REPORT

학과: 항공기계공학과

과목: 전산유체해석실습

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제출날짜: 10/20 (월)

CHEONGJU UNIVERSITY

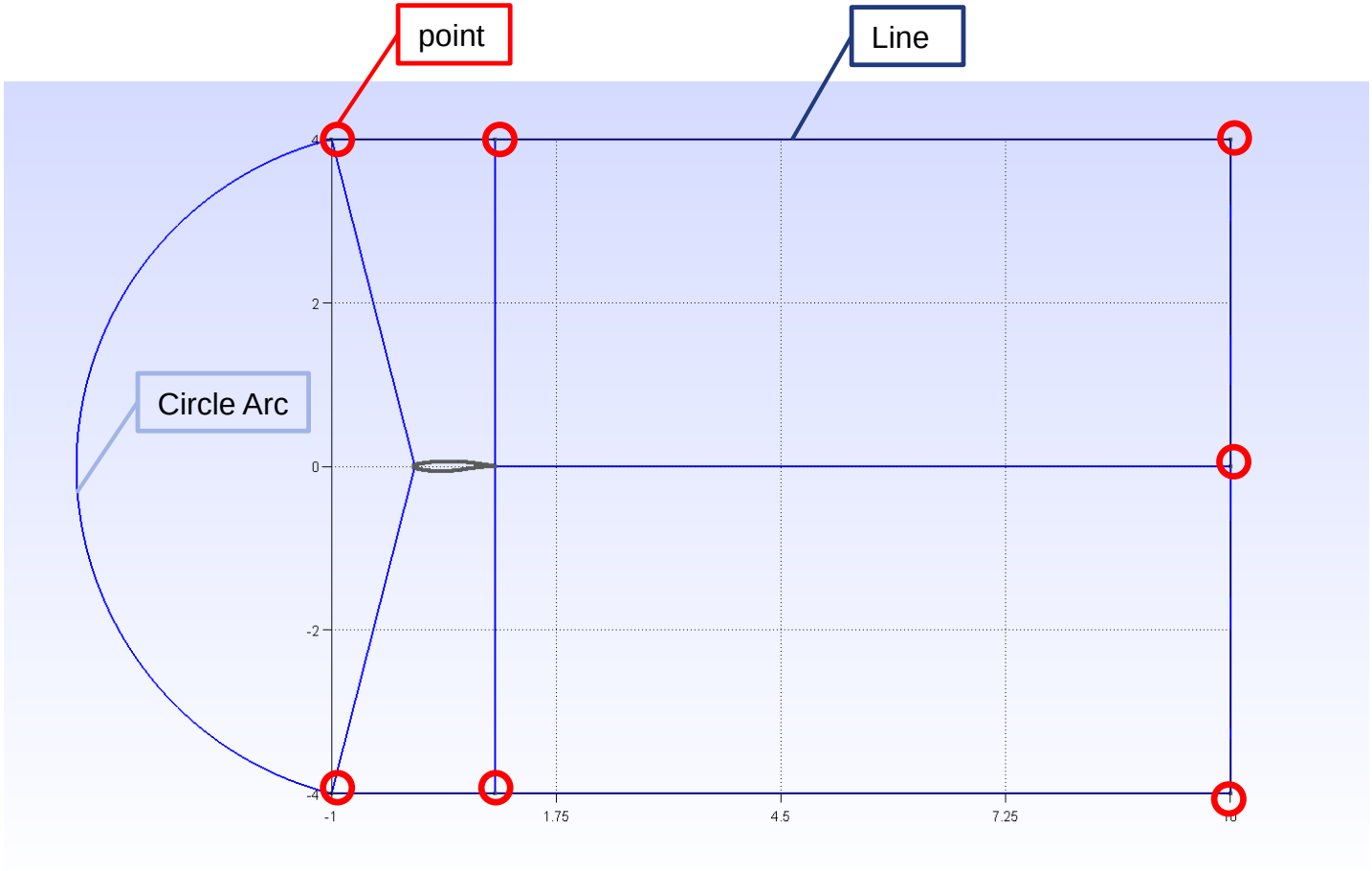
Airfoil 2822

```
ymax = 4;
xmax = 10;
n_inlet = 60;
n_vertical = 90;
r_vertical = 1/0.95;
n_airfoil = 50;
n_wake = 100;
r_wake = 1/0.95;
//+
Point(129) = {-1, ymax, 0, 1.0};
//+
Point(130) = {-1, -ymax, 0, 1.0};
//+
Point(131) = {1, ymax, 0, 1.0};
//+
Point(132) = {1, -ymax, 0, 1.0};
//+
Point(133) = {xmax, ymax, 0, 1.0};
//+
Point(134) = {xmax, -ymax, 0, 1.0};
//+
Point(135) = {xmax, 0, 0, 1.0};
```

[Point 지정]

```
//+
Circle(2) = {130, 64, 129};
//+
Line(3) = {129, 131};
//+
Line(4) = {131, 133};
//+
Line(5) = {135, 133};
//+
Line(6) = {135, 134};
//+
Line(7) = {130, 132};
//+
Line(8) = {132, 134};
//+
Line(9) = {59, 129};
//+
Line(10) = {69, 130};
//+
Line(11) = {128, 131};
//+
Line(12) = {128, 132};
//+
Line(13) = {128, 135};
//+
Split Curve {1} Point {69, 59};
//+
Split Curve {15} Point {128};
```

[Line 지정]

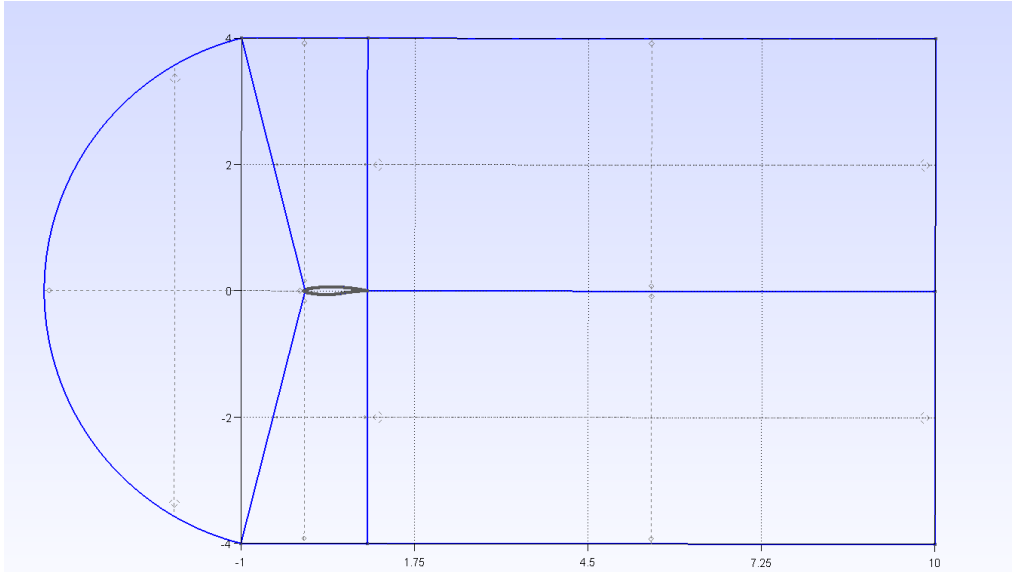


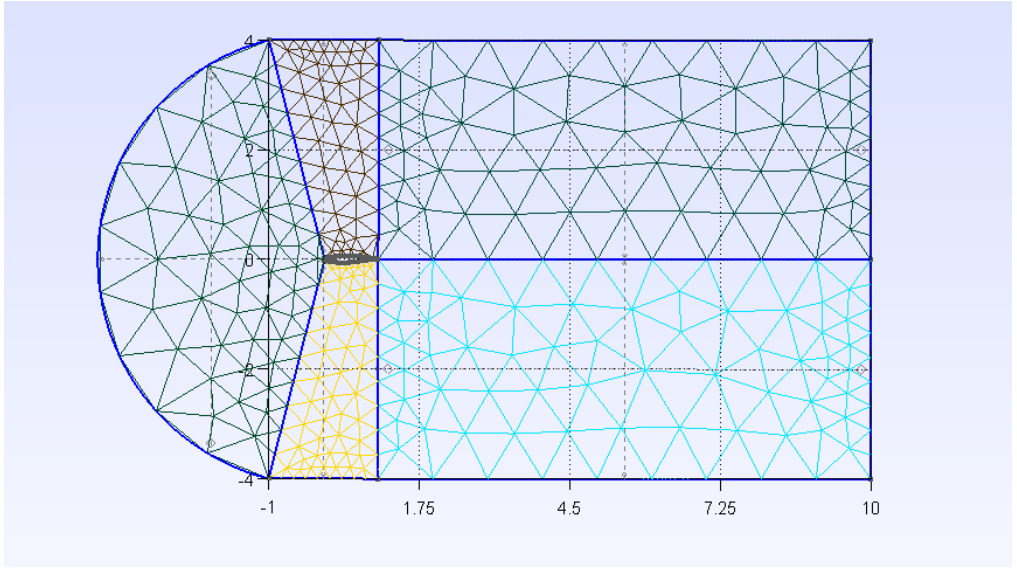
[Mesh : Point + Line + Circle Arc]

Airfoil 2822

```
//+
Transfinite Curve {2, 14} = n_inlet Using Progression 1;
//+
Transfinite Curve {9, 11, 5} = n_vertical Using Progression r_vertical;
//+
Transfinite Curve {10, 12, 6} = n_vertical Using Progression r_vertical;
//+
Transfinite Curve {3, 17} = n_airfoil Using Bump 2;
//+
Transfinite Curve {16, 7} = n_airfoil Using Bump 0.2;
//+
Transfinite Curve {4, 13, 8} = n_wake Using Progression r_wake;
//+
Curve Loop(1) = {2, -9, 14, 10};
//+
Plane Surface(1) = {1};
//+
Curve Loop(2) = {9, 3, -11, 17};
//+
Plane Surface(2) = {2};
//+
Curve Loop(3) = {11, 4, -5, -13};
//+
Plane Surface(3) = {3};
//+
Curve Loop(4) = {10, 7, -12, -16};
//+
Plane Surface(4) = {4};
//+
Curve Loop(5) = {12, 8, -6, -13};
//+
Plane Surface(5) = {5};
```

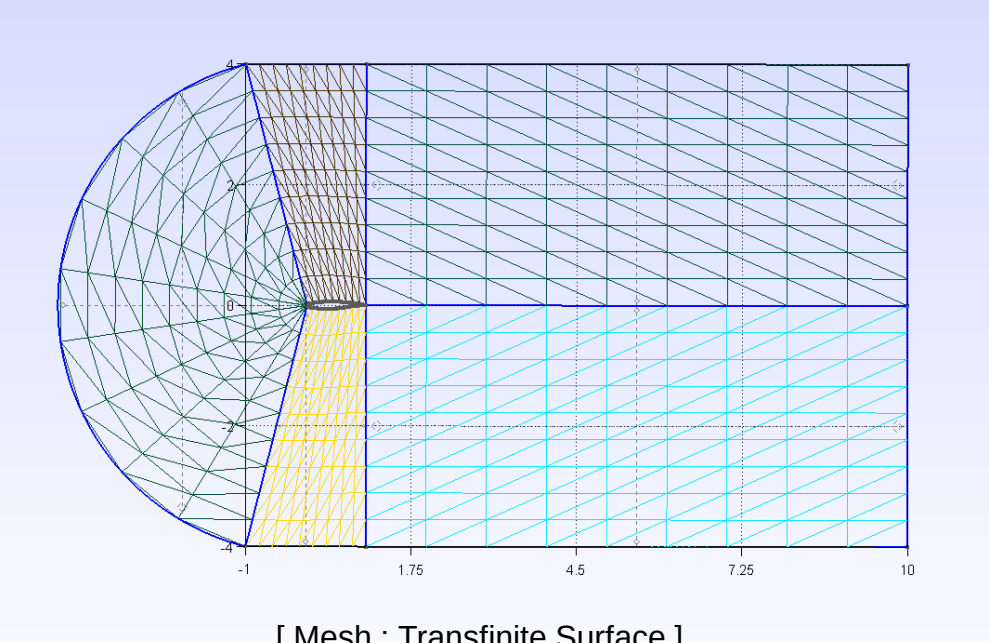
[Transfinite Curve + Plane Surface 범위 지정]



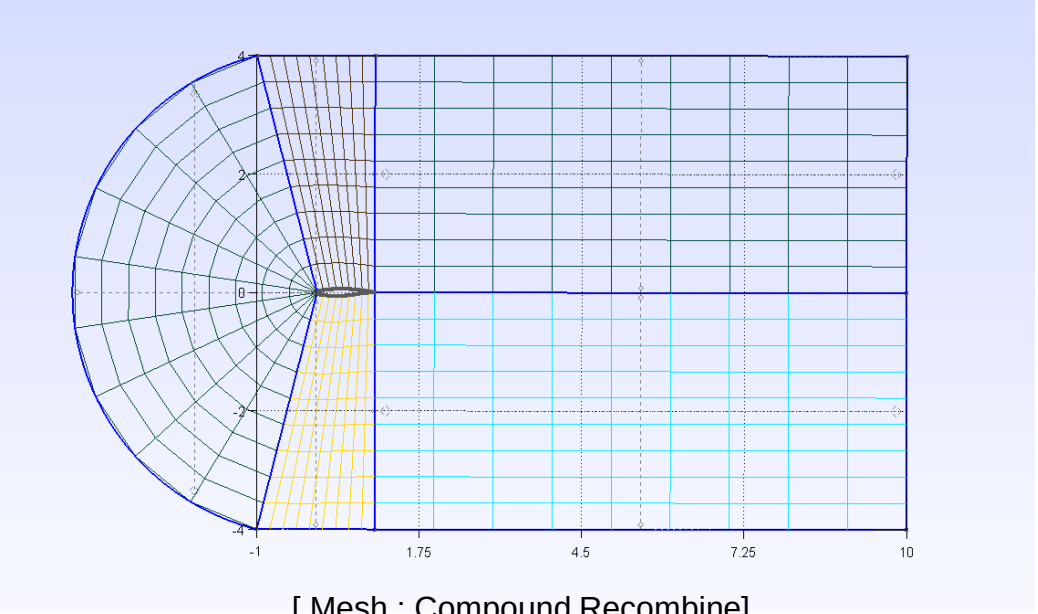


[Mesh : mesh 범위 및 격자 생성]

Airfoil 2822



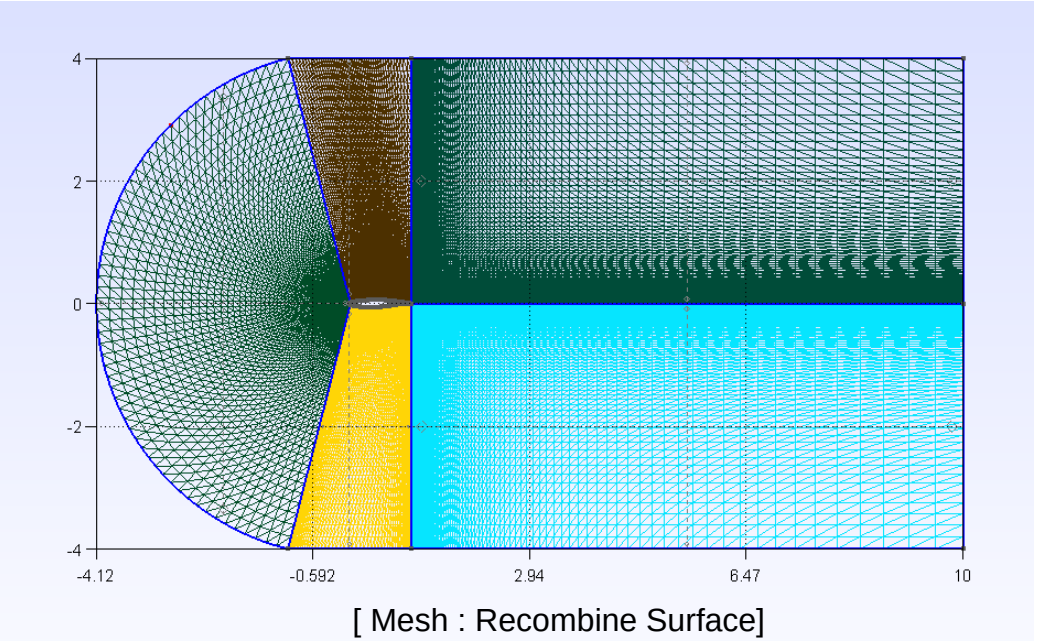
[Mesh : Transfinite Surface]



[Mesh : Compound Recombine]

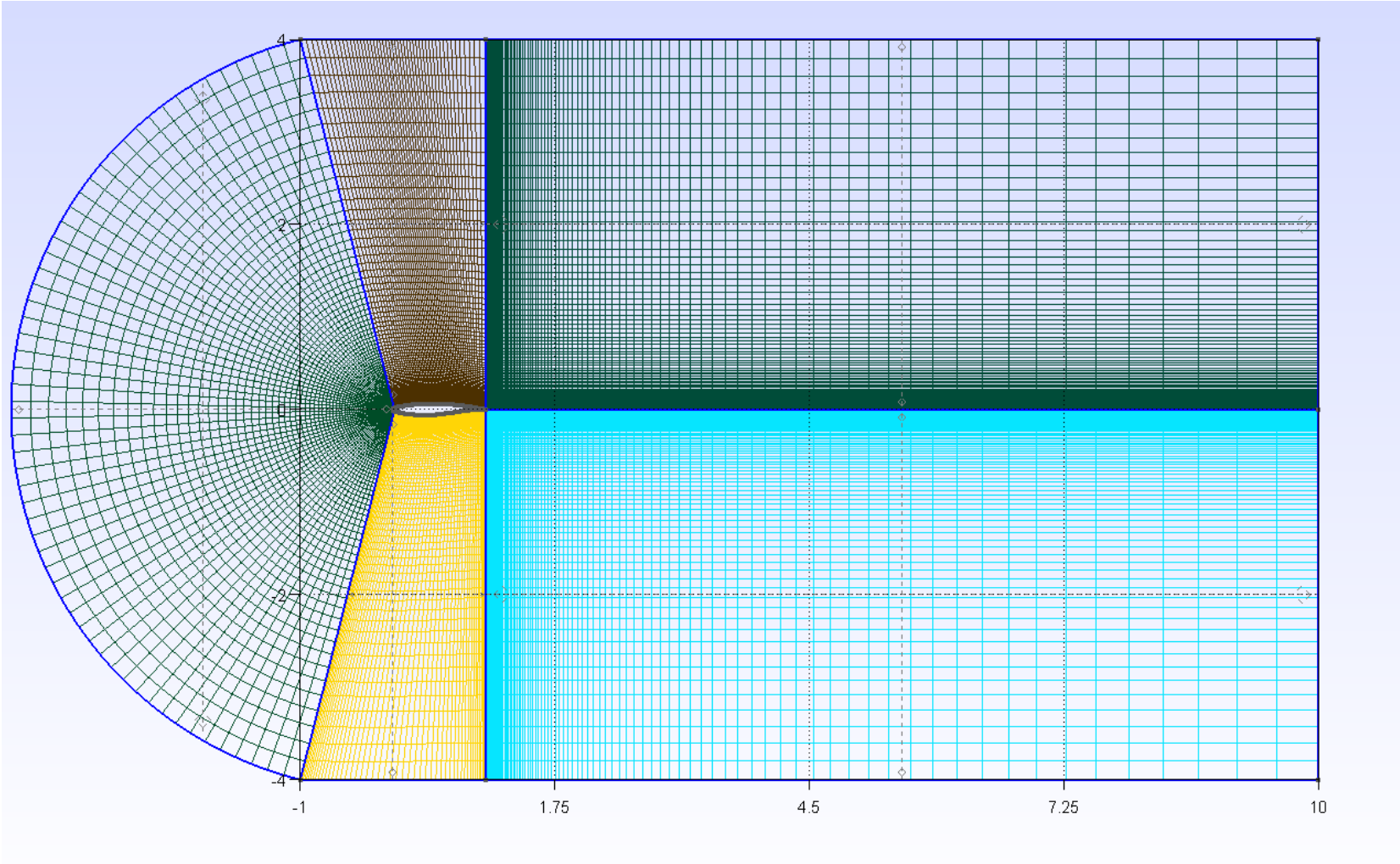
```
//+
Plane Surface(5) = {5};
//+
Transfinite Surface {1};
//+
Transfinite Surface {2};
//+
Transfinite Surface {3};
//+
Transfinite Surface {5};
//+
Transfinite Surface {4};
//+
Recombine Surface {1, 2, 3, 5, 4};
//+
Physical Curve("farfield", 18) = {2, 3, 4, 5, 6, 8, 7};
//+
Physical Curve("airfoil", 19) = {17, 14, 16};
```

```
ymax = 4;
xmax = 10;
n_inlet = 60;
n_vertical = 90;
r_vertical = 1/0.95;
n_airfoil = 50;
n_wake = 100;
r_wake = 1/0.95;
```



[Mesh : Recombine Surface]

Airfoil 2822



[Mesh 생성 결과]

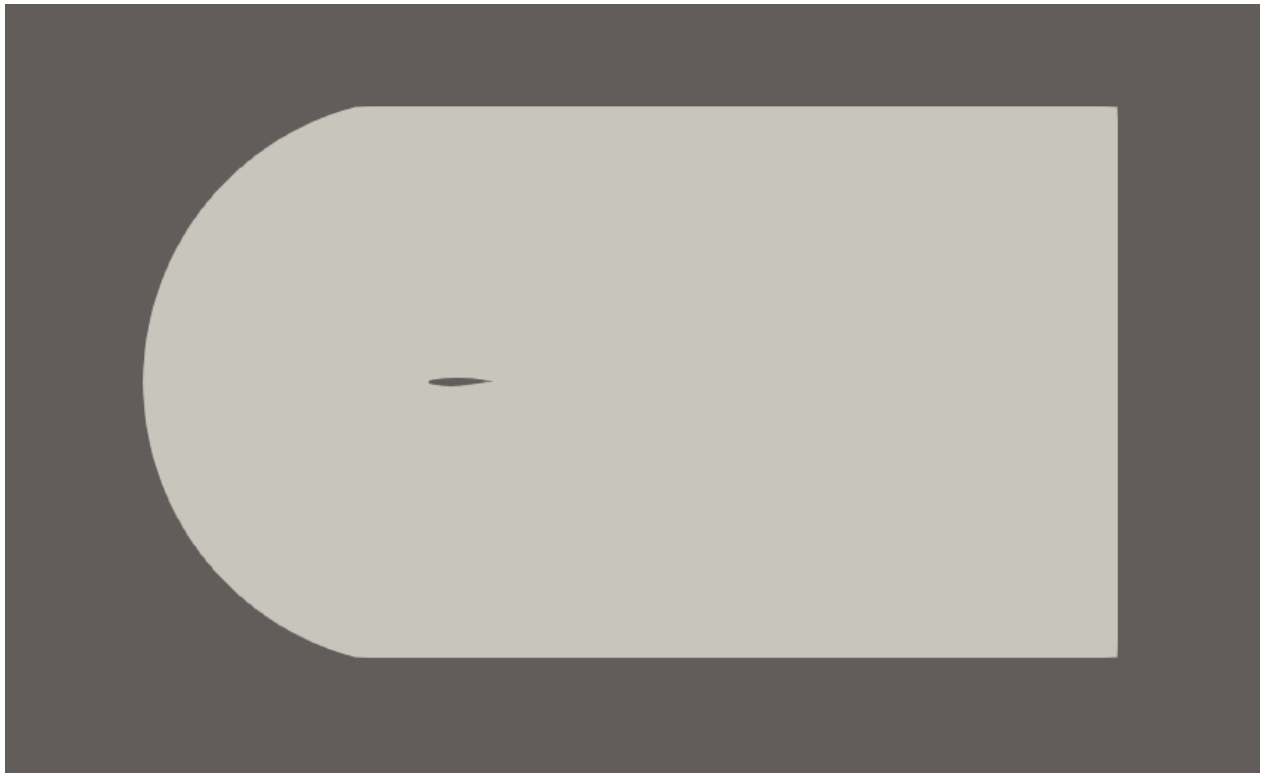
Airfoil 2822

```
% ------------------- COMPRESSIBLE FREE-STREAM DEFINITION --------------------%
%
% Mach number (non-dimensional, based on the free-stream values)
MACH_NUMBER= 0.3
%
% Angle of attack (degrees, only for compressible flows)
AOA= 3.06
```

[Turb_airfoil 2822]

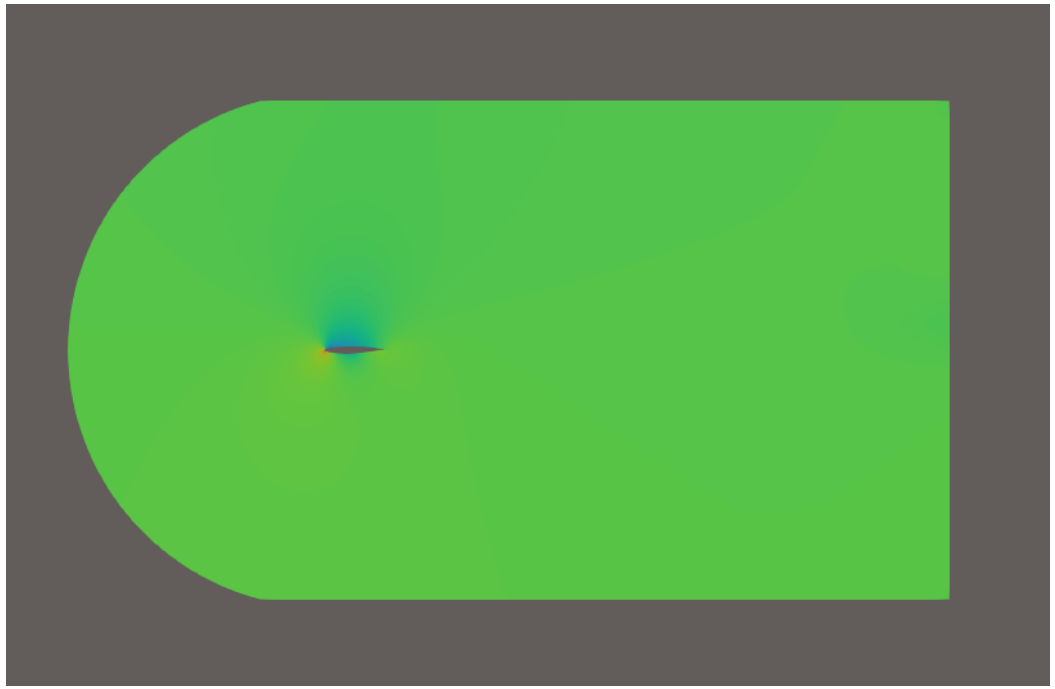
```
|         370|  1.0010e-01|   -8.863641|   -9.861363|    0.362293|    0.016721|
|         371|  1.0011e-01|   -8.873928|   -9.875192|    0.362291|    0.016721|
|         372|  1.0012e-01|   -8.884226|   -9.889018|    0.362289|    0.016721|
|         373|  1.0011e-01|   -8.894538|   -9.902837|    0.362287|    0.016721|
|         374|  1.0011e-01|   -8.904865|   -9.916650|    0.362285|    0.016721|
|         375|  1.0010e-01|   -8.915208|   -9.930453|    0.362283|    0.016721|
|         376|  1.0009e-01|   -8.925563|   -9.944248|    0.362282|    0.016721|
|         377|  1.0008e-01|   -8.935931|   -9.958032|    0.362280|    0.016721|
|         378|  1.0008e-01|   -8.946310|   -9.971806|    0.362278|    0.016721|
|         379|  1.0010e-01|   -8.956699|   -9.985570|    0.362277|    0.016721|
|         380|  1.0009e-01|   -8.967097|   -9.999324|    0.362275|    0.016721|
|         381|  1.0008e-01|   -8.977502|  -10.013069|    0.362274|    0.016721|

------------------------------ Solver Exit -------------------------------
All convergence criteria satisfied.
+-----------------------------------------------------------------------+
|      Convergence Field     |     Value    |   Criterion  | Converged |
+-----------------------------------------------------------------------+
|                Cauchy[CD]|   9.85695e-07|       < 1e-06|        Yes|
+-----------------------------------------------------------------------+
-------------------------------------------------------------------------
+-----------------------------------------------------------------------+
|       File Writing Summary       |             Filename               |
+-----------------------------------------------------------------------+
|SU2 binary restart                |restart_flow.dat                    |
|Paraview                          |flow.vtu                            |
|Paraview surface                  |surface_flow.vtu                    |
+-----------------------------------------------------------------------+

------------------------- Finalizing Solver -------------------------
Deleted CNumerics container.
Deleted CIntegration container.
Deleted CSolver container.
Deleted CIteration container.
Deleted CInterface container.
Deleted CGeometry container.
Deleted CFreeFormDefBox class.
Deleted CSurfaceMovement class.
Deleted CVolumetricMovement class.
Deleted CConfig container.
Deleted nInst container.
Deleted COutput class.
-------------------------------------------------------------------------

------------------------ Exit Success (SU2_CFD) ------------------------
```

[CMD 실행 결과]

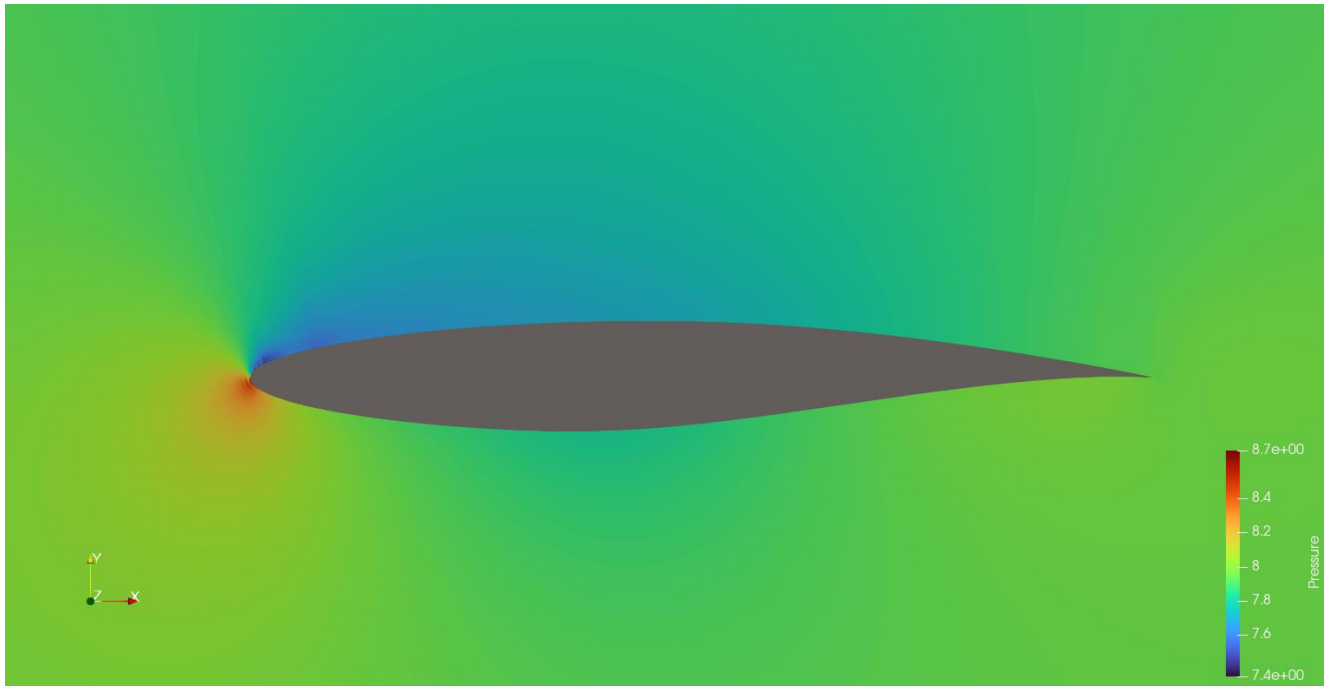


[ParaView : mesh 생성 결과]

Airfoil 2822



[Pressure 실행]



[Airfoil : Pressure 결과]