```
index: 1
roh-top boundary:
Row      Column 1
50         3.0049999999999986
roh-central rows:
Row      Column 0
49         3.029999999999998
50         3.029999999999998
Row      Column 1
49         3.0049999999999986
50         3.0049999999999986
Row      Column 101000
49         2.999179062811748
50         2.999179062811748
Row      Column 101001
49         3.00166670819479
50         3.00166670819479
roh-bottom boundary:
Row      Column 101001
100        3.0016666928140032
```

```
index: 1
u_avg-top boundary:
Row      column 1 (all inner elements)
50             [0.0016638935108152916, 0.0]
u_avg-central rows:
Row      column 0 (all inner elements)
49             [0.0, 0.0]
50             [0.0, 0.0]
Row      column 1 (all inner elements)
49             [0.0016638935108152916, 0.0]
50             [0.0016638935108152916, 0.0]
Row      column 101000 (all inner elements)
49             [0.00027372063189887733, 0.0]
50             [0.00027372063189887733, 0.0]
Row      column 101001 (all inner elements)
49             [-0.001665741231812829, 0.0]
50             [-0.001665741231812829, 0.0]
u_avg-bottom boundary:
Row      column 101001 (all inner elements)
100            [-0.0011104941602321492, 0.0]
```

```
index: 1
collision_lattice-top boundary:
Row     column 1 (all inner elements)
50          [1.3370093054785228, 0.3404258334873974, 0.3342523263696307, 0.325981389042953, 0.3342523263696307, 0.08510645837184935, 0.08149534726073825, 0.08149534726073825, 0.085
10645837184935]
collision_lattice-central rows:
Row     column 0 (all inner elements)
49          [1.346666666666658, 0.33666666666666645, 0.33666666666666645, 0.33666666666666645, 0.33666666666666645, 0.08416666666666661, 0.08416666666666661, 0.08416666666666661,
0.08416666666666661]
50          [1.346666666666658, 0.33666666666666645, 0.33666666666666645, 0.33666666666666645, 0.33666666666666645, 0.08416666666666661, 0.08416666666666661, 0.08416666666666661,
0.08416666666666661]
Row     column 1 (all inner elements)
49          [1.3370093054785228, 0.3404258334873974, 0.3342523263696307, 0.325981389042953, 0.3342523263696307, 0.08510645837184935, 0.08149534726073825, 0.08149534726073825, 0.085
10645837184935]
50          [1.3370093054785228, 0.3404258334873974, 0.3342523263696307, 0.325981389042953, 0.3342523263696307, 0.08510645837184935, 0.08149534726073825, 0.08149534726073825, 0.085
10645837184935]
Row     column 101000 (all inner elements)
49          [1.3327244826875864, 0.33455103462482566, 0.3331811206718966, 0.3321794383032124, 0.3331811206718966, 0.08363775865620642, 0.0830448595758031, 0.0830448595758031, 0.083
63775865620642]
50          [1.3327244826875864, 0.33455103462482566, 0.3331811206718966, 0.3321794383032124, 0.3331811206718966, 0.08363775865620642, 0.0830448595758031, 0.0830448595758031, 0.083
63775865620642]
Row     column 101001 (all inner elements)
49          [1.3360216326668146, 0.32536417437342907, 0.33400540816670365, 0.3398086188178733, 0.33400540816670365, 0.08134104359335727, 0.08495215470446832, 0.08495215470446832, 0
.08134104359335727]
50          [1.3360216326668146, 0.32536417437342907, 0.33400540816670365, 0.3398086188178733, 0.33400540816670365, 0.08134104359335727, 0.08495215470446832, 0.08495215470446832, 0
.08134104359335727]
collision_lattice-bottom boundary:
Row     column 101001 (all inner elements)
100         [1.3360370550573586, 0.3281111022431911, 0.33400926120087515, 0.33699999113208, 0.33400926120087515, 0.08202777556079778, 0.08424999778302, 0.08480555333857555, 0.08147
222000524224]
Simulation Execution-> TO TAL_TIME:0.0025; t:6.6666666666666675e-06; %:0.2666666666666667
```

```
index: 419
roh-top boundary:
Row        Column 1
50         3.0094145770826266
roh-central rows:
Row        Column 0
49         3.0300000649798093
50         3.030000064978379
Row        Column 1
49         3.009414592570193
50         3.0094145770826266
Row        Column 101000
49         3.003414599500301
50         3.0034146020436996
Row        Column 101001
49         3.0015484968042747
50         3.0015484446713963
roh-bottom boundary:
Row        Column 101001
100        3.0029482160238534
```

```
index: 419
u_avg-top boundary:
Row        column 1 (all inner elements)
50                 [0.001484882847669991, -9.222915256340521e-18]
u_avg-central rows:
Row        column 0 (all inner elements)
49                 [0.00053027542334231, -4.6413821689011144e-09]
50                 [0.0005302693881872469, 0.0]
Row        column 1 (all inner elements)
49                 [0.0014848730538621665, -8.884674307027482e-09]
50                 [0.001484882847669991, -9.222915256340521e-18]
Row        column 101000 (all inner elements)
49                 [0.0005211268775213069, -5.76028795809938e-10]
50                 [0.000521125710358237, -4.620670019507528e-18]
Row        column 101001 (all inner elements)
49                 [-0.0009478695554188682, 2.1324325104134347e-08]
50                 [-0.0009478479049906737, -1.849417134339642e-17]
u_avg-bottom boundary:
Row        column 101001 (all inner elements)
100                [-0.0007947695467736726, 0.0]
```

```
index: 419
collision_lattice-top boundary:
Row        column 1 (all inner elements)
50                 [1.3402849761712823, 0.3405901788584, 0.33507124404282046, 0.3276732959834168, 0.33507124404282057, 0.08431758525896008, 0.08109399916325594, 0.08109399916325594, 0.0843175852589601]
collision_lattice-central rows:
Row        column 0 (all inner elements)
49                 [1.347675624856567, 0.3395939292867969, 0.33691888285600247, 0.3349447313733903, 0.33691892957227687, 0.08406851662282525, 0.08291184987092692, 0.08291186446316645, 0.08406851625566056]
50                 [1.3476756187475896, 0.33959389723350516, 0.336918904686974, 0.3349447600934691, 0.336918904686974, 0.08406851487249645, 0.08291186483518376, 0.08291186483518376, 0.08406851487249645]
Row        column 1 (all inner elements)
49                 [1.340284987352041, 0.3405901348087464, 0.335071202421022, 0.3276733473525671, 0.3350712915465836, 0.0843175654654447, 0.08109400084547114, 0.08109400818621741, 0.08431758486236696]
50                 [1.3402849761712823, 0.3405901788584, 0.33507124404282046, 0.3276732959834168, 0.33507124404282057, 0.08431758525896008, 0.08109399916325594, 0.08109399916325594, 0.0843175852589601]
Row        column 101000 (all inner elements)
49                 [1.3358599474732249, 0.336579704344090373, 0.33396498398489, 0.3320506170319681, 0.33396498975173444, 0.08331496548149456, 0.08218832946461573, 0.08218832984468681, 0.08331496683147678]
50                 [1.33585994369418, 0.3365796989502055, 0.3339649873423545, 0.332050621232583, 0.3339649873423545, 0.08331496496864702, 0.082188330814383, 0.082188330814383, 0.083314964996864699]
Row        column 101001 (all inner elements)
49                 [1.33726086003313898, 0.328896276344331, 0.3343153251384636, 0.3371079057926032, 0.3343151071838085, 0.08139413609782886, 0.08345263047141507, 0.0834526239563198, 0.08139408320816388]
50                 [1.33726081723360183, 0.32889637425887147, 0.3343152054005479, 0.3371077852984956, 0.3343152054005481, 0.08139413373324875, 0.08345261959095776, 0.08345261959095783, 0.0813941337332488]
collision_lattice-bottom boundary:
Row        column 101001 (all inner elements)
100                [1.3376583447090296, 0.3299141919918371, 0.33461517008539765, 0.3362785966440677, 0.33461517008539765, 0.0816110440045248, 0.08333655359982706, 0.08359992049838665, 0.0813476771059653]
```

```
index: 749 ------------------------------------------------


index: 749
roh-top boundary:
Row     Column 1
50      3.011646166396876
roh-central rows:
Row     Column 0
49      3.0300000002138052
50      3.0300000002138057
Row     Column 1
49      3.011646166392144
50      3.011646166396876
Row     Column 101000
49      3.0056616413711503
50      3.0056616413767983
Row     Column 101001
49      3.0019550802427752
50      3.001955080167778
roh-bottom boundary:

Row     Column 101001
100     3.0037964500367225
```

```
index: 749
u_avg-top boundary:
Row     column 1 (all inner elements)
50              [0.0006747394499240862, -9.216081200148288e-18]
u_avg-central rows:
Row     column 0 (all inner elements)
49              [-3.1744222294646876e-05, -1.1892989342778425e-12]
50              [-3.174422301894831e-05, -9.160255978109042e-18]
Row     column 1 (all inner elements)
49              [0.00067473944966082, -5.530938971465684e-13]
50              [0.0006747394499240862, -9.216081200148288e-18]
Row     column 101000 (all inner elements)
49              [-3.124231601529059e-05, -1.4839130688560795e-12]
50              [-3.1242317384767295e-05, 0.0]
Row     column 101001 (all inner elements)
49              [-0.0013829113463449721, 1.9399949085280963e-11]
50              [-0.001382911315808479, 0.0]
u_avg-bottom boundary:
Row     column 101001 (all inner elements)
100             [-0.0007305827153290355, 0.0]
```

```
index: 749
collision_lattice-top boundary:
Row     column 1 (all inner elements)
50              [1.341955552497293, 0.337083631239691, 0.33548888821243233, 0.33211237749920036, 0.33548888821243233, 0.08334295155290769, 0.08142574605493402, 0.08142574605493404, 0.0833429515529077]
collision_lattice-central rows:
Row     column 0 (all inner elements)
49              [1.348344180047132, 0.3369262664424690, 0.33708604500599143, 0.33810332361698103, 0.3370860450179653, 0.08330361035220654, 0.08292348258709868, 0.08292348258615038, 0.083303610356796337]
50              [1.34834418005502662, 0.336926266439412, 0.33708604501256645, 0.33810332362248774, 0.3370860450125656, 0.08330361035277076, 0.0829234825836693, 0.0829234825836694, 0.0833036103527707]
Row     column 1 (all inner elements)
49              [1.341955552846277, 0.337083631237592, 0.3354888882087807, 0.33211237749964356, 0.33548888821433304, 0.08334295155412183, 0.08142574605432244, 0.08142574605707922, 0.08334295155303074]
50              [1.341955552497293, 0.337083631239691, 0.33548888821243233, 0.33211237749920036, 0.33548888821243233, 0.08334295155290769, 0.08142574605493402, 0.08142574605493404, 0.0833429515529077]
Row     column 101000 (all inner elements)
49              [1.337527131977642, 0.3342252986128504, 0.33438178298685745, 0.3353957657615606, 0.33438178300172455, 0.08262836839444536, 0.08224659312211244, 0.08224659312246957, 0.08262836839854835]
50              [1.3375271319813467, 0.33422529860752, 0.33438178299533666, 0.3353957657698153, 0.33438178299533666, 0.08262836839478829, 0.08224659312246753, 0.08224659312246753, 0.08262836839478829]
Row     column 101001 (all inner elements)
49              [1.3382131129178434, 0.32681459612997117, 0.3345532783382811, 0.33970682794577767, 0.33455327813274843, 0.08077569279987987, 0.0833243586404167, 0.0833243586208365, 0.08077569275138195]
50              [1.338213112645371, 0.32681459626270868, 0.3345532782157795, 0.339706827790912, 0.3345532782157795, 0.08077569280985729, 0.0833243586286615, 0.0833243586286615, 0.08077569280985729]
collision_lattice-bottom boundary:
Row     column 101001 (all inner elements)
100             [1.338543063157151, 0.33038953188963244, 0.3348931616436007, 0.3362415899343351, 0.334893161636007, 0.08138091548053593, 0.08304908000119941, 0.08320968361950552, 0.0812203186222982]
Simulation Execution-> TO TAL_TIME:0.0025; t:0.002500000000000012; %:100.00000000000048
```