```
/*--------------------------------*- C++ -*----------------------------------*\
| =========                 |                                                 |
| \\      /  F ield         | OpenFOAM: The Open Source CFD Toolbox           |
|  \\    /   O peration     | Version:  1.5                                   |
|   \\  /    A nd           | Web:      http://www.OpenFOAM.org               |
|    \\/     M anipulation  |                                                 |
\*---------------------------------------------------------------------------*/
FoamFile
{
    version     2.0;
    format      ascii;
    class       dictionary;
    object      blockMeshDict;
}
// * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * //
convertToMeters 1;

//  The numbers in () indicates the vertex number on the rear face.
//   (36)                (37)         (27)          (26)
//       17---------------18-----------8-------------7----------------------6(25)
// I     |                 |           |             |                      |      O
// N     |                 |           |             |                      |      U
// L     |                 |           |             |                      |      T
// E     |                 |          9(28)          |                      |      L
// T     |                 |           |             |                      |      E
//   (33)14------------(34)15          |            4(23)-------------------3(22)  T
//       |                /  \         |           /  \                     |
//       |               /    \       10(29)     /     \                    |
//       |              /      \   ,  ' ' .    /        \                   |
//       |             /     (35)16         5'(24)       \                  |
//       |            /         /           %             \                 |
//       |           /         %     CYL     :              \               |
//   (32)13--------12---------11              0-------------1---------------2 -->X
//                (31)       (30)           (19)          (20)            (21)
//                       SYMMETRY PLANE
//
// Note that the geometry has been split into the most optimum shape to generate
// "block-structured" mesh. This is what one does while using "block meshing" in
// ICEM CFD though one need not bother to calculate the exact coordinates & the
// the operation is much more GUI-based than mathematics and trigonometric based.

vertices         // 'vertices' is a dictionary
(
    ( 0.5       0.0      -0.5)          //Vertex-0
    ( 1.0       0.0      -0.5)          //Vertex-1
    ( 2.0       0.0      -0.5)          //Vertex-2
    ( 2.0       0.707107 -0.5)          //Vertex-3 - Y3=1.0*sin(45)=1.0/SQRT(2)
    ( 0.707107  0.707107 -0.5)          //Vertex-4
    ( 0.353553  0.353553 -0.5)          //Vertex-5 - Y5=0.5*sin(45)=0.5/SQRT(2)
    ( 2.0       2.0      -0.5)          //Vertex-6
    ( 0.707107  2.0      -0.5)          //Vertex-7
    ( 0.0       2.0      -0.5)          //Vertex-8
    ( 0.0       1.0      -0.5)          //Vertex-9
    ( 0.0       0.5      -0.5)          //Vertex-10
    (-0.5       0.0      -0.5)          //Vertex-11
    (-1.0       0.0      -0.5)          //Vertex-12
    (-2.0       0.0      -0.5)          //Vertex-13
    (-2.0       0.707107 -0.5)          //Vertex-14
    (-0.707107  0.707107 -0.5)          //Vertex-15
```

```
    (-0.353553  0.353553 -0.5)          //Vertex-16
    (-2.0       2.0      -0.5)          //Vertex-17
    (-0.707107  2.0      -0.5)          //Vertex-18
    ( 0.5       0.0       0.5)          //Vertex-19 <- Vertex-0
    ( 1.0       0.0       0.5)          //Vertex-20 <- Vertex-1
    ( 2.0       0.0       0.5)          //Vertex-21 <- Vertex-2
    ( 2.0       0.707107  0.5)          //Vertex-22 <- Vertex-3
    ( 0.707107  0.707107  0.5)          //Vertex-23 <- Vertex-4
    ( 0.353553  0.353553  0.5)          //Vertex-24 <- Vertex-5
    ( 2.0       2.0       0.5)          //Vertex-25 <- Vertex-6
    ( 0.707107  2.0       0.5)          //Vertex-26 <- Vertex-7
    ( 0.0       2.0       0.5)          //Vertex-27 <- Vertex-8
    ( 0.0       1.0       0.5)          //Vertex-28 <- Vertex-9
    ( 0.0       0.5       0.5)          //Vertex-29 <- Vertex-10
    (-0.5       0.0       0.5)          //Vertex-30 <- Vertex-11
    (-1.0       0.0       0.5)          //Vertex-31 <- Vertex-12
    (-2.0       0.0       0.5)          //Vertex-32 <- Vertex-13
    (-2.0       0.707107  0.5)          //Vertex-33 <- Vertex-14
    (-0.707107  0.707107  0.5)          //Vertex-34 <- Vertex-15
    (-0.353553  0.353553  0.5)          //Vertex-35 <- Vertex-16
    (-2.0       2.0       0.5)          //Vertex-36 <- Vertex-17
    (-0.707107  2.0       0.5)          //Vertex-37 <- Vertex-18
);

blocks
(
    hex (5  4  9  10 24 23 28 29)
       (10 10 1)
       // specifies number of cells in x-, y- and z-direction
       simpleGrading (1 1 1)
       // Ratio of last and first cell sizes in the 3 directions
    hex (0  1  4  5  19 20 23 24) (10 10 1) simpleGrading (1 1 1)
    hex (1  2  3  4  20 21 22 23) (20 10 1) simpleGrading (1 1 1)
    hex (4  3  6  7  23 22 25 26) (20 20 1) simpleGrading (1 1 1)
    hex (9  4  7  8  28 23 26 27) (10 20 1) simpleGrading (1 1 1)
    hex (15 16 10 9  34 35 29 28) (10 10 1) simpleGrading (1 1 1)
    hex (12 11 16 15 31 30 35 34) (10 10 1) simpleGrading (1 1 1)
    hex (13 12 15 14 32 31 34 33) (20 10 1) simpleGrading (1 1 1)
    hex (14 15 18 17 33 34 37 36) (20 20 1) simpleGrading (1 1 1)
    hex (15 9  8  18 34 28 27 37) (10 20 1) simpleGrading (1 1 1)
);

edges
(
    arc 0 5   (0.469846  0.171010  -0.5)
    arc 5 10  (0.171010  0.469846  -0.5)
    arc 1 4   (0.939693  0.342020  -0.5)
    arc 4 9   (0.342020  0.939693  -0.5)
    arc 19 24 (0.469846  0.171010   0.5)
    arc 24 29 (0.171010  0.469846   0.5)
    arc 20 23 (0.939693  0.342020   0.5)
    arc 23 28 (0.342020  0.939693   0.5)
    arc 11 16 (-0.46984  0.171010  -0.5)
    arc 16 10 (-0.17101  0.469846  -0.5)
    arc 12 15 (-0.93969  0.342020  -0.5)
    arc 15 9  (-0.34202  0.939693  -0.5)
    arc 30 35 (-0.46985  0.171010   0.5)
    arc 35 29 (-0.17101  0.469846   0.5)
    arc 31 34 (-0.939693 0.34202    0.5)
```

```
    arc 34 28 (-0.34202  0.939693   0.5)
);

patches
(
    symmetryPlane down
    (
        (0  1  20 19)
        (1  2  21 20)
        (12 11 30 31)
        (13 12 31 32)
    )
    patch right
    (
        (2 3 22 21)
        (3 6 25 22)
    )
    symmetryPlane up
    (
        (7  8  27 26)
        (6  7  26 25)
        (8  18 37 27)
        (18 17 36 37)
    )
    patch left
    (
        (14 13 32 33)
        (17 14 33 36)
    )
    symmetryPlane cylinder
    (
        (10 5  24 29)
        (5  0  19 24)
        (16 10 29 35)
        (11 16 35 30)
    )
);

mergePatchPairs
(
);

// ************************************************************************* //
```