

17.8: Matlab files for "Problems" in "Applied Probability"

npr02_04

```
% file npr02_04.m
% Data for problem P2-4
pm = [0.0168  0.0392  0.0672  0.1568  0.0072  0.0168  0.0288  0.0672 ...
      0.0252  0.0588  0.1008  0.2352  0.0108  0.0252  0.0432  0.1008];
disp('Minterm probabilities are in pm.  Use mintable(4)')
```

npr02_05

```
% file npr02_05.m
% Data for problem P2-5
pm = [0.0216  0.0144  0.0504  0.0336  0.0324  0.0216  0.0756  0.0504  0.0216 ...
      0.0144  0.0504  0.0336  0.0324  0.0216  0.0756  0.0504  0.0144  0.0096 ...
      0.0336  0.0224  0.0216  0.0144  0.0504  0.0336  0.0144  0.0096  0.0336 ...
      0.0224  0.0216  0.0144  0.0504  0.0336];
disp('Minterm probabilities are in pm.  Use mintable(5)')
```

npr02_06

```
% file npr02_06.m
% Data for problem P2-6
minvec3
DV = [A|Ac; A|(Bc&C); A&C; Ac&B; Ac&Cc; B&Cc];
DP = [1      0.65      0.20 0.25  0.25  0.30];
TV = [((A&Cc)|(Ac&C))&Bc; ((A&Bc)|Ac)&Cc; Ac&(B|Cc)];
disp('Call for mincalc')
```

npr02_07

```
% file npr02_07.m
% Data for problem P2-7
minvec3
DV = [A|Ac; ((A&Bc)|(Ac&B))&C; A&B; Ac&Cc; A; C; A&Bc&Cc];
DP = [ 1      0.4      0.2  0.3  0.6 0.5  0.1];
TV = [(Ac&Cc)|(A&C); ((A&Bc)|Ac)&Cc; Ac&(B|Cc)];
disp('Call for mincalc')
```

npr02_08

```
% file npr02_08.m
% Data for problem P2-8
minvec3
DV = [A|Ac; A; C; A&C; Ac&B; Ac&Bc&Cc];
DP = [ 1  0.6 0.4  0.3  0.2  0.1];
```

```
TV = [(A|B)&Cc; (A&Cc)|(Ac&C); (A&Cc)|(Ac&B)];  
disp('Call for mincalc')
```

npr02_09

```
% file npr02_09.m  
% Data for problem P2-9  
minvec3  
DV = [A|Ac; A; A&B; A&C; A&B&Cc];  
DP = [ 1    0.5 0.3  0.3  0.1];  
TV = [A&(~(B&Cc)); (A&B)|(A&C)|(B&C)];  
disp('Call for mincalc')  
  
% Modification for part 2  
% DV = [DV; Ac&Bc&Cc; Ac&B&C];  
% DP = [DP 0.1 0.05];
```

npr02_10

```
% file npr02_10.m  
% Data for problem P2-10  
minvec4  
DV = [A|Ac; A; Ac&Bc; A&Cc; A&C&Dc];  
DP = [1    0.6 0.2  0.4  0.1];  
TV = [(Ac&B)|(A&(Cc|D))];  
disp('Call for mincalc')
```

npr02_11

```
% file npr02_11.m  
% Data for problem P2-11  
% A = male; B = on campus; C = active in sports  
minvec3  
DV = [A|Ac; A; B; A|C; B&Cc; A&B&C; A&Bc; A&Cc];  
DP = [ 1    0.52 0.85 0.78 0.30 0.32  0.08 0.17];  
TV = [A&B; A&B&Cc; Ac&C];  
disp('Call for mincalc')
```

npr02_12

```
% file npr02_12.m  
% Data for problem P2-12  
% A = male; B = party member; C = voted last election  
minvec3  
DV = [A|Ac; A; A&Bc; B; Bc&C; Ac&Bc&C];  
DP = [ 1    0.60 0.30  0.50 0.20  0.10];
```

```
TV = [Bc&Cc];
disp('Call for mincalc')
```

npr02_13

```
% file npr02_13.m
% Data for problem P2-13
% A = rain in Austin; B = rain in Houston;
% C = rain in San Antonio
minvec3
DV = [A|Ac; A&B; A&Bc; A&C; (A&Bc)|(Ac&B); B&C; Bc&C; Ac&Bc&Cc];
DP = [ 1 0.35 0.15 0.20 0.45 0.30 0.05 0.15];
TV = [A&B&C; (A&B&Cc)|(A&Bc&C)|(Ac&B&C); (A&Bc&Cc)|(Ac&B&Cc)|(Ac&Bc&C)];
disp('Call for mincalc')
```

npr02_14

```
% file npr02_14.m
% Data for problem P2-14
% A = male; B = engineering;
% C = foreign language; D = graduate study
minvec4
DV = [A|Ac; A; B; Ac&B; C; Ac&C; A&D; Ac&D; A&B&D; ...
      Ac&B&D; B&C&D; Bc&Cc&D; Ac&Bc&C&D];
DP = [1 0.55 0.23 0.10 0.75 0.45 0.26 0.19 0.13 0.08 0.20 0.05 0.11];
TV = [C&D; Ac&Dc; A&((C&Dc)|(Cc&D))];
disp('Call for mincalc')
```

npr02_15

```
% file npr02_15.m
% Data for problem P2-15
% A = men; B = on campus; C = readers; D = active
minvec4
DV = [A|Ac; A; B; Ac&B; C; Ac&C; D; B&D; C&D; ...
      Ac&B&D; Ac&Bc&D; Ac&B&C&D; Ac&Bc&C&D; A&Bc&Cc&D];
DP = [1 0.6 0.55 0.25 0.40 0.25 0.70 0.50 0.35 0.25 0.05 0.10 0.05 0.05];
TV = [A&D&(Cc|Bc); A&Dc&Cc];
disp('Call for mincalc')
```

npr02_16

```
% file npr02_16.m
% Data for problem P2-16
minvec3
DV = [A|Ac; A; B; C; (A&B)|(A&C)|(B&C); A&B&C; A&C; (A&B)-2*(B&C)];
DP = [ 1 0.221 0.209 0.112 0.197 0.045 0.062 0];
```

```
TV = [A|B|C; (A&B&C)|(A&B&C)|(A&B&C)];  
disp('Call for mincalc')
```

npr02_17

```
% file npr02_17.m  
% Data for problem P2-17  
% A = alignment; B = brake work; C = headlight  
minvec3  
DV = [A|Ac; A&B&C; (A&B)|(A&C)|(B&C); B&C; A ];  
DP = [ 1 0.100 0.325 0.125 0.550];  
TV = [A&B&C; Ac&~(B&C)];  
disp('Call for mincalc')
```

npr02_18

```
% file npr02_18.m  
% Date for problem P2-18  
minvec3  
DV = [A|Ac; A&(B|C); Ac; Ac&B&C];  
DP = [ 1 0.3 0.6 0.1];  
TV = [B|C; (((A&B)|(A&B&C))&C)|(A&C); Ac&(B|C)];  
disp('Call for mincalc')  
  
% Modification  
% DV = [DV; Ac&B&C; Ac&B];  
% DP = [DP 0.2 0.3];
```

npr02_19

```
% file npr02_19.m  
% Data for problem P2-19  
% A = computer; B = monitor; C = printer  
minvec3  
DV = [A|Ac; A&B; A&B&C; A&C; B&C; (A&C)|(A&C); ...  
      (A&B)|(A&B); (B&C)|(B&C)];  
DP = [1 0.49 0.17 0.45 0.39 0.50 0.43 0.43];  
TV = [A; B; C; (A&B&C)|(A&B&C)|(A&B&C); (A&B)|(A&C)|(B&C); A&B&C];  
disp('Call for mincalc')
```

npr02_20

```
% file npr02_20.m  
% Data for problem P2-20  
minvec3  
DV = [A|Ac; A; B; A&B&C; A&C; (A&B)|(A&C)|(B&C); B&C - 2*(A&C)];  
DP = [ 1 0.232 0.228 0.045 0.062 0.197 0];
```

```
TV = [A|B|C; Ac&Bc&C];  
disp('Call for mincalc')  
% Modification  
% DV = [DV; C];  
% DP = [DP 0.230];
```

npr02_21

```
% file npr02_21.m  
% Data for problem P2-21  
minvec3  
DV = [A|Ac; A; A&B; A&B&C; C; Ac&Cc];  
DP = [ 1 0.4 0.3 0.25 0.65 0.3];  
TV = [(A&Cc)|(Ac&C); Ac&Bc; A|B; A&Bc];  
disp('Call for mincalc')  
% Modification  
% DV = [DV; Ac&B&Cc; Ac&Bc];  
% DP = [DP 0.1 0.3];
```

npr02_22

```
% file npr02_22.m  
% Data for problem P2-22  
minvec3  
DV = [A|Ac; A; A&B; A&B&C; C; Ac&Cc];  
DP = [ 1 0.4 0.5 0.25 0.65 0.3];  
TV = [(A&Cc)|(Ac&C); Ac&Bc; A|B; A&Bc];  
disp('Call for mincalc')  
% Modification  
% DV = [DV; Ac&B&Cc; Ac&Bc];  
% DP = [DP 0.1 0.3];
```

npr02_23

```
% file npr02_23.m  
% Data for problem P2-23  
minvec3  
DV = [A|Ac; A; A&C; A&B&C; C; Ac&Cc];  
DP = [ 1 0.4 0.3 0.25 0.65 0.3];  
TV = [(A&Cc)|(Ac&C); Ac&Bc; A|B; A&Bc];  
disp('Call for mincalc')  
% Modification  
% DV = [DV; Ac&B&Cc; Ac&Bc];  
% DP = [DP 0.1 0.3];
```

npr03_01

```
% file npr03_01.m
% Data for problem P3-1
minvec3
DV = [A|Ac; A; A&B; B&C; Ac|(B&C); Ac&B&Cc];
DP = [ 1    0.55 0.30 0.20    0.55    0.15  ];
TV = [Ac&B; B];
disp('Call for mincalc')
```

npr04_04

```
% file npr04_04.m
% Data for problem P4-4
pm = [0.032 0.016 0.376 0.011 0.364 0.073 0.077 0.051];
disp('Minterm probabilities for P4-4 are in pm')
```

npr04_05

```
% file npr04_05.m
% Data for problem P4-5
pm = [0.084 0.196 0.036 0.084 0.085 0.196 0.035 0.084 ...
      0.021 0.049 0.009 0.021 0.020 0.049 0.010 0.021];
disp('Minterm probabilities for P4-5 are in pm')
```

npr04_06

```
% file npr04_06.m
% Data for problem P4-6
pm = [0.085 0.195 0.035 0.085 0.080 0.200 0.035 0.085 ...
      0.020 0.050 0.010 0.020 0.020 0.050 0.015 0.015];
disp('Minterm probabilities for P4-6 are in pm')
```

mpr05_16

```
% file mpr05_16.m
% Data for Problem P5-16
A = [51 26 7; 42 32 10; 19 54 11; 24 53 7; 27 52 5;
     49 19 16; 16 59 9; 47 32 5; 55 17 12; 24 53 7];
B = [27 34 5; 19 43 4; 39 22 5; 38 19 9; 28 33 5;
     19 41 6; 37 21 8; 19 42 5; 27 33 6; 39 21 6];
disp('Call for oddsdf')
```

npr05_17

```
% file npr05_17.m
% Data for problem P5-17
```

```
PG1 = 84/150;
PG2 = 66/125;
A = [0.61 0.31 0.08
     0.50 0.38 0.12
     0.23 0.64 0.13
     0.29 0.63 0.08
     0.32 0.62 0.06
     0.58 0.23 0.19
     0.19 0.70 0.11
     0.56 0.38 0.06
     0.65 0.20 0.15
     0.29 0.63 0.08];
B = [0.41 0.51 0.08
     0.29 0.65 0.06
     0.59 0.33 0.08
     0.57 0.29 0.14
     0.42 0.50 0.08
     0.29 0.62 0.09
     0.56 0.32 0.12
     0.29 0.64 0.08
     0.41 0.50 0.09
     0.59 0.32 0.09];
disp('Call for oddsdsp')
```

npr06_10

```
% file npr06_10.m
% Data for problem P6-10
pm = [ 0.072 0.048 0.018 0.012 0.168 0.112 0.042 0.028 ...
       0.062 0.048 0.028 0.010 0.170 0.110 0.040 0.032];
c = [-5.3 -2.5 2.3 4.2 -3.7];
disp('Minterm probabilities are in pm, coefficients in c')
```

npr06_12

```
% file npr06_12.m
% Data for problem P6-12
pm = 0.001*[5 7 6 8 9 14 22 33 21 32 50 75 86 129 201 302];
c = [1 1 1 1 0];
disp('Minterm probabilities in pm, coefficients in c')
```

npr06_18.m

```
% file npr06_18.m
% Data for problem P6-18
cx = [5 17 21 8 15 0];
cy = [8 15 12 18 15 12 0];
```

```
pmx = minprob(0.01*[37 22 38 81 63]);  
pmy = minprob(0.01*[77 52 23 41 83 58]);  
disp('Data in cx, cy, pmx, pmy')
```

npr07_01

```
\begin{verbatim}  
% file npr07_01.m  
% Data for problem P7-1  
T = [1 3 2 3 4 2 1 3 5 2];  
pc = 0.01*[ 8 13 6 9 14 11 12 7 11 9];  
disp('Data are in T and pc')  
\end{verbatim}
```

npr07_02

```
% file npr07_02.m  
% Data for problem P7-2  
T = [3.5 5.0 3.5 7.5 5.0 5.0 3.5 7.5];  
pc = 0.01*[10 15 15 20 10 5 10 15];  
disp('Data are in T, pc')
```

npr08_01

```
% file npr08_01.m  
% Solution for problem P8-1  
X = 0:2;  
Y = 0:2;  
Pn = [132 24 0; 864 144 6; 1260 216 6];  
P = Pn/(52*51);  
disp('Data in Pn, P, X, Y')
```

npr08_02

```
% file npr08_02.m  
% Solution for problem P8-2  
X = 0:2;  
Y = 0:2;  
Pn = [6 0 0; 18 12 0; 6 12 2];  
P = Pn/56;  
disp('Data are in X, Y, Pn, P')
```

npr08_03

```
% file npr08_03.m  
% Solution for problem P8-3  
X = 1:6;
```



```
Y = 0:6;
P0 = zeros(6,7);          % Initialize
for i = 1:6                % Calculate rows of Y probabilities
    P0(i,1:i+1) = (1/6)*ibinom(i,1/2,0:i);
end
P = rot90(P0);            % Rotate to orient as on the plane
PY = fliplr(sum(P'));     % Reverse to put in normal order
disp('Answers are in X, Y, P, PY')
```

npr08_04

```
% file npr08_04.m
% Solution for problem P8-4
X = 2:12;
Y = 0:12;
PX = (1/36)*[1 2 3 4 5 6 5 4 3 2 1];
P0 = zeros(11,13);
for i = 1:11
    P0(i,1:i+2) = PX(i)*ibinom(i+1,1/2,0:i+1);
end
P = rot90(P0);
PY = fliplr(sum(P'));
disp('Answers are in X, Y, PY, P')
```

npr08_05

```
% file npr08_05.m
% Data and basic calculations for P8-5
PX = (1/36)*[1 2 3 4 5 6 5 4 3 2 1];
X = 2:12;
Y = 0:12;
P0 = zeros(11,13);
for i = 1:11
    P0(i,1:i+2) = PX(i)*ibinom(i+1,1/6,0:i+1);
end
P = rot90(P0);
PY = fliplr(sum(P'));
disp('Answers are in X, Y, P, PY')
```

npr08_06

```
% file Newprobs/pr08_06.m
% Data for problem P8-6 (from Exam 2, 95f)
P = [0.0483    0.0357    0.0420    0.0399    0.0441
      0.0437    0.0323    0.0380    0.0361    0.0399
      0.0713    0.0527    0.0620    0.0609    0.0551
      0.0667    0.0493    0.0580    0.0651    0.0589];
```

```
X = [-2.3 -0.7 1.1 3.9 5.1];
Y = [ 1.3  2.5 4.1 5.3];
disp('Data are in X, Y, P')
```

npr08_07

```
% file pr08_07.m (from Exam3, 96s)
% Data for problem P8-7
X = [-3.1 -0.5 1.2 2.4 3.7 4.9];
Y = [-3.8 -2.0 4.1 7.5];
P = [ 0.0090    0.0396    0.0594    0.0216    0.0440    0.0203;
      0.0495         0    0.1089    0.0528    0.0363    0.0231;
      0.0405    0.1320    0.0891    0.0324    0.0297    0.0189;
      0.0510    0.0484    0.0726    0.0132         0    0.0077];
disp('Data are in X, Y, P')
```

npr08_08

```
% file Newprobs/pr08_08.m (from Exam 4 96s)
% Data for problem P8-8
P = [0.0156 0.0191 0.0081 0.0035 0.0091 0.0070 0.0098 0.0056 0.0091 0.0049;
      0.0064 0.0204 0.0108 0.0040 0.0054 0.0080 0.0112 0.0064 0.0104 0.0056;
      0.0196 0.0256 0.0126 0.0060 0.0156 0.0120 0.0168 0.0096 0.0056 0.0084;
      0.0112 0.0182 0.0108 0.0070 0.0182 0.0140 0.0196 0.0012 0.0182 0.0038;
      0.0060 0.0260 0.0162 0.0050 0.0160 0.0200 0.0280 0.0060 0.0160 0.0040;
      0.0096 0.0056 0.0072 0.0060 0.0256 0.0120 0.0268 0.0096 0.0256 0.0084;
      0.0044 0.0134 0.0180 0.0140 0.0234 0.0180 0.0252 0.0244 0.0234 0.0126;
      0.0072 0.0017 0.0063 0.0045 0.0167 0.0090 0.0026 0.0172 0.0217 0.0223];

X = 1:2:19;
Y = [-5 -3 -1 3 5 9 10 12];
disp('Data are in X, Y, P')
```

npr08_09

```
% file pr08_09.m (from Exam3 95f)
% Data for problem P8-9
P = [0.0390    0.0110    0.0050    0.0010    0.0010;
      0.0650    0.0700    0.0500    0.0150    0.0100;
      0.0310    0.0610    0.1370    0.0510    0.0330;
      0.0120    0.0490    0.1630    0.0580    0.0390;
      0.0030    0.0090    0.0450    0.0250    0.0170];
X = [1 1.5 2 2.5 3];
Y = [1 2 3 4 5];
disp('Data are in X, Y, P')
```

npr09_02

```
\begin{verbatim}
% file Newprobs/npr09_02.m
% Data for problem P9-2
P = [0.0589    0.0342    0.0304    0.0456    0.0209;
      0.0961    0.0556    0.0498    0.0744    0.0341;
      0.0682    0.0398    0.0350    0.0528    0.0242;
      0.0868    0.0504    0.0448    0.0672    0.0308];
X = [-3.9 -1.7 1.5 2.8 4.1];
Y = [-2 1 2.6 5.1];
disp('Data are in X, Y, P')
\end{verbatim}
```

npr10_16

```
\begin{verbatim}
% file npr10_16.m
% Data for problem P10-16
cx = [-2 1 3 0];
pmx = 0.001*[255 25 375 45 108 12 162 18];
cy = [1 3 1 -3];
pmy = minprob(0.01*[32 56 40]);
Z = [-1.3 1.2 2.7 3.4 5.8];
PZ = 0.01*[12 24 43 13 8];
disp('Data are in cx, pmx, cy, pmy, Z, PZ')
\end{verbatim}
```

npr12_10

```
% file npr12_10.m
% Data for problems P12-10, P12_11
cx = [-3.3 -1.7 2.3 7.6 -3.4];
pmx = 0.0001*[475 725 120 180 1125 1675 280 420 480 720 130 170 1120 1680 270 430];
cy = [10 17 20 -10];
pmy = 0.01*[6 14 9 21 6 14 9 21];
disp('Data are in cx, cy, pmx and pmy')
```

npr16_07

```
\begin{verbatim}
% file npr16_07.m
% Transition matrix for problem P16-7

P = [0.23    0.32    0.02    0.22    0.21;
      0.29    0.41    0.10    0.08    0.12;
```

```
0.22    0.07    0.31    0.14    0.26;  
0.32    0.15    0.05    0.33    0.15;  
0.08    0.23    0.31    0.09    0.29];
```

```
disp('Transition matrix is P')  
\end{verbatim}
```

npr16_09

```
% file npr16_09.m  
% Transition matrix for problem P16-9  
P = [0.2 0.5 0.3 0 0 0 0;  
      0.6 0.1 0.3 0 0 0 0;  
      0.2 0.7 0.1 0 0 0 0;  
      0 0 0 0.6 0.4 0 0;  
      0 0 0 0.5 0.5 0 0;  
      0.1 0.3 0 0.2 0.1 0.1 0.2;  
      0.1 0.2 0.1 0.2 0.2 0.2 0];  
disp('Transition matrix is P')
```

This page titled [17.8: Matlab files for "Problems" in "Applied Probability"](#) is shared under a [CC BY 3.0](#) license and was authored, remixed, and/or curated by [Paul Pfeiffer](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.