CGflow2D desktop version

Cartesian Grid flow solver

Desktop based Computational Fluid Dynamics simulation

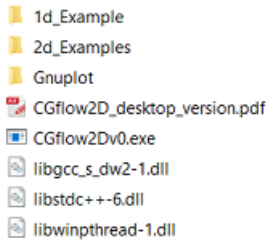
1 What's this:

CGflow2D v0.0 demo version is a free to use desktop based CFD simulation executable. Unlike mobile app based CGflow2D there is no GUI for desktop version instead it is fully command based. Once you run the executable, it will automatically request for user inputs that are required to run the simulation. Once the run completes all the primitive quantities, inputs supplied and mesh file will be written out as text file. Later these files can be used to view the results in Gnuplot.

Since this is a demo version user can run five standard cases for now,
1D- Shocktube
2D- Cases:
1. Flowpast square
2. Pipeflow
3. Backward facing step
4. Lid driven cavity
5. Shocktube

2 Contents in the zip folder:

The zip folder contains the main executable named "CGflow2Dv0.exe", two folders containing 1D and 2D example cases, Gnuplot exe and .dll's that supports the executable to run.



3 Commands required for Gnuplot:

1. To view the Line plot for 1D case:
p 'filename.txt' using 1:2 w lp lt 6 pt 7 ps 1.5

2. To view the 2d mesh:
plot 'filename.txt' u 1:2:(0.2*($3)) w circles lc rgb "red"

3. To view the contour plots:
splot 'filename.txt' matrix with image

3.1 Setting views in Gnuplot:

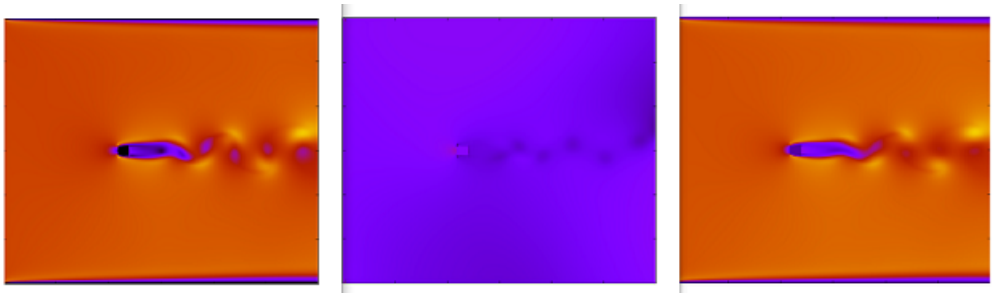
In the Gnuplot terminal type the following:
set view 180,90,1.5
set size square

4 How to run the exe:

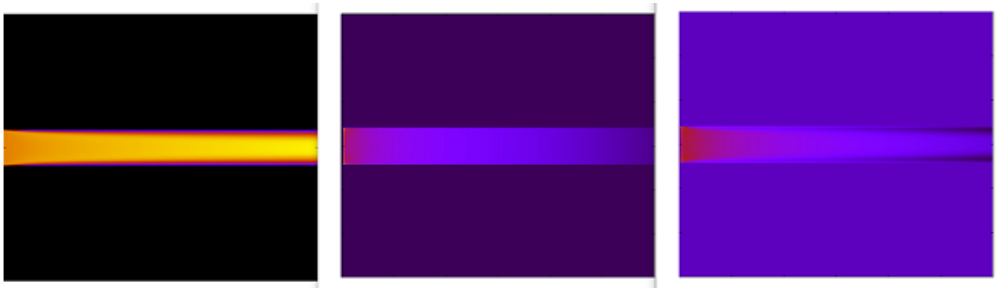
1. Double click exe, a command window will open and waiting for user input.
2. Navigate to 2D_Examples folder, open one of the cases and you will find a text file with name "Input_settings.txt".
3. Use these input details and manually enter the values in the command window one by one.
4. At the end of run the command window will automatically close and dumps several text files. Later these files can be used to view the simulation results using Gnuplot.

5 Some result images:

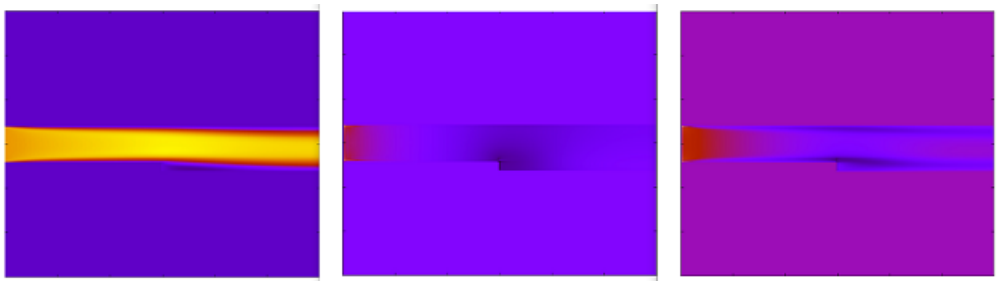
5.1 Flowpast square:(Mag velocity, Pressure, U velocity)



5.2 Pipeflow:(Mag velocity, Pressure, Density)



5.3 Backward facing step:(U velocity, Pressure, Density)



5.4 Lid driven cavity:(Mag velocity, U velocity, V velocity)

5.5 Shocktube:(Density, Pressure, U velocity)

**All the images are from the results stored in 2D examples folder