# Computational Aerodynamics Questions & Answers

### Question by Student 201427564

*Professor, I have a question about Question#2. Is it possible that $P_{i+1}$ increase while $P_{i-1}$ decrease?*

I guess you mean an increase/decrease from one mesh level to the other? Yes, it's possible. This means the derivative is becoming larger. 1 point bonus.

### Question by Student 201427564

*Professor, I have a qeustion about calculating 'p'. In your table, $r = \frac{\Delta x_c}{\Delta x_f}$. By this definition, is it correct that $r = \frac{1}{\sqrt{2}}$ ? Because the fine one is $\sqrt{2}$ times more fine than coarse one.*

No, it's the opposite.. This was mentioned in class.

### Question by Student 201238707

*Professor, When I start "Assignment 7 - Question #2". I just use $(R_\Delta)_{\max} = 1E-3$ or find convergence value of $(R_\Delta)_{\max}$*

You can keep xiverge set to 1E-3. 1 point bonus.

### Question by Student 201527110

*Professor, I don't understant what does 'Semi Disc. equation' exactly what we do last lecture. Usually, scalar equation can be denoted as*

$$\frac{\partial u}{\partial t} + a\frac{\partial u}{\partial x} = 0$$

*, but I wonder why we didn't considered about wave speed 'a' in 'Semi Disc. equation'. (I think you noted semi disc eq as $\frac{u_i^{n+1}-u_i}{\delta t} + \frac{u_{i+1/2}-u_{i-1/2}}{\delta x} = 0$)*

That's a mistake: I should have added the sound speed of course. Please correct your notes. Because it is constant, an easy way to add the sound speed is to change $\Delta t$ to $a\Delta t$ everywhere $\Delta t$ appears. This will make more sense! 2 points bonus.

**Question by Student 201427564**

*Professor, when you explain about 'Roe Average', you wrote like this.* $A_{i+\frac{1}{2}}(U_{i+1}-U_i)=F_{i+1}-F_i$*. I can not understand that how can it be possible that* $A_{i+\frac{1}{2}}U_{i+1}=F_{i+1}$ *and* $A_{i+\frac{1}{2}}U_i=F_i$ *. Because subscript of* $A$ *and* $U$ *are different each other.*

Hm, I don't understand the question. You need to explain better what you don't understand..

**Question by Student 201427564**

*Oh.. I mean How can it be possible that* $A_{i+\frac{1}{2}}U_{i+1}=F_{i+1}$ *rather than* $F_{i+\frac{1}{2}}$ *. Are there any rules?*

I'm not sure what you mean. But it is not correct that $A_{i+1/2}U_{i+1}=F_{i+1}$. This is not the Roe average. The Roe average if $\Delta F=A_{i+1/2}\Delta U$. I'll give you 0.5 point for the effort.