1, flat_outflow_ny2, and so on.
- For outflow surfaces perpendicular to z-direction, name them as flat_outflow_nz1, flat_outflow_nz2, and so on.
- For outflow surfaces, which are curved, name them as curved_outflow1, curved_outflow2, and so on.
- For farfield surfaces perpendicular to x-direction, name them as flat_upper_nx1, flat_upper _nx2, and so on.
- For farfield surfaces perpendicular to y-direction, name them as flat_upper_ny1, flat_upper_ny2, and so on.
- For farfield surfaces perpendicular to z-direction, name them as flat_upper_nz1, flat_upper_nz2, and so on.
- For farfield surfaces, which are curved, name them as curved_upper 1, curved_ upper 2, and so on.
- For periodic surfaces, name them as periodic1, periodic2,and so on.

Other general instructions

Instructions with regard to output files are given below

1. The convergence file is written as error.txt.
2. The result file is written as result_n.txt, where n indicates the iteration number. Line number 1 contains data corresponding to element no 1. Similarly, line number 2

contains data corresponding to element no 2, and so on. The first column corresponds to non-dimensional density $=\rho/\rho_\infty$, second column corresponds to $(\rho * u)/(\rho_\infty * u_\infty)$, third column to $(\rho * v)/(\rho_\infty * u_\infty)$, fourth column to $(\rho * w)/(\rho_\infty * u_\infty)$, and the last one to non-dimensional specific total energy $= E/(u_\infty^2)$.

3. The result file in tecplot format is written as resultplt_n.plt, where n indicates the iteration number.

4. The details of back up recovery data is written in recovery.txt. Refer to this file and give the last written iteration number (Last written iteration number+1) as the start iteration while restarting the numerical simulation.