第二次上机作业

1. 模拟产生1000个随机变量X服从均匀分布U(1/3)，进而利用Y=-3X+2产生1000个Y。

答案：

>> X=exprnd (1/3,100,10);

Y=-3\*X+2

Y =

1.5398 1.7552 1.3144 1.1004 1.3145 0.0357 1.6029 1.8236 0.3816 0.3572

0.9646 1.6344 1.2858 1.5949 1.5103 0.6534 1.1595 1.4634 0.3656 1.7182

1.9970 -2.6251 1.8688 1.9314 1.8008 -0.4440 1.6353 1.9467 0.8817 0.9394

0.5047 1.8295 0.9591 1.7905 1.3687 1.1546 0.6405 -0.7964 1.8726 1.1292

1.5730 1.9191 1.2003 1.2755 0.4009 0.6424 -2.6296 1.4632 1.2473 0.1403

1.4975 1.7399 1.9628 1.7213 1.2101 0.7878 1.3694 0.7451 1.0936 1.8003

1.0513 -1.1545 -1.1630 1.1254 1.1512 1.1440 0.7249 1.8109 0.2809 1.5299

0.0494 1.0276 1.9726 1.9714 1.9655 -0.1269 1.9447 0.3444 1.9684 1.6969

-1.6835 1.6495 0.3351 1.9879 1.5221 1.2969 1.9018 1.1848 1.1022 1.7832

1.1351 1.6846 1.5952 1.8540 1.6367 1.6524 1.0653 1.0671 1.8310 -0.6997

0.3077 0.5051 1.4663 1.0555 1.6717 0.5877 -1.6947 1.8095 1.5144 1.9495

1.6795 0.6872 1.6071 1.2120 0.9413 1.7580 1.6017 1.6097 1.0235 1.3020

1.0067 1.6040 0.9812 0.6004 1.3403 -0.6025 1.8223 0.4279 1.8690 1.7192

1.8275 1.2608 1.5224 1.7572 1.4143 1.0683 1.9711 0.8546 1.7577 1.7021

1.6911 1.5279 1.7907 1.8754 0.1453 -3.6857 -0.8659 -0.0113 1.2342 1.8150

1.4397 0.5580 -1.9499 1.9098 1.4238 0.4889 1.2022 1.6017 1.7942 0.1453

0.2676 0.2691 -0.4784 1.4171 1.6359 -4.6450 1.4595 1.4396 1.8929 1.2176

1.9564 1.8132 1.9745 1.4873 1.1478 0.3349 1.6241 0.2267 1.1543 1.5189

0.6732 1.7346 1.5713 0.0954 1.8212 0.0515 1.6707 0.0871 0.9044 1.9298

1.9216 1.9322 0.5357 1.8943 1.6872 0.6835 1.5693 1.2578 1.4836 1.8198

0.5029 -0.2267 1.0924 1.2024 0.9784 0.2564 1.6811 1.9036 1.8968 1.8895

1.0153 0.2975 -0.1036 0.4185 1.2108 0.0242 1.0161 1.4061 1.6463 1.4596

-0.4361 -0.3117 0.6849 1.8943 1.0491 1.4873 1.4580 -1.4131 1.0257 1.4600

1.5539 1.2862 0.6446 1.7290 1.7458 1.8958 -0.1531 -0.9213 1.6921 1.8433

0.2886 0.3562 0.8964 1.8750 1.6911 1.9375 -0.8533 1.7832 1.9530 -1.3563

-1.1000 1.8901 0.1177 0.7446 1.1567 0.4912 1.9796 1.2045 1.3890 1.8783

1.6759 -0.3117 0.9445 1.6043 1.6344 1.2716 0.7441 1.0394 1.3840 1.1029

0.9428 -1.1198 -0.1065 1.5909 1.9437 1.0219 1.4808 1.7638 0.8324 -1.3137

1.5854 1.4153 1.8769 -0.0971 1.7570 1.3533 1.9614 0.9902 -0.6418 1.7072

1.0425 1.7419 -0.3615 1.1018 1.6513 0.6715 0.3168 1.3695 0.2961 0.1346

1.5337 0.8351 1.9275 0.7101 -0.2133 -0.6830 0.3551 1.6598 -0.3753 0.0614

-1.8328 0.2795 1.0813 1.6669 1.0582 1.1706 0.9260 1.8624 1.2310 1.4991

1.9063 0.9181 -1.0491 0.7390 1.4739 0.2505 1.9305 0.8874 -2.6743 0.6315

1.7776 0.4400 0.9281 1.8904 1.2221 -1.6455 1.0601 1.5694 1.9112 0.8735

1.7068 1.3270 1.6934 1.8095 -0.9890 1.9536 0.7025 1.9745 1.5580 1.0882

1.7931 1.9017 1.7702 1.0585 0.5246 1.1574 0.1158 -0.5775 -4.5578 1.0995

1.0411 1.5363 1.3929 1.3026 1.8187 1.9608 1.0765 1.4673 -1.4938 1.0486

1.5176 -0.2874 1.6234 1.6359 -2.1576 1.7287 1.0184 1.1178 0.4320 1.5054

1.4475 1.0606 1.8875 1.8189 1.8535 -2.9132 -0.0317 0.8260 1.2125 0.2096

1.3652 -0.9074 -0.9042 1.5051 -0.5502 1.6144 1.1677 0.6676 -0.0615 0.3292

0.7093 1.3094 0.8082 1.4462 1.5981 1.6518 -0.3913 1.7239 -2.7505 -0.3578

0.6082 1.1600 -1.0750 0.8793 1.3073 1.5617 1.5133 1.9952 1.6813 0.8705

1.2051 1.9976 0.3677 1.2157 0.4767 1.4064 -2.5118 0.3211 0.9619 1.7381

0.5203 1.7913 1.6717 1.6628 1.4407 0.4772 1.4436 1.7530 1.7521 0.5481

1.7824 1.2777 1.6739 1.8772 -0.1022 1.7417 1.7639 0.3693 1.1714 1.6994

1.9860 1.8885 1.8697 1.6727 1.6013 0.5217 0.5534 1.9923 1.1712 1.6330

-1.5068 0.0162 1.4595 -1.9839 1.4885 1.0081 1.1971 1.7797 -1.0116 1.8065

1.3758 1.0584 -0.6495 1.6066 -0.8828 1.8845 1.4368 1.1425 -1.0031 1.8112

-0.4410 1.9246 1.9196 1.1756 -0.8763 1.8450 -0.7903 1.6837 -0.3958 0.7737

1.7795 1.9139 1.7773 1.1741 0.1194 1.0898 1.2994 1.3036 1.4792 0.8268

1.9891 1.6625 0.7481 -0.1453 -1.9312 0.8544 1.5573 1.7880 0.5774 1.3519

-0.7039 1.5193 1.3906 1.7950 1.1680 1.5035 0.4916 0.9686 1.8273 0.8770

1.9375 0.9308 1.9847 0.8756 1.8163 1.9059 1.8221 -0.6140 1.8459 1.8159

-2.0076 1.9339 1.6655 0.5985 1.5177 1.9047 1.9706 1.4740 1.9629 1.7896

1.6200 -0.0813 1.8244 0.9291 1.3463 1.4751 1.8332 1.9059 1.2844 1.4148

1.7563 1.6861 1.1636 1.0210 1.8537 0.8991 1.3188 0.3589 0.4873 0.6643

1.3729 1.5638 1.2463 1.3959 -0.3259 1.8411 0.7230 1.1615 0.5137 1.6152

1.8782 1.8175 1.4215 1.4236 1.9035 1.1845 1.7078 1.7112 1.3778 0.5461

1.8935 1.0794 0.6873 1.0732 -0.2255 1.8995 0.5600 -1.2395 1.7283 1.2157

1.5315 1.7121 1.7110 1.0790 1.3403 -1.4058 1.9564 1.9448 0.9432 1.0444

0.0185 1.8199 1.3146 1.3371 0.0562 1.3697 1.5224 1.7304 1.2261 1.3812

0.4758 0.8682 1.5643 1.5807 1.4191 1.6666 1.4896 1.4181 1.5527 1.9917

0.2970 1.4063 0.8215 1.9497 -3.3861 0.2813 0.2432 0.3063 1.9137 1.7193

-1.1744 1.9789 0.0247 1.6748 1.7343 0.9109 -0.4041 1.3027 0.1772 1.9803

-0.2355 1.4009 1.2568 1.0839 1.8360 0.3272 0.6345 1.3419 1.6654 0.5509

1.5162 0.8926 0.9852 1.8159 1.9132 0.8666 1.8475 1.9942 1.4514 1.3624

1.9378 1.5211 1.7619 -0.0074 1.9869 1.0933 1.9069 1.8432 1.1637 -0.9674

0.9628 0.9801 1.7519 -0.8057 1.3171 1.3996 1.6428 1.9617 1.8770 1.7214

1.1099 1.7210 1.5973 -0.4740 0.6959 -1.0213 1.6787 1.6128 1.0662 1.4925

1.9842 1.1179 -0.0136 0.1915 -0.2951 1.4071 0.5298 1.0924 0.2795 1.8459

1.9440 1.2914 -1.8371 0.8737 1.3224 0.7083 1.4484 1.9328 1.5432 1.9882

1.6094 1.6358 1.4199 0.8018 1.4649 0.5791 1.7901 1.2650 1.5284 1.9269

1.9882 1.9724 0.7988 -2.4498 1.7294 0.5859 1.0933 0.5381 0.8851 1.1072

1.7345 0.8845 1.9375 1.3836 -0.4894 0.1302 1.9884 1.0744 1.7806 -5.9823

0.9114 1.8230 1.9807 -0.3500 1.5869 1.9554 -0.4080 1.6506 1.9995 1.3854

1.5881 1.6976 0.7504 0.0794 1.3402 1.9335 0.8635 1.4176 1.9808 0.4285

0.5901 1.9531 1.7779 1.5398 0.2342 1.8000 1.3294 1.7211 -0.0633 0.4826

0.7809 -1.4444 1.8903 1.8484 1.9366 1.6829 -0.8034 1.9955 0.5400 0.8785

1.6146 0.9696 1.4850 1.9739 1.4732 0.2617 1.6794 1.9617 -1.7451 -0.3439

1.3611 1.5885 1.8767 1.4394 1.1805 0.9794 1.4140 1.3746 1.5015 1.7090

1.1123 0.7324 1.9421 1.9968 1.9402 0.3329 1.3639 1.9632 -0.1999 1.7103

1.4936 0.5320 1.4006 1.4086 1.5783 -4.7268 1.8136 -0.1574 1.1022 1.3899

1.7130 1.6591 1.6831 1.3373 1.2058 0.8493 1.8477 -0.9672 1.8768 0.9157

1.4613 1.5293 1.4497 0.8934 1.8253 1.6428 1.7630 0.8104 1.3988 1.8165

1.4054 1.4734 -1.6552 1.1560 1.3701 1.5304 0.8538 1.4556 1.0030 1.4068

1.4614 1.5851 1.1938 1.2903 1.4092 1.3895 1.2064 1.3669 0.4314 1.9566

1.3302 -1.0459 1.5635 -0.6446 1.6144 1.1768 1.7153 1.8960 1.1812 1.8866

-0.4938 0.9467 1.3484 1.8809 0.9981 0.7532 -0.2085 1.3848 1.9552 0.9686

1.6709 1.2045 1.0120 -0.7390 0.5699 1.3102 -0.2096 1.1606 -0.0873 1.3956

1.9961 0.5766 1.9351 1.1703 1.4534 1.7276 0.6902 1.3887 1.2466 0.9407

0.9630 1.6646 1.8131 1.8096 1.8572 1.7287 1.3550 1.6609 1.8456 1.5265

1.9708 1.8447 1.8364 1.0700 1.1005 1.4484 1.9723 -2.0939 -1.1375 1.7726

0.9400 0.7324 1.0126 1.5114 -0.1838 1.7092 1.6581 1.7780 1.6313 1.7068

1.8796 1.6867 1.4778 1.7999 1.1877 1.5623 0.8348 0.0517 1.9788 -0.0752

1.2119 0.0178 1.8637 1.8792 0.7966 -0.0938 0.7671 1.2628 0.7386 1.8045

1.1167 1.8217 1.9312 1.9286 1.0872 1.3156 1.8379 0.6407 -0.0116 -1.6829

0.4755 0.0238 1.5972 0.3434 1.8177 0.9423 1.9075 1.0033 1.6221 1.1191

-0.0742 1.4693 0.4239 0.6475 1.0927 -0.3844 1.5526 1.5872 1.9051 1.6872

0.8253 0.9953 1.5751 1.8923 1.0588 0.0884 0.6350 0.2257 1.5071 1.7533

1.6799 1.7853 -0.6304 1.4780 0.9796 0.3814 -0.4229 0.7227 1.8946 0.9984

1. 根据问题1产生的数据分别计算X和Y的方差D(X)和D(Y)，以及协方差Cov(X,Y)。利用上述信息计算X和Y的相关系数。

答：

>> D=std2(X)^2

D =

0.1087

>> D2=std2(Y)^2

D2 =

0.9786

>> C=cov(X,Y)

C =

0.1087 -0.3262

-0.3262 0.9786

>> P=corrcoef(X,Y)

P =

1 -1

-1 1

1. 重复问题1和2，讨论当, n=3, 6, 9时，X和Y的相关系数的变化。

答：

n=3:

>> Y=power(X,1/3);

cov(X,Y)

ans =

0.1087 0.0670

0.0670 0.0497

>> P=corrcoef(X,Y)

P =

1.0000 0.9114

0.9114 1.0000

n=6：

>> Y=power(X,1/6)

cov(X,Y)

ans =

0.1087 0.0419

0.0419 0.0222

>> P=corrcoef(X,Y)

P =

1.0000 0.8514

0.8514 1.0000

n=9:

>> Y=power(X,1/9);

cov(X,Y)

ans =

0.1087 0.0303

0.0303 0.0124

P =

1.0000 0.9114

0.9114 1.0000

**结论：**

随着N不断变大，

X,Y之间的协方差趋近于0；

相关系数的绝对值越来越小；