Problem 1

Exercise 3.5 (p. 114) A Complex Circuit (skip part C)

```
 p = 0.8;
 q = 1-p;

%  (a)
 s1 = p; %e1

 s2a = p; %probablility that e2 works
 s2b = 1-q*q; %probability that e3 and e4 work in parallel
 s2c = 1-q*q*q; %probability that e5, e6 and e7 work in parallel
 s2 = s2a*s2b*s2c; %probability that s2a, s2b and s2c work in series

 s3 = p*p; %probability that e8 and e9 work when in series

 s4a = p*p; % probability that e12 and e13 work in series
 s4 = 1-q*(1-s4a); %probability that s4a and e11 work in parallel

 s5 = s4*p; %probability that s4 and e10 work in series

 ptotal = 1-(1-s1)*(1-s2)*(1-s3)*(1-s5);      %ptotal = 0.9956

% (b)

M=1000000;
s = 0;
for i = 1:M
e = rand(1,13) < 0.8;
% ===============
s1 = e(1);
s2b = max(e(3), e(4)); % or s2b = e3+e4>0; (parallel)
s2c = max([e(5), e(6), e(7)]);
s2 = min([e(2), s2b, s2c]);
s3 = min(e(8), e(9)); % or s3 = e8*e9; (series)
s4a = max(min(e(12), e(13)), e(11));
s4 = min(e(10), s4a);

st = max([s1, s2, s3, s4]);
s = s+st;


end
works = s/M; % works = 0.9957
fails = 1 - works; %fails = 0.0043
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Problem 2

Exercise 3.28 (p. 121) Mysterious Transfer

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% Of two bags, one contains four white balls and three black balls and the
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% other contains three white balls and five black balls. One ball is
% randomly selected from the first bag and placed unseen in the second bag.

% (a) What is the probability that a ball now drawn from the second bag
% will be black?
%  P = probability black ball was transferred*(6 black/ 9 total) +
%  probability white ball was transferred * (5 black balls / 9 total)

P = (3/7)*(6/9) + (4/7)*(5/9); % 0.6032

% (b) If the second ball is black, what is the probability that a black
% ball was transferred?

% Apply Bayes Formula
% P(A|B) = P(B|A)*P(A)/P(B) --> A: black ball was transferred, B: the
% second ball is black

PBA = 6/9; %probability that a black ball is chosen given a black ball was transfe
PA = 3/7; %probability that a black ball was transferred from bag 1 to bag 2
PB = P; %probability that the second ball is black

PAB = (PBA*PA)/PB; %0.4737
```

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