

# CSE 5441: Program 1 Report

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Output for the following files

### 1. Input file testgrid\_1

```
time ./a.out 0.1 0.1 < /class/cse5441/testgrid_1
```

```
*****
```

Dissipation converged in 52 iterations

with max DSV = 118.918450 and min DSV = 107.278672

Affect rate = 0.100000 , epsilon = 0.100000

elapsed convergence loop time(clock) : 0

elapsed convergence loop time(time) : 0

elapsed convergence loop time (chrono): 14.000000

```
*****
```

```
real 0m0.002s
```

```
user 0m0.001s
```

```
sys 0m0.000s
```

### 2. Input file testgrid\_2

```
$ time ./a.out 0.1 0.1 < /class/cse5441/testgrid_2
```

```
*****
```

Dissipation converged in 245 iterations

with max DSV = 55.835885 and min DSV = 50.266851

Affect rate = 0.100000 , epsilon = 0.100000

elapsed convergence loop time(clock) : 0

elapsed convergence loop time(time) : 0

elapsed convergence loop time (chrono): 265.000000

```
*****
```

```
real 0m0.021s
```

```
user 0m0.000s
```

```
sys 0m0.001s
```

### 3. Input file testgrid\_50\_78

time ./a.out 0.1 0.1 < /class/cse5441/testgrid\_50\_78

\*\*\*\*\*

Dissipation converged in 1508 iterations

with max DSV = 23.369508 and min DSV = 21.035843

Affect rate = 0.100000 , epsilon = 0.100000

elapsed convergence loop time(clock) : 0

elapsed convergence loop time(time) : 0

elapsed convergence loop time (chrono): 3024.000000

\*\*\*\*\*

real 0m0.017s

user 0m0.003s

sys 0m0.002s

### 4. Input file testgrid\_50\_201

time ./a.out 0.1 0.1 < /class/cse5441/testgrid\_50\_201

\*\*\*\*\*

Dissipation converged in 2286 iterations

with max DSV = 4.788754 and min DSV = 4.309887

Affect rate = 0.100000 , epsilon = 0.100000

elapsed convergence loop time(clock) : 10000

elapsed convergence loop time(time) : 0

elapsed convergence loop time (chrono): 15044.000000

\*\*\*\*\*

real 0m0.029s

user 0m0.017s

sys 0m0.000s

### 5. Input file testgrid\_200\_1166

time ./a.out 0.1 0.1 < /class/cse5441/testgrid\_200\_1166

\*\*\*\*\*

Dissipation converged in 14458 iterations

with max DSV = 0.812728 and min DSV = 0.731459

Affect rate = 0.100000 , epsilon = 0.100000

elapsed convergence loop time(clock) : 520000

elapsed convergence loop time(time) : 1

elapsed convergence loop time (chrono): 531040.000000

\*\*\*\*\*

real 0m0.553s

user 0m0.528s

sys 0m0.003s

## 6. Input file testgrid\_400\_1636

```
$ time ./a.out 0.1 0.1 < /class/cse5441/testgrid_400_1636
```

```
*****
```

```
Dissipation converged in 22280 iterations
```

```
with max DSV = 1.181786 and min DSV = 1.063610
```

```
Affect rate = 0.100000 , epsilon = 0.100000
```

```
elapsed convergence loop time(clock) : 1360000
```

```
elapsed convergence loop time(time) : 1
```

```
elapsed convergence loop time (chrono): 1367718.000000
```

```
*****
```

```
real 0m1.373s
```

```
user 0m1.369s
```

```
sys 0m0.000s
```

## 7. Input file testgrid\_400\_12206

```
$ time ./a.out 0.1 0.1 < /class/cse5441/testgrid_400_12206
```

```
*****
```

```
Dissipation converged in 75197 iterations
```

```
with max DSV = 0.086671 and min DSV = 0.078004
```

```
Affect rate = 0.100000 , epsilon = 0.100000
```

```
elapsed convergence loop time(clock) : 37270000
```

```
elapsed convergence loop time(time) : 37
```

```
elapsed convergence loop time (chrono): 37288225.000000
```

```
*****
```

```
real 0m37.309s
```

```
user 0m37.281s
```

```
sys 0m0.006s
```

## Summary of timing results

Affect rate = 0.1 and Epsilon = 0.1

Testgrid	Max DSV	Min DSV	Clock	time	Chrono	Iterations
testgrid_1	118.9184	107.27867	0	0	14	52
testgrid_2	55.83588	50.266851	0	0	265.0	245
testgrid_50_78	23.36950	21.035843	0	0	3024.0	1508
testgrid_50_201	4.788754	4.309887	10000	0	15044	2286
testgrid_200_1166	0.812728	0.731459	520000	1	531040.0	14458
testgrid_400_1636	1.181786	1.063610	1360000	1	1367718.0	22280
testgrid_400_12206	0.086671	0.078004	37270000	37	37288225.0	75197

Testgrid\_400\_12206 for different values of affect rate and epsilon

We see that for epsilon = 0.03 and affect rate = 0.03 the application successfully converges for the "testgrid\_400\_12206" test data file, while running for approximately 3 - 6 minutes.

Epsilon	Affect rate	Max DSV	Min DSV	Clock	Time	Chrono	Iteration
0.1	0.1	0.086671	0.078004	37270000	37	37288225.0	75197
0.08	0.08	0.086019	0.079137	50060000	50	50115013.000000	101983
0.06	0.06	0.085452	0.080325	74440000	74	74487320.000000	151825
0.04	0.04	0.085141	0.081735	136850000	137	136921935.00000	278494
<b>0.03</b>	<b>0.03</b>	<b>0.084946</b>	<b>0.082397</b>	<b>213830000</b>	<b>214</b>	<b>213941931.000000</b>	<b>434142</b>
0.02	0.02	0.084637	0.082944	388830000	389	388985983.000000	794818