```
8/8 [==============================] - 0s 984us/step - loss: 1.0831
Epoch 42/200
8/8 [==============================] - 0s 928us/step - loss: 1.0795
Epoch 43/200
8/8 [==============================] - 0s 1ms/step - loss: 1.4360
Epoch 44/200
8/8 [==============================] - 0s 995us/step - loss: 1.5038
Epoch 45/200
8/8 [==============================] - 0s 1ms/step - loss: 1.8260
Epoch 46/200
8/8 [==============================] - 0s 1ms/step - loss: 1.0314
Epoch 47/200
8/8 [==============================] - 0s 750us/step - loss: 1.2797
Epoch 48/200
8/8 [==============================] - 0s 884us/step - loss: 0.9086
Epoch 49/200
8/8 [==============================] - 0s 863us/step - loss: 0.9228
Epoch 50/200
8/8 [==============================] - 0s 1ms/step - loss: 1.8341
Epoch 51/200
8/8 [==============================] - 0s 1ms/step - loss: 1.5720
Epoch 52/200
8/8 [==============================] - 0s 890us/step - loss: 2.1549
Epoch 53/200
8/8 [==============================] - 0s 1ms/step - loss: 1.8245
Epoch 54/200
8/8 [==============================] - 0s 1ms/step - loss: 2.6021
Epoch 55/200
8/8 [==============================] - 0s 960us/step - loss: 1.3209
Epoch 56/200
8/8 [==============================] - 0s 1ms/step - loss: 0.7486
Epoch 57/200
8/8 [==============================] - 0s 956us/step - loss: 1.3353
Epoch 58/200
8/8 [==============================] - 0s 1ms/step - loss: 0.4616
Epoch 59/200
8/8 [==============================] - 0s 978us/step - loss: 0.4373
Epoch 60/200
8/8 [==============================] - 0s 928us/step - loss: 0.9595
Epoch 61/200
8/8 [==============================] - 0s 1ms/step - loss: 0.5575
Epoch 62/200
8/8 [==============================] - 0s 1ms/step - loss: 0.4471
Epoch 63/200
8/8 [==============================] - 0s 847us/step - loss: 0.2390
Epoch 64/200
8/8 [==============================] - 0s 872us/step - loss: 0.2165
Epoch 65/200
8/8 [==============================] - 0s 986us/step - loss: 0.2892
Epoch 66/200
8/8 [==============================] - 0s 821us/step - loss: 0.3147
Epoch 67/200
8/8 [==============================] - 0s 998us/step - loss: 0.2142
Epoch 68/200
8/8 [==============================] - 0s 1ms/step - loss: 0.6593
Epoch 69/200
8/8 [==============================] - 0s 986us/step - loss: 0.3048
Epoch 70/200
8/8 [==============================] - 0s 831us/step - loss: 0.2954
```

```
Epoch 71/200
8/8 [==============================] - 0s 907us/step - loss: 0.2291
Epoch 72/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1565
Epoch 73/200
8/8 [==============================] - 0s 942us/step - loss: 0.1266
Epoch 74/200
8/8 [==============================] - 0s 897us/step - loss: 1.0219
Epoch 75/200
8/8 [==============================] - 0s 864us/step - loss: 0.5637
Epoch 76/200
8/8 [==============================] - 0s 1ms/step - loss: 0.4351
Epoch 77/200
8/8 [==============================] - 0s 13ms/step - loss: 0.1919
Epoch 78/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1087
Epoch 79/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1689
Epoch 80/200
8/8 [==============================] - 0s 1000us/step - loss: 0.2387
Epoch 81/200
8/8 [==============================] - 0s 1ms/step - loss: 0.3072
Epoch 82/200
8/8 [==============================] - 0s 758us/step - loss: 0.1343
Epoch 83/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1217
Epoch 84/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1504
Epoch 85/200
8/8 [==============================] - 0s 878us/step - loss: 0.1388
Epoch 86/200
8/8 [==============================] - 0s 942us/step - loss: 0.0976
Epoch 87/200
8/8 [==============================] - 0s 997us/step - loss: 0.2248
Epoch 88/200
8/8 [==============================] - 0s 966us/step - loss: 0.1702
Epoch 89/200
8/8 [==============================] - 0s 857us/step - loss: 0.1027
Epoch 90/200
8/8 [==============================] - 0s 799us/step - loss: 0.0561
Epoch 91/200
8/8 [==============================] - 0s 859us/step - loss: 0.0711
Epoch 92/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1432
Epoch 93/200
8/8 [==============================] - 0s 859us/step - loss: 0.1640
Epoch 94/200
8/8 [==============================] - 0s 967us/step - loss: 0.0499
Epoch 95/200
8/8 [==============================] - 0s 855us/step - loss: 0.0452
Epoch 96/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1807
Epoch 97/200
8/8 [==============================] - 0s 853us/step - loss: 0.0903
Epoch 98/200
8/8 [==============================] - 0s 835us/step - loss: 0.1953
Epoch 99/200
8/8 [==============================] - 0s 893us/step - loss: 0.0612
Epoch 100/200
```

```
8/8 [==============================] - 0s 973us/step - loss: 0.1040
Epoch 101/200
8/8 [==============================] - 0s 1000us/step - loss: 0.0422
Epoch 102/200
8/8 [==============================] - 0s 689us/step - loss: 0.1243
Epoch 103/200
8/8 [==============================] - 0s 0s/step - loss: 0.0582
Epoch 104/200
8/8 [==============================] - 0s 372us/step - loss: 0.0746
Epoch 105/200
8/8 [==============================] - 0s 959us/step - loss: 0.0400
Epoch 106/200
8/8 [==============================] - 0s 982us/step - loss: 0.1100
Epoch 107/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0701
Epoch 108/200
8/8 [==============================] - 0s 758us/step - loss: 0.0588
Epoch 109/200
8/8 [==============================] - 0s 890us/step - loss: 0.0671
Epoch 110/200
8/8 [==============================] - 0s 992us/step - loss: 0.0675
Epoch 111/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0945
Epoch 112/200
8/8 [==============================] - 0s 851us/step - loss: 0.1028
Epoch 113/200
8/8 [==============================] - 0s 972us/step - loss: 0.0654
Epoch 114/200
8/8 [==============================] - 0s 850us/step - loss: 0.0417
Epoch 115/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0337
Epoch 116/200
8/8 [==============================] - 0s 862us/step - loss: 0.0553
Epoch 117/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0343
Epoch 118/200
8/8 [==============================] - 0s 980us/step - loss: 0.0736
Epoch 119/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0429
Epoch 120/200
8/8 [==============================] - 0s 787us/step - loss: 0.0521
Epoch 121/200
8/8 [==============================] - 0s 987us/step - loss: 0.0330
Epoch 122/200
8/8 [==============================] - 0s 836us/step - loss: 0.0369
Epoch 123/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0260
Epoch 124/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0309
Epoch 125/200
8/8 [==============================] - 0s 863us/step - loss: 0.0333
Epoch 126/200
8/8 [==============================] - 0s 852us/step - loss: 0.0414
Epoch 127/200
8/8 [==============================] - 0s 855us/step - loss: 0.1074
Epoch 128/200
8/8 [==============================] - 0s 857us/step - loss: 0.0768
Epoch 129/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0206
```

```
Epoch 130/200
8/8 [==============================] - 0s 931us/step - loss: 0.0187
Epoch 131/200
8/8 [==============================] - 0s 987us/step - loss: 0.0357
Epoch 132/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0342
Epoch 133/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0169
Epoch 134/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0273
Epoch 135/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0487
Epoch 136/200
8/8 [==============================] - 0s 987us/step - loss: 0.0718
Epoch 137/200
8/8 [==============================] - 0s 941us/step - loss: 0.0570
Epoch 138/200
8/8 [==============================] - 0s 847us/step - loss: 0.8302
Epoch 139/200
8/8 [==============================] - 0s 896us/step - loss: 0.8640
Epoch 140/200
8/8 [==============================] - 0s 828us/step - loss: 0.4837
Epoch 141/200
8/8 [==============================] - 0s 868us/step - loss: 0.2936
Epoch 142/200
8/8 [==============================] - 0s 856us/step - loss: 0.1449
Epoch 143/200
8/8 [==============================] - 0s 1ms/step - loss: 0.2548
Epoch 144/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1871
Epoch 145/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1665
Epoch 146/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0804
Epoch 147/200
8/8 [==============================] - 0s 844us/step - loss: 0.0258
Epoch 148/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0216
Epoch 149/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 150/200
8/8 [==============================] - 0s 893us/step - loss: 0.0615
Epoch 151/200
8/8 [==============================] - 0s 806us/step - loss: 0.0285
Epoch 152/200
8/8 [==============================] - 0s 890us/step - loss: 0.0153
Epoch 153/200
8/8 [==============================] - 0s 803us/step - loss: 0.0889
Epoch 154/200
8/8 [==============================] - 0s 856us/step - loss: 0.0997
Epoch 155/200
8/8 [==============================] - 0s 933us/step - loss: 0.0603
Epoch 156/200
8/8 [==============================] - 0s 913us/step - loss: 0.0136
Epoch 157/200
8/8 [==============================] - 0s 939us/step - loss: 0.0265
Epoch 158/200
8/8 [==============================] - 0s 2ms/step - loss: 0.0222
Epoch 159/200
```

```
8/8 [==============================] - 0s 984us/step - loss: 0.0261
Epoch 160/200
8/8 [==============================] - 0s 803us/step - loss: 0.0176
Epoch 161/200
8/8 [==============================] - 0s 865us/step - loss: 0.0403
Epoch 162/200
8/8 [==============================] - 0s 806us/step - loss: 0.0686
Epoch 163/200
8/8 [==============================] - 0s 1000us/step - loss: 0.0211
Epoch 164/200
8/8 [==============================] - 0s 823us/step - loss: 0.0215
Epoch 165/200
8/8 [==============================] - 0s 862us/step - loss: 0.0340
Epoch 166/200
8/8 [==============================] - 0s 786us/step - loss: 0.1137
Epoch 167/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1860
Epoch 168/200
8/8 [==============================] - 0s 741us/step - loss: 0.1252
Epoch 169/200
8/8 [==============================] - 0s 933us/step - loss: 0.0828
Epoch 170/200
8/8 [==============================] - 0s 961us/step - loss: 0.1649
Epoch 171/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1950
Epoch 172/200
8/8 [==============================] - 0s 953us/step - loss: 0.1378
Epoch 173/200
8/8 [==============================] - 0s 896us/step - loss: 0.1957
Epoch 174/200
8/8 [==============================] - 0s 755us/step - loss: 0.2259
Epoch 175/200
8/8 [==============================] - 0s 866us/step - loss: 0.3442
Epoch 176/200
8/8 [==============================] - 0s 961us/step - loss: 0.2958
Epoch 177/200
8/8 [==============================] - 0s 876us/step - loss: 0.1152
Epoch 178/200
8/8 [==============================] - 0s 829us/step - loss: 0.1392
Epoch 179/200
8/8 [==============================] - 0s 855us/step - loss: 0.2408
Epoch 180/200
8/8 [==============================] - 0s 996us/step - loss: 0.2347
Epoch 181/200
8/8 [==============================] - 0s 855us/step - loss: 0.5008
Epoch 182/200
8/8 [==============================] - 0s 944us/step - loss: 0.2640
Epoch 183/200
8/8 [==============================] - 0s 858us/step - loss: 0.8248
Epoch 184/200
8/8 [==============================] - 0s 966us/step - loss: 0.0435
Epoch 185/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0441
Epoch 186/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1219
Epoch 187/200
8/8 [==============================] - 0s 1ms/step - loss: 0.0274
Epoch 188/200
8/8 [==============================] - 0s 999us/step - loss: 0.0255
```

```
Epoch 189/200
8/8 [==============================] - 0s 1ms/step - loss: 0.1417
Epoch 190/200
8/8 [==============================] - 0s 896us/step - loss: 0.1879
Epoch 191/200
8/8 [==============================] - 0s 868us/step - loss: 0.4919
Epoch 192/200
8/8 [==============================] - 0s 867us/step - loss: 0.5420
Epoch 193/200
8/8 [==============================] - 0s 872us/step - loss: 0.4407
Epoch 194/200
8/8 [==============================] - 0s 764us/step - loss: 0.4668
Epoch 195/200
8/8 [==============================] - 0s 865us/step - loss: 0.5480
Epoch 196/200
8/8 [==============================] - 0s 856us/step - loss: 0.9265
Epoch 197/200
8/8 [==============================] - 0s 889us/step - loss: 5.5766
Epoch 198/200
8/8 [==============================] - 0s 858us/step - loss: 0.7069
Epoch 199/200
8/8 [==============================] - 0s 863us/step - loss: 0.2435
Epoch 200/200
8/8 [==============================] - 0s 998us/step - loss: 1.1012

******* WEIGHTS OF ANN *******

Weights W0:
 [[ 0.25050122 -0.19483845  0.07777891  0.29266936  0.23067392  0.06728806
   0.25782764  0.15187243  0.10790432  0.00649369 -0.20610467  0.2691905
   0.14983475 -0.09820077 -0.31648204 -0.03727894  0.20576605  0.1028286
  -0.06096408  0.03351346 -0.15763268  0.20005827 -0.0320709   0.14598341
  -0.17795168 -0.2879276   0.27371174  0.20376056 -0.26511857 -0.22110343
  -0.20877749  0.19281629 -0.06889552 -0.16301966  0.23815978 -0.30815026
   0.0855363  -0.05567142 -0.06001994 -0.3119055  -0.2056062   0.10694826
  -0.02580558 -0.2800896  -0.16462919  0.08196212 -0.02976584 -0.1386301
   0.03040108  0.29593778]
 [ 0.16608244 -0.21746342 -0.25585663  0.10270813  0.05045023  0.22753333
   0.03133137  0.11620346 -0.13703817 -0.17204477 -0.15272452 -0.32442725
  -0.07888973 -0.07944039  0.1836489   0.1733437   0.06341343 -0.05284219
  -0.20578438  0.17283238  0.08347466  0.21433501  0.25870988  0.07894352
  -0.31869653  0.28680757 -0.16287248 -0.22065264 -0.26126045  0.02723276
   0.25234443 -0.10125241 -0.13056648  0.00639093 -0.2991232  -0.21456787
  -0.2900277   0.03659779 -0.00816143 -0.0590705  -0.07556263  0.10881842
  -0.0533394  -0.05680528  0.04976448  0.04819602 -0.05910209 -0.23006319
  -0.12047251  0.23054242]
 [ 0.01658607 -0.17626396 -0.2763888   0.2447586   0.06496304 -0.23961666
  -0.20622583 -0.16503887 -0.03363314  0.3079478   0.22777528 -0.03925848
  -0.26124507  0.01833835  0.01177986 -0.2791015   0.02286865 -0.0580737
   0.19158143 -0.14958708  0.08966399  0.15438312 -0.19564952 -0.20654927
  -0.06160027 -0.21799275  0.02558982 -0.26445538  0.15430632  0.24544244
  -0.11618371 -0.01340619  0.29075682  0.12953681 -0.2832227  -0.19081499
   0.15386125  0.21066457 -0.17304173 -0.09057236  0.01490188 -0.25226995
  -0.18208767  0.09347892  0.23749764 -0.00139017 -0.12476234 -0.20408106
  -0.22143483  0.04986448]
 [-0.17785598  0.2929302  -0.17171276  0.19059736 -0.29841968 -0.11826871
   0.2581282  -0.18300152 -0.31173193  0.32483572  0.18399155 -0.3182526
  -0.21171227 -0.02421084  0.01544456 -0.09996208 -0.15460731 -0.18885265
   0.097197    0.24327488 -0.07714031  0.16909727 -0.15629876 -0.19686265
```

```
   0.2130112   0.18119425  0.02442122 -0.04534382 -0.05611125  0.07586411
   0.0666655  -0.32715297  0.19303143  0.02998194  0.0133566  -0.0694415
  -0.04694006 -0.03308463  0.11996454  0.05660823  0.12258306  0.23318549
   0.14275855 -0.02919927 -0.21648218  0.01062345  0.10803515 -0.17161094
  -0.19485417  0.1984231 ]
 [-0.27287015  0.17845863 -0.19085129  0.28128603  0.04405998  0.10445832
  -0.2386494   0.12844937  0.16709688 -0.05098179 -0.16002852 -0.1760613
   0.01579383 -0.15938242 -0.42265362  0.21485609 -0.11954839  0.07393393
   0.13283294 -0.06565934 -0.17729814 -0.30351314 -0.02230845 -0.06267009
   0.22747177  0.16173974 -0.2322534  -0.21099141 -0.0559597  -0.01998427
  -0.23678678  0.08200479  0.14561439  0.00681531  0.18856615 -0.05564675
  -0.12252523  0.0616914  -0.23387438 -0.02551925 -0.23754013  0.11799254
   0.33674952 -0.18843481  0.20896728 -0.08212018  0.20674372 -0.07081664
   0.12691227 -0.10449469]
 [ 0.09693378 -0.12127478  0.3250635  -0.3226663  -0.2556385  -0.11280267
   0.10286646 -0.02648475  0.20614013 -0.00572625 -0.07151309  0.31307694
  -0.20256269 -0.06612107  0.14485978  0.07349061  0.04876101  0.24216014
   0.14833003 -0.16589567  0.27545673 -0.1806019  -0.25512058  0.13602266
   0.0061042   0.19290602 -0.18672822 -0.2195684   0.15537119  0.17766131
  -0.28493038  0.06883722 -0.24256852  0.0276902  -0.08346838  0.05788341
   0.13584054 -0.24287474 -0.07855384 -0.24301913 -0.2781314  -0.02296716
   0.0969907   0.02450013  0.30769023 -0.10701576 -0.14988282 -0.3032656
   0.27955148 -0.07134645]]
Bias b0:
 [-0.00575271  0.         -0.00499273  0.00326312  0.00286322 -0.00383845
 -0.02222349 -0.00551012  0.00242669  0.          0.          0.00288527
  0.          0.          0.00586526 -0.0036489  -0.01067092 -0.00253782
  0.          0.00245286 -0.00374755 -0.00520769 -0.02093376 -0.01076196
  0.          0.00780964  0.          0.          0.         -0.00194343
  0.          0.00053371  0.          0.          0.          0.
  0.          0.          0.          0.          0.          0.00345477
  0.00370742  0.          0.00364911 -0.00469565  0.          0.
  0.00370046 -0.0051291 ]
Weights W1:
 [[-0.02970798  0.23453881  0.00849999 ... -0.11166609 -0.18715063
  -0.13963485]
 [-0.05378413 -0.2305288  -0.01243584 ...  0.15058072  0.17575122
   0.00387819]
 [-0.13093343 -0.18168756  0.19778849 ... -0.03534668 -0.04504491
  -0.1658912 ]
 ...
 [-0.0171891   0.11016573  0.1305901  ... -0.15227894 -0.06910704
  -0.155527  ]
 [-0.15778708  0.01243888 -0.16041967 ...  0.09539849 -0.03309795
  -0.10281983]
 [-0.01036695 -0.10210016  0.19689222 ...  0.00822018  0.13573171
   0.2125402 ]]
Bias b1:
 [ 0.          0.          0.         -0.00402965 -0.00415372  0.
  0.00306496  0.          0.         -0.0055281   0.          0.
  0.00429701  0.00407839 -0.00146154  0.          0.         -0.0053097
  0.00350876 -0.00318014  0.         -0.00594907  0.          0.
  0.          0.          0.          0.         -0.00420969  0.
  0.          0.          0.          0.         -0.00555859  0.
  0.          0.          0.          0.00326865  0.0035643   0.
  0.          0.         -0.00578128  0.          0.         -0.00483231
  0.          0.        ]
Weights W2:
 [[ 0.15370141  0.18651687  0.22345002 ...  0.04259275  0.01574732
```

```
   0.02910839]
 [-0.2132692  -0.19694409  0.19419558 ... -0.14748526 -0.10058275
   0.20636873]
 [-0.20017503 -0.10258424  0.1834278  ... -0.21537116  0.10145302
   0.07668971]
 ...
 [-0.08217746 -0.16048065 -0.02204282 ...  0.21939115 -0.06916416
  -0.11578141]
 [-0.04313587 -0.20966643 -0.01635772 ...  0.22009371  0.1232634
  -0.22109078]
 [-0.11299802  0.2161897  -0.17170635 ... -0.019899    0.00701527
  -0.13896325]]
Bias b2:
 [ 0.          0.00399507 -0.00415123  0.          0.          0.
  0.00400778  0.          0.          0.         -0.00418012  0.0040296
  0.          0.         -0.00517941  0.          0.          0.
 -0.00422447  0.00026405  0.00382343 -0.00415705  0.          0.00364763
 -0.00414411  0.          0.00405031  0.          0.          0.00402229
  0.          0.          0.00401804 -0.00414307 -0.00419803  0.
  0.          0.          0.          0.00391435  0.0039244   0.
 -0.00425863 -0.00423487 -0.00418231 -0.00377217 -0.00344554  0.00387341
  0.         -0.00683546]
Weights W3:
 [[ 0.11129263]
 [ 0.18937987]
 [-0.28244898]
 [-0.2488403 ]
 [ 0.2843862 ]
 [ 0.21144453]
 [ 0.18907094]
 [ 0.00715548]
 [ 0.08701625]
 [ 0.17703447]
 [-0.222713  ]
 [ 0.3290789 ]
 [-0.12924388]
 [ 0.33814463]
 [-0.13371614]
 [-0.25298208]
 [-0.20659044]
 [ 0.03620687]
 [-0.15395015]
 [-0.13495304]
 [ 0.06074893]
 [-0.26241088]
 [-0.1928121 ]
 [ 0.03580643]
 [-0.22826071]
 [-0.28047824]
 [ 0.2790331 ]
 [ 0.05635393]
 [-0.13334082]
 [ 0.3125827 ]
 [-0.20131788]
 [-0.08784252]
 [ 0.20456077]
 [-0.06784453]
 [-0.19262597]
 [ 0.07971489]
```

```
 [-0.0971781 ]
 [-0.06846091]
 [ 0.10365155]
 [ 0.0892619 ]
 [ 0.09579279]
 [-0.13528638]
 [-0.12474099]
 [-0.10738315]
 [-0.1846378 ]
 [-0.20629889]
 [ 0.15825902]
 [ 0.07047375]
 [ 0.08944446]
 [ 0.1124473 ]]
Bias b3:
 [0.00411059]


********** ANN training complete **********


1/1 [==============================] - 0s 32ms/step

**************************************
ANN Predicted Next Day Stock Movement: +1.80%
**************************************
```

In [6]: