Simulating Normal Distribution Data in R

Meet Data

6/21/2022

```
set.seed(1)

# sample size = 200, mean = 0, sd = 1
X_1 <- rnorm(200)

print(X_1)
```

```
##   [1] -0.626453811  0.183643324 -0.835628612  1.595280802  0.329507772
##   [6] -0.820468384  0.487429052  0.738324705  0.575781352 -0.305388387
##  [11]  1.511781168  0.389843236 -0.621240581 -2.214699887  1.124930918
##  [16] -0.044933609 -0.016190263  0.943836211  0.821221195  0.593901321
##  [21]  0.918977372  0.782136301  0.074564983 -1.989351696  0.619825748
##  [26] -0.056128740 -0.155795507 -1.470752384 -0.478150055  0.417941560
##  [31]  1.358679552 -0.102787727  0.387671612 -0.053805041 -1.377059557
##  [36] -0.414994563 -0.394289954 -0.059313397  1.100025372  0.763175748
##  [41] -0.164523596 -0.253361680  0.696963375  0.556663199 -0.688755695
##  [46] -0.707495157  0.364581962  0.768532925 -0.112346212  0.881107726
##  [51]  0.398105880 -0.612026393  0.341119691 -1.129363096  1.433023702
##  [56]  1.980399899 -0.367221476 -1.044134626  0.569719627 -0.135054604
##  [61]  2.401617761 -0.039240003  0.689739362  0.028002159 -0.743273209
##  [66]  0.188792300 -1.804958629  1.465554862  0.153253338  2.172611670
##  [71]  0.475509529 -0.709946431  0.610726353 -0.934097632 -1.253633400
##  [76]  0.291446236 -0.443291873  0.001105352  0.074341324 -0.589520946
##  [81] -0.568668733 -0.135178615  1.178086997 -1.523566800  0.593946188
##  [86]  0.332950371  1.063099837 -0.304183924  0.370018810  0.267098791
##  [91] -0.542520031  1.207867806  1.160402616  0.700213650  1.586833455
##  [96]  0.558486426 -1.276592208 -0.573265414 -1.224612615 -0.473400636
## [101] -0.620366677  0.042115873 -0.910921649  0.158028772 -0.654584644
## [106]  1.767287269  0.716707476  0.910174229  0.384185358  1.682176081
## [111] -0.635736454 -0.461644730  1.432282239 -0.650696353 -0.207380744
## [116] -0.392807929 -0.319992869 -0.279113303  0.494188331 -0.177330482
## [121] -0.505957462  1.343038825 -0.214579409 -0.179556530 -0.100190741
## [126]  0.712666307 -0.073564404 -0.037634171 -0.681660479 -0.324270272
## [131]  0.060160440 -0.588894486  0.531496193 -1.518394082  0.306557861
## [136] -1.536449824 -0.300976127 -0.528279904 -0.652094781 -0.056896778
## [141] -1.914359426  1.176583312 -1.664972436 -0.463530401 -1.115920105
## [146] -0.750819001  2.087166546  0.017395620 -1.286300530 -1.640605534
## [151]  0.450187101 -0.018559833 -0.318068375 -0.929362147 -1.487460310
## [156] -1.075192297  1.000028804 -0.621266695 -1.384426847  1.869290622
## [161]  0.425100377 -0.238647101  1.058483049  0.886422651 -0.619243048
## [166]  2.206102465 -0.255027030 -1.424494650 -0.144399602  0.207538339
```

```
## [171]  2.307978399  0.105802368  0.456998805 -0.077152935 -0.334000842
## [176] -0.034726028  0.787639606  2.075245009  1.027392439  1.207908398
## [181] -1.231323422  0.983895570  0.219924804 -1.467250029  0.521022743
## [186] -0.158754605  1.464587312 -0.766082000 -0.430211754 -0.926109497
## [191] -0.177103961  0.402011779 -0.731748173  0.830373168 -1.208082786
## [196] -1.047984413  1.441157707 -1.015847465  0.411974712 -0.381076051
```

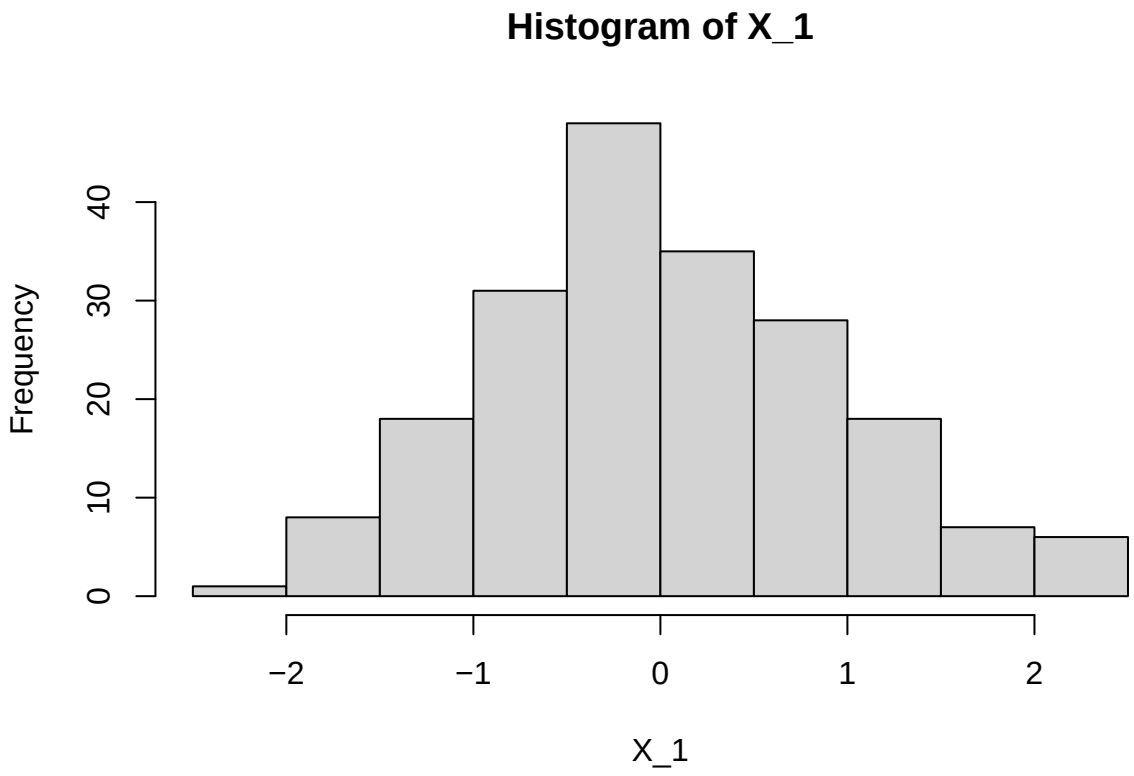
```
# calculate the mean
mean(X_1)
```

```
## [1] 0.03553965
```

```
# calculate the sd
sd(X_1)
```

```
## [1] 0.9290973
```

```
# plot the histogram of the sample
hist(X_1)
```




```
set.seed(1)

# sample size = 200, mean = 8, sd = 20
X_2 <- rnorm(200, 8, 20)
```

```
print(X_2)
```

```
##   [1]  -4.5290762  11.6728665  -8.7125722  39.9056160  14.5901554  -8.4093677
##   [7]  17.7485810  22.7664941  19.5156270   1.8922323  38.2356234  15.7968647
##  [13]  -4.4248116 -36.2939977  30.4986184   7.1013278   7.6761947  26.8767242
##  [19]  24.4244239  19.8780264  26.3795474  23.6427260   9.4912997 -31.7870339
##  [25]  20.3965150   6.8774252   4.8840899 -21.4150477  -1.5630011  16.3588312
##  [31]  35.1735910   5.9442455  15.7534322   6.9238992 -19.5411911  -0.2998913
##  [37]   0.1142009   6.8137321  30.0005074  23.2635150   4.7095281   2.9327664
##  [43]  21.9392675  19.1332640  -5.7751139  -6.1499031  15.2916392  23.3706585
##  [49]   5.7530758  25.6221545  15.9621176  -4.2405279  14.8223938 -14.5872619
##  [55]  36.6604740  47.6079980   0.6555705 -12.8826925  19.3943925   5.2989079
##  [61]  56.0323552   7.2151999  21.7947872   8.5600432  -6.8654642  11.7758460
##  [67] -28.0991726  37.3110972  11.0650668  51.4522334  17.5101906  -6.1989286
##  [73]  20.2145271 -10.6819526 -17.0726680  13.8289247  -0.8658375   8.0221070
##  [79]   9.4868265  -3.7904189  -3.3733747   5.2964277  31.5617399 -22.4713360
##  [85]  19.8789238  14.6590074  29.2619967   1.9163215  15.4003762  13.3419758
##  [91]  -2.8504006  32.1573561  31.2080523  22.0042730  39.7366691  19.1697285
##  [97] -17.5318442  -3.4653083 -16.4922523  -1.4680127  -4.4073335   8.8423175
## [103] -10.2184330  11.1605754  -5.0916929  43.3457454  22.3341495  26.2034846
## [109]  15.6837072  41.6435216  -4.7147291  -1.2328946  36.6456448  -5.0139271
## [115]   3.8523851   0.1438414   1.6001426   2.4177339  17.8837666   4.4533904
## [121]  -2.1191492  34.8607765   3.7084118   4.4088694   5.9961852  22.2533261
## [127]   6.5287119   7.2473166  -5.6332096   1.5145946   9.2032088  -3.7778897
## [133]  18.6299239 -22.3678816  14.1311572 -22.7289965   1.9804775  -2.5655981
## [139]  -5.0418956   6.8620644 -30.2871885  31.5316662 -25.2994487  -1.2706080
## [145] -14.3184021  -7.0163800  49.7433309   8.3479124 -17.7260106 -24.8121107
## [151]  17.0037420   7.6288033   1.6386325 -10.5872429 -21.7492062 -13.5038459
## [157]  28.0005761  -4.4253339 -19.6885369  45.3858124  16.5020075   3.2270580
## [163]  29.1696610  25.7284530  -4.3848610  52.1220493   2.8994594 -20.4898930
## [169]   5.1120080  12.1507668  54.1595680  10.1160474  17.1399761   6.4569413
## [175]   1.3199832   7.3054794  23.7527921  49.5049002  28.5478488  32.1581680
## [181] -16.6264684  27.6779114  12.3984961 -21.3450006  18.4204549   4.8249079
## [187]  37.2917462  -7.3216400  -0.6042351 -10.5221899   4.4579208  16.0402356
## [193]  -6.6349635  24.6074634 -16.1616557 -12.9596883  36.8231541 -12.3169493
## [199]  16.2394942   0.3784790
```

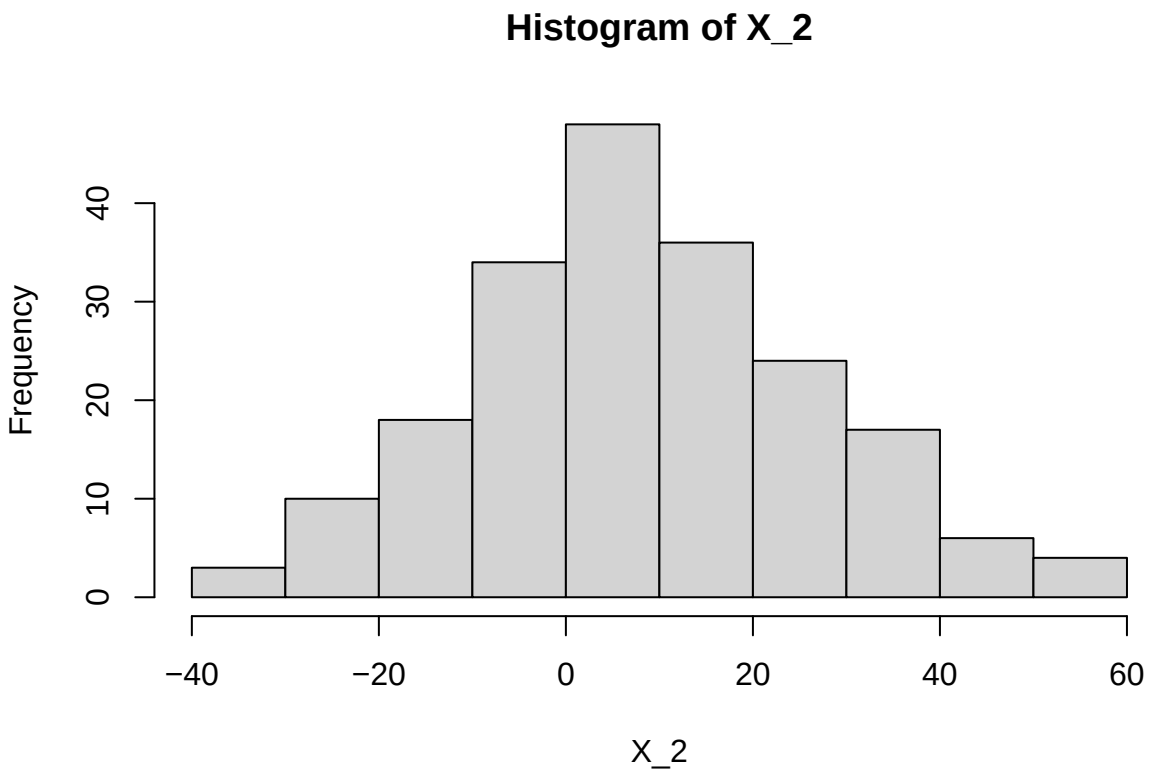
```
# calculate the mean
mean(X_2)
```

```
## [1] 8.710793
```

```
# calculate the sd
sd(X_2)
```

```
## [1] 18.58195
```

```
# plot the histogram of the sample
hist(X_2)
```


Histogram of X_2
Frequency
0
10
20
30
40
−40
−20
0
20
40
60
X_2