Data Science Math Assignment 4 (Hand-written)

1. Using matrix operations, describe the solutions for the following family of equations:

x + 2y - 3z = 5

2x + y - 3z = 13

-x + y = -8

Find the determinant of the coefficient matrix

| 1 2 -3 |

D = | 2 1 -3 | = 0

| -1 1 0 |

Find the determinant of the x matrix

| 5 2 -3 |

Dx = | 13 1 -3 | = 0

| -8 1 0 |

Find the determinant of the y matrix

| 1 5 -3 |

Dy = | 2 13 -3 | = 0

| -1 -8 0 |

Find the determinant of the z matrix

| 1 2 5 |

Dz = | 2 1 13 | = 0

| -1 1 -8 |

All of the determinants are equal to zero, the system has infinite solutions

2. Provide a solution for #1, using R functions of your choice.

A <- matrix(data=c(1, 2, -3, 2, 1, -3, -1, 1, 0), nrow=3, ncol=3, byrow=TRUE)

B <- matrix(data=c(5, 13, -8), nrow=3, ncol=1, byrow=TRUE)

round(solve(A, B), 3)

3. [4 -3] [1 4]

A = [-3 5] B = [3 -2]

[0 1 ]

[4x1-3x3 4x4+-3x-2] [-5 22]

AB = [-3x1+5x3 -3x4+5x-2] = [12 -22]

[0x1+1x3 0x4+1x-2] [3 -2]

4. Solve AB from #3 using R functions of your choice.

A <- matrix(c(4,-3,0,-3,5,1),3,2)

B <- matrix(c(1,3,4,-2),2,2)

A %\*% B