EECS E6895 Advanced Big Data Analytics

Homework 3 (using grace day)
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Algorithm 1: Matrix multiplication

```
input matrix 1:
2.00    2.00    2.00
2.00    2.00    2.00

input matrix 2:
2.00    2.00    2.00    2.00
2.00    2.00    2.00    2.00
2.00    2.00    2.00    2.00

output matrix (CPU):
12.00   12.00   12.00   12.00
12.00   12.00   12.00   12.00
**************************************************
The total time using CPU: 0.000000 seconds
**************************************************

output matrix (using GPU):
12.00   12.00   12.00   12.00
12.00   12.00   12.00   12.00
**************************************************
The total time using GPU: 0.171000 seconds
**************************************************
```

```
number in matrix: 6000.00
**************************************************
The total time using CPU: 23.146000 seconds
**************************************************
**************************************************
The total time using GPU: 1.612000 seconds
**************************************************
```

Algorithm 2: Linear Regression

```
C:\Users\hpan4\Desktop\lr\lr>cuda-memcheck ./kernel
========= CUDA-MEMCHECK
X:
1.0000  0.0000
1.0000  1.0000
1.0000  2.0000
1.0000  3.0000
1.0000  4.0000
1.0000  5.0000

y:
0.0000  20.0000 60.0000 68.0000 77.0000 110.0000

X':
1.0000  1.0000  1.0000  1.0000  1.0000  1.0000
0.0000  1.0000  2.0000  3.0000  4.0000  5.0000

X'*X:
6.0000  15.0000
15.0000 55.0000

pinv(X'*X):
0.5238, -0.1429,
-0.1429, 0.0571,

pinv(X'*X)*X:
0.5238  0.3810  0.2381  0.0952  -0.0476 -0.1905
-0.1429 -0.0857 -0.0286 0.0286  0.0857  0.1429

the result is:
3.7619
20.8286

-----------------------------------------
The regression model is:y = 20.8286 * x + 3.7619
-----------------------------------------
========= ERROR SUMMARY: 0 errors
```