

# **Assignment 7**

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# 1 Flow over a cylinder:Method1

Method 1 is where we advect first and diffuse for a full time step.

## 1.1 Vortex positions

Positions of vortices at  $t=1,3,5$  are shown

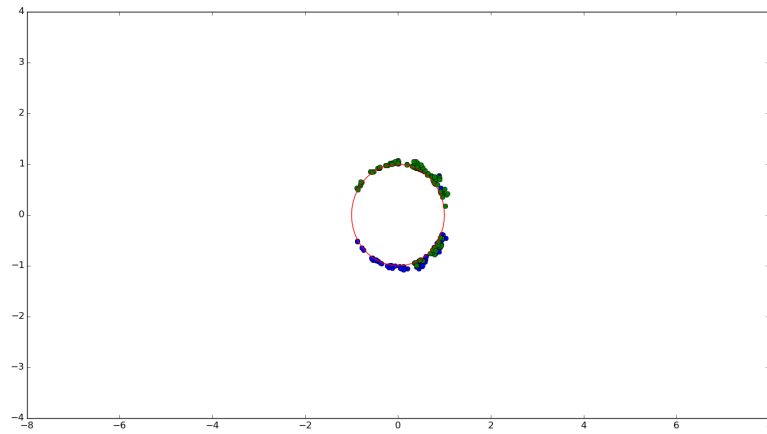


Figure 1: Vortices at  $t=1s$

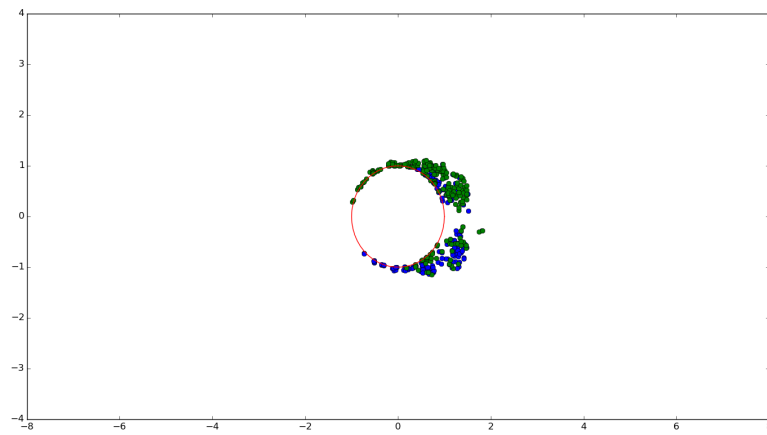


Figure 2: Vortices at  $t=3s$

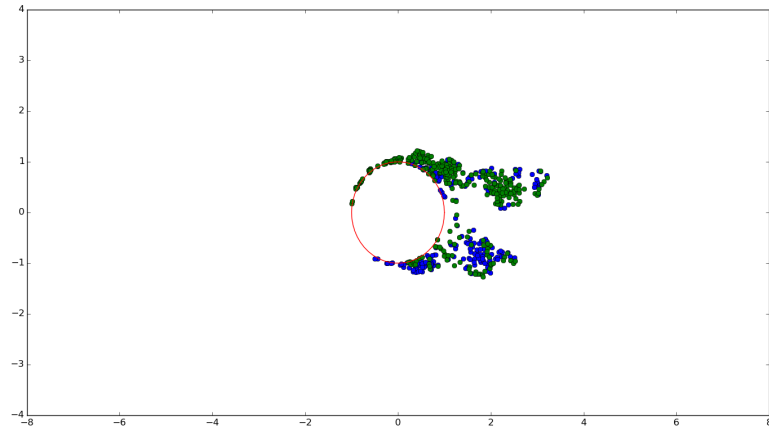


Figure 3: Vortices at  $t=5s$

## 1.2 Velocity Contours

Velocity contours and velocity contours only in the right half plane are shown at  $t=5s$

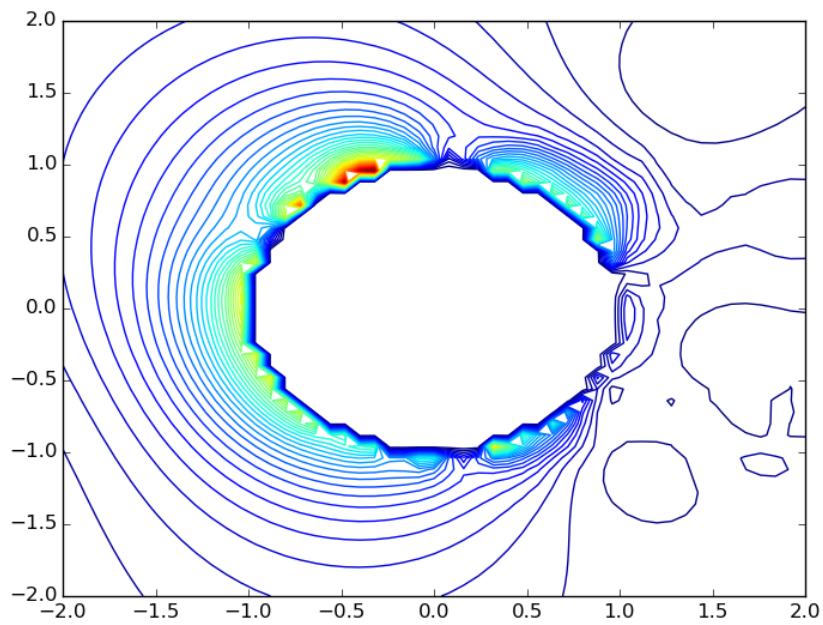


Figure 4: Velocity Contours at  $t= 5s$

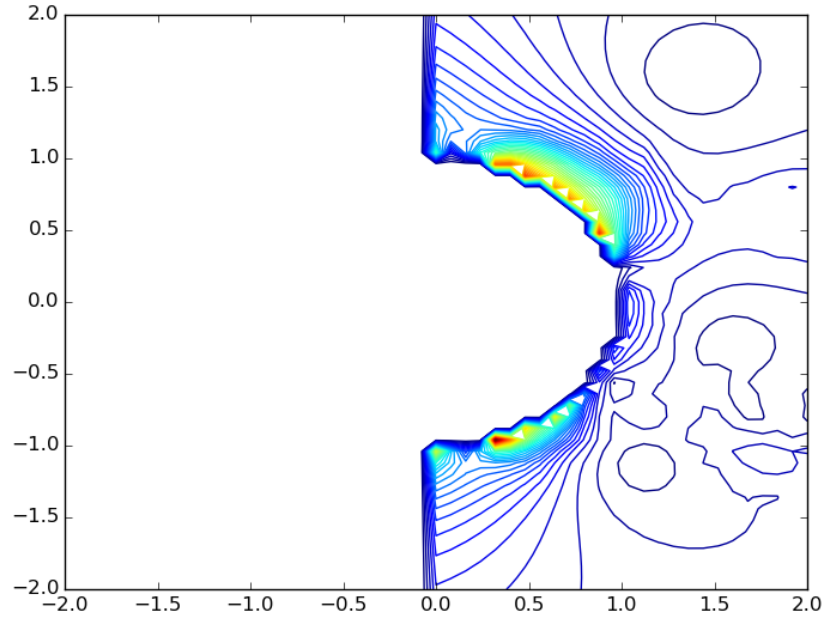
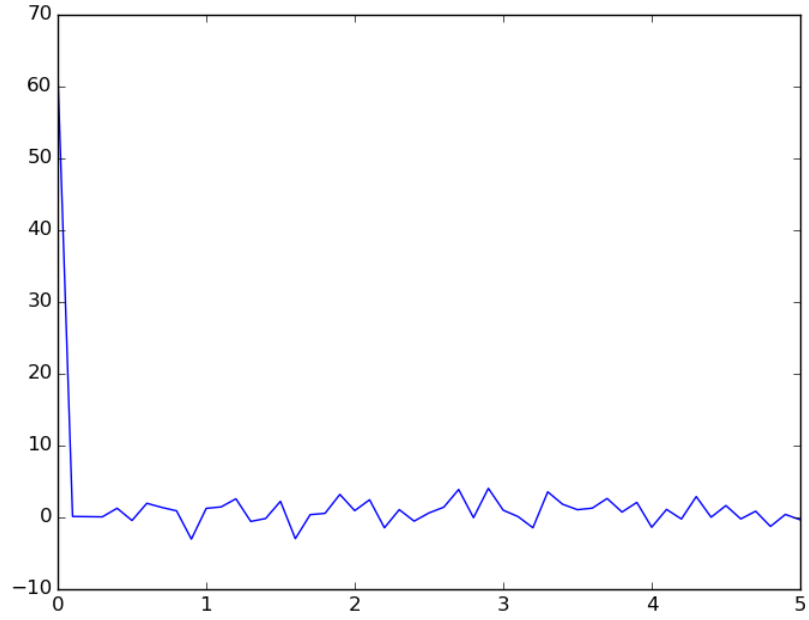


Figure 5: Velocity Contours in the right half plane at  $t= 5$ s

### 1.3 Drag Coefficient

Variation of drag coefficient with time is shown



## 2 Flow over a cylinder:Method2

Method 2 is where we advect first for half time step and diffuse for a full time step.

### 2.1 Vortex positions

Positions of vortices at  $t=1,3,5$  are shown

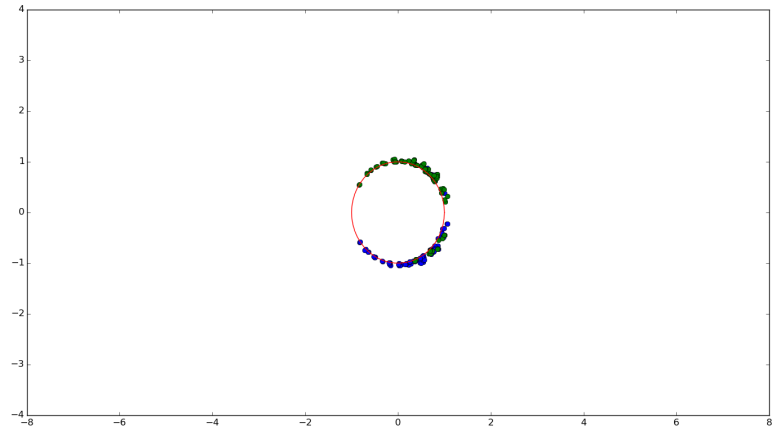


Figure 6: Vortices at  $t=1s$

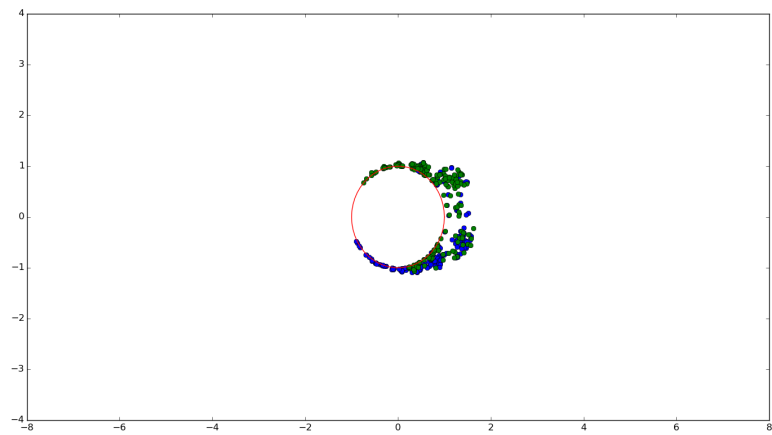


Figure 7: Vortices at  $t=3s$

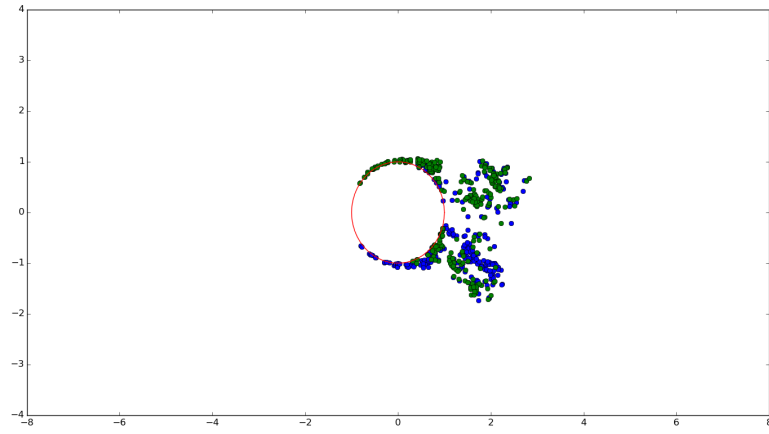


Figure 8: Vortices at  $t=5s$

## 2.2 Velocity Contours

Velocity contours and velocity contours only in the right half plane are shown at  $t=5s$

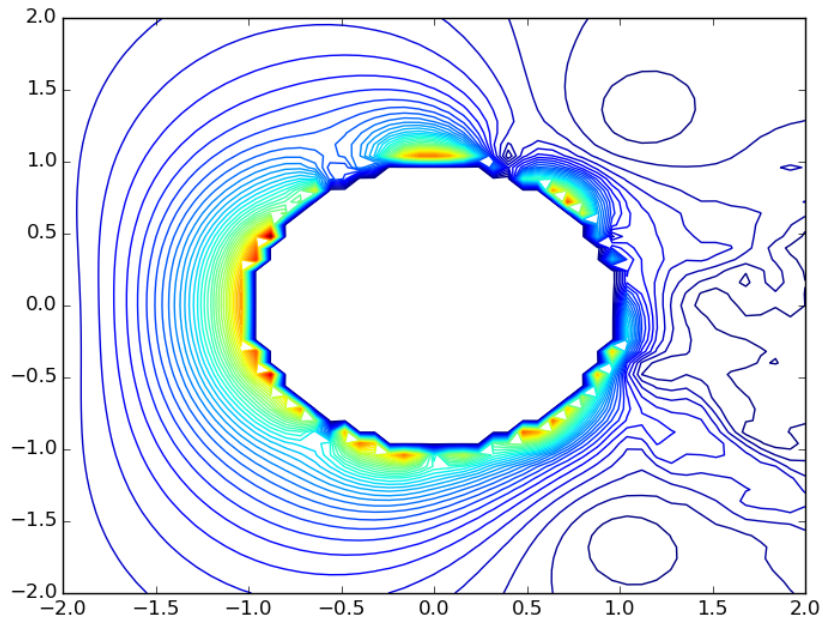


Figure 9: Velocity Contours at  $t= 5s$

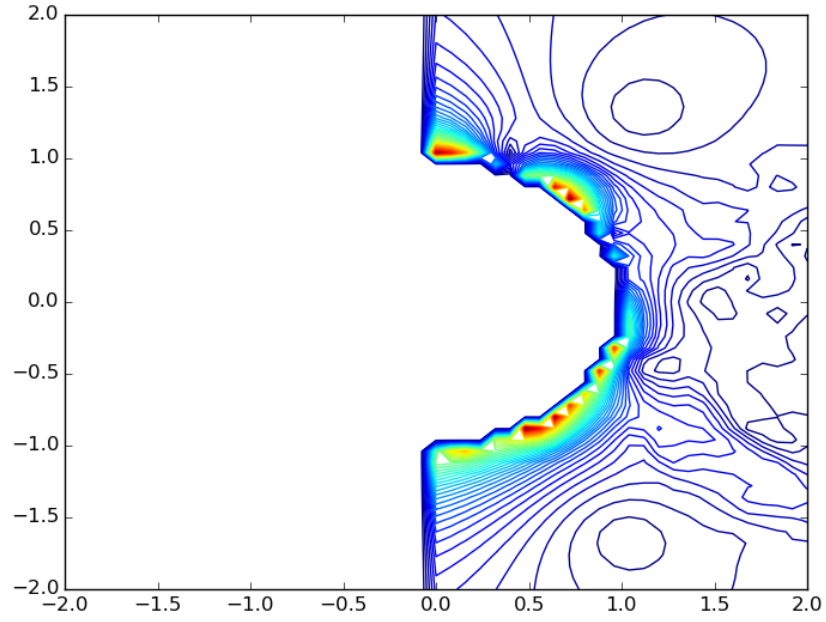


Figure 10: Velocity Contours in the right half plane at  $t= 5$ s

### 2.3 Drag Coefficient

Variation of drag coefficient with time is shown



