

Homework Assignment 1

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Problem 1:

a) $\gcd(31415, 14142) = \gcd(14142, 3131) = \gcd(3131, 1618) = \gcd(1618, 1513) = \gcd(1513, 105) = \gcd(105, 43) = \gcd(43, 19) = \gcd(19, 5) = \gcd(5, 4) = \underline{1}$

b) $14142 / 9 = \underline{\text{1571.33 times faster}}$

Problem 2:

a) The minimum number of divisions is 1 which occurs if m is a multiple of n .

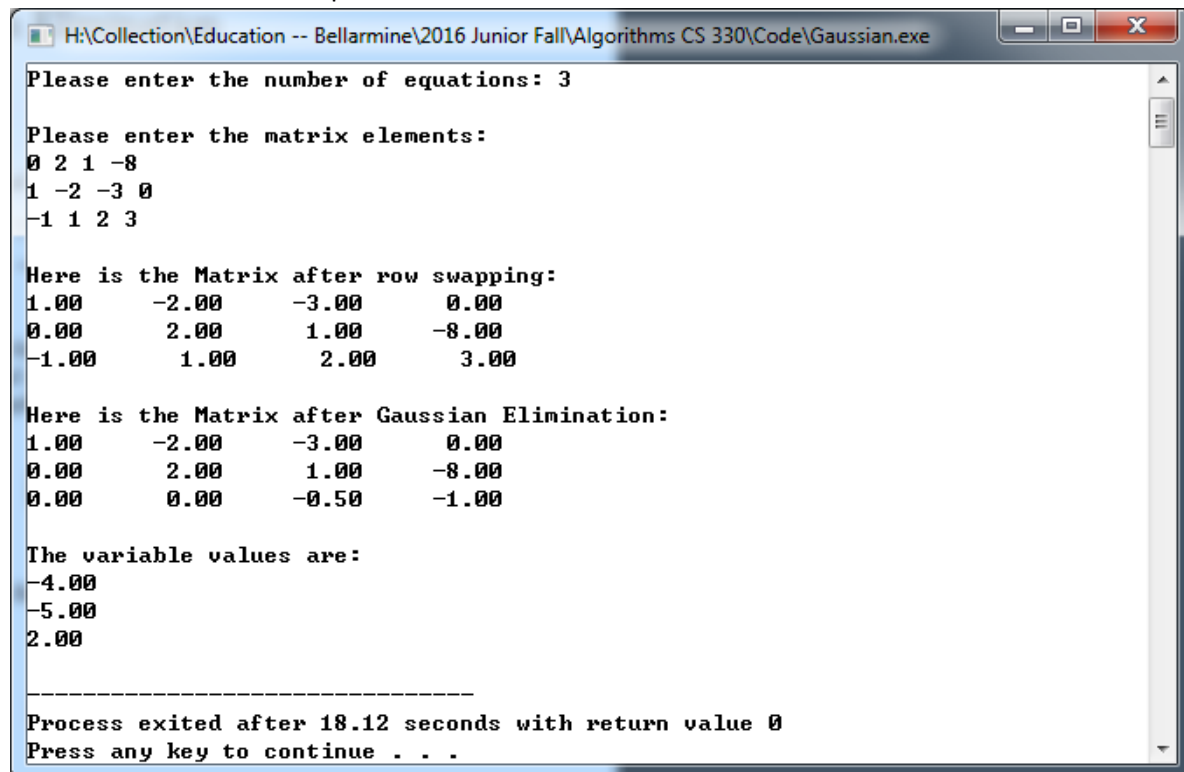
b) The maximum number of divisions is 5 where $m = 5$ and $n = 8$.

Problem 3:

a) is the solution since in b) we don't know how to solve for $\sin(A)$ and in c) we don't know how to solve for h_a .

Problem 4:

Gaussian Elimination Examples:



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H:\Collection\Education -- Bellarmine\2016 Junior Fall\Algorithms CS 330\Code\Gaussian.exe

Please enter the number of equations: 3

Please enter the matrix elements:
0 2 1 -8
1 -2 -3 0
-1 1 2 3

Here is the Matrix after row swapping:
1.00    -2.00    -3.00     0.00
0.00     2.00     1.00    -8.00
-1.00     1.00     2.00     3.00

Here is the Matrix after Gaussian Elimination:
1.00    -2.00    -3.00     0.00
0.00     2.00     1.00    -8.00
0.00     0.00    -0.50    -1.00

The variable values are:
-4.00
-5.00
2.00

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Process exited after 18.12 seconds with return value 0
Press any key to continue . . .
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H:\Collection\Education -- Bellarmine\2016 Junior Fall\Algorithms CS 330\Code\Gaussian.exe

Please enter the number of equations: 2

Please enter the matrix elements:
1 5 7
-2 -7 -5

Here is the Matrix after row swapping:
1.00      5.00      7.00
-2.00     -7.00     -5.00

Here is the Matrix after Gaussian Elimination:
1.00      5.00      7.00
0.00      3.00      9.00

The variable values are:
-8.00
3.00

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Process exited after 23.56 seconds with return value 0
Press any key to continue . . .
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H:\Collection\Education -- Bellarmine\2016 Junior Fall\Algorithms CS 330\Code\Gaussian.exe

Please enter the number of equations: 3

Please enter the matrix elements:
1 -2 -6 12
1 -4 -12 22
2 4 12 -17

Here is the Matrix after row swapping:
2.00      4.00     12.00    -17.00
1.00     -2.00     -6.00     12.00
1.00     -4.00    -12.00     22.00

Here is the Matrix after Gaussian Elimination:
2.00      4.00     12.00    -17.00
0.00     -4.00    -12.00     20.50
0.00      0.00      0.00     -0.25

The variable values are:
nan
inf
-inf

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Process exited after 19.77 seconds with return value 0
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