Math650 Homework 2

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Abstract

Matrix

1 Introduction

Generate a matrix and apply some operations.

2 Methods

Open R and type commands. Code see Appendix 5.

3 Results

Generate a 4 by 6 matrix X whose entries are independent and identically distributed random numbers following a N(2,4) distribution.

```
> norm_randm_list = rnorm(24, 2, 4)
> norm_random_list
 [1]  4.0030321 -0.6414714 -5.4938659  0.5669581  5.8582990  0.7107656
 [7]  5.3922975 -3.6034697  7.3891580  6.8106063  0.7573053  2.3363219
[13]  1.8553793  5.8996918  6.4083927 -8.0716747  7.0565890 -0.6418736
[19]  4.4272155  1.4212740  3.9231919  1.7940718 -2.2095192 13.1798591
> X = matrix(norm_random_list, 4,6)
> X
           [,1]       [,2]      [,3]      [,4]       [,5]      [,6]
[1,]  4.0030321  5.8582990 7.3891580  1.855379  7.0565890  3.923192
[2,] -0.6414714  0.7107656 6.8106063  5.899692 -0.6418736  1.794072
[3,] -5.4938659  5.3922975 0.7573053  6.408393  4.4272155 -2.209519
[4,]  0.5669581 -3.6034697 2.3363219 -8.071675  1.4212740 13.179859
```

Calculate column means for matrix X.

```
> apply(X, 2, mean)
[1] -0.3913367  2.0894731  4.3233479  1.5229473  3.0658012  4.1719009
```

Calculate the standard deviation of the column means.

```
> sd(apply(X, 2, mean))
[1] 1.7841
```

4 Conclusions and discussion

Deviations are pretty big and the column means are substantially away from 2. High level functions of R make things easy.

5 Appendix

```
norm_randm_list = rnorm(24, 2, 4)
X = matrix(norm_random_list, 4,6)
apply(X, 2, mean)
sd(apply(X, 2, mean))
```