Chapter 6
Solved Problems

Problem 1

Script file:

```
clear, clc
disp('Part (a)')
12-4<5*3
disp('Part (b)')
y=8/4>6*3-4^2>-3
disp('Part (c)')
y=-3<(8-12)+2*(5>18/6-4)^2
disp('Part (d)')
(~5+~0)*6==3+3*~0
```

Command Window:

```
Part (a)
ans =
     1
Part (b)
y =
     1
Part (c)
y =
     1
Part (d)
ans =
     1
```

Problem 2

Script file:

```
clear, clc
a=-2; b=3; c=5;
disp('Part (a)')
y=a-b>a-c<b
disp('Part (b)')
y=-4<a<0
disp('Part (c)')
y=a-c<=b>a+c
disp('Part (d)')
y=3*(c+a~=a/b-b)==(a+c)~=b
```

Command Window:

```
Part (a)
y =
     1
Part (b)
y =
     0
Part (c)
y =
     0
Part (d)
y =
     1
```

Problem 3

Script file:

```
clear, clc
v=[4 -1 2 3 1 -2 5 0]; u=[5 -1 0 3 -3 2 1 5];
disp('Part (a)')
~~u
disp('Part (b)')
v==~u
disp('Part (c)')
u==abs(v)
disp('Part (d)')
v>=u+v
```

Command Window:

```
Part (a)

ans =

     1     1     0     1     1     1     1     1

Part (b)

ans =

     0     0     0     0     0     0     0     1

Part (c)

ans =

     0     0     0     1     0     1     0     0

Part (d)

ans =

     0     1     1     0     1     0     0     0
```

Problem 4

Script file:

```
clear, clc
v=[4 -1 2 3 1 -2 5 0]; u=[5 -1 0 3 -3 2 1 5];
w=u.*(u<=v)
disp('or')
w=u(u<=v)
```

Command Window:

```
w =
     0    -1     0     3    -3     0     1     0
or
w =
    -1     0     3    -3     1
```

Problem 5

Script file:

```
clear, clc
disp('Part (a)')
-3&3
disp('Part (b)')
~5<4&~0>-3
disp('Part (c)')
-2&2>3|8/3
disp('Part (d)')
-3<-1<~0|5<4<3
```

Command Window:

```
Part (a)
ans =
     1
Part (b)
ans =
     1
Part (c)
ans =
     1
Part (d)
ans =
     1
```

Problem 6

Script file:

```
clear, clc
for j=1:3
    for k=1:5
        matrix(j,k)=j^k/(j+k);
    end
end
matrix
```

Command Window:

```
matrix =
    0.5000    0.3333    0.2500    0.2000    0.1667
    0.6667    1.0000    1.6000    2.6667    4.5714
    0.7500    1.8000    4.5000   11.5714   30.3750
```

Problem 7

Script file:

```
clear
n=input('Please enter the size of the Pascal matrix to be created: ');
for i=1:n
    for j=1:n
        A(i,j)=factorial(i+j-2)/(factorial(i-1)*factorial(j-1));
    end
end
A
```

Command Window:

```
Please enter the size of the Pascal matrix to be created: 4
A =
     1     1     1     1
     1     2     3     4
     1     3     6    10
     1     4    10    20
>> PascalMatrix
Please enter the size of the Pascal matrix to be created: 7
A =
     1     1     1     1     1     1     1
     1     2     3     4     5     6     7
     1     3     6    10    15    21    28
     1     4    10    20    35    56    84
     1     5    15    35    70   126   210
     1     6    21    56   126   252   462
     1     7    28    84   210   462   924
```

Problem 8

Script file:

```
clear, clc
BOS=[2.67 1.00 1.21 3.09 3.43 4.71 3.88 3.08 4.10 2.62 1.01 5.93];
SEA=[6.83 3.63 7.20 2.68 2.05 2.96 1.04 0.00 0.03 6.71 8.28 6.85];
disp('Part (a)')
B_T=sum(BOS);
B_A=mean(BOS);
S_T=sum(SEA);
S_A=mean(SEA);
fprintf('The total precipitation in Boston in 2012 was %.2f in',B_T)
fprintf(' and average %.2f in\n',B_A)
fprintf('The total precipitation in Seattle in 2012 was %.2f in',S_T)
fprintf(' and average %.2f in\n\n',S_A)
disp('Part (b)')
B_D=sum(BOS>B_A);
S_D=sum(SEA>S_A);
fprintf('Boston had %i months above average and Seattle %i
months\n\n',B_D,S_D)
disp('Part (c)')
BltS=sum(BOS<SEA);
m=1:12;
fprintf('The precipitation was lower in Boston in the following %i
months:',BltS)
fprintf(' %i',m(BOS<SEA))
fprintf('\n')
```

Command Window:

```
Part (a)
The total precipitation in Boston in 2012 was 36.73 in and average 3.06 in
The total precipitation in Seattle in 2012 was 48.26 in and average 4.02 in

Part (b)
Boston had 7 months above average and Seattle 5 months

Part (c)
The precipitation was lower in Boston in the following 6 months: 1 2 3 10 11
12
```

Problem 9

Script file:

```
clear, clc
i=0;
s=0;
while s<=120
    i=i+1;
    if rem(i,2)==0 && rem(i,13)==0 && rem(i,16)==0
        s=sqrt(i);
    end
end
fprintf('The required number is: %i\n',i)
```

Command Window:

```
The required number is: 14560
```

Problem 10

Script file:

```
clear, clc
f(1)=0; f(2)=1;
for k=1:18
    f(k+2)=f(k)+f(k+1);
end
fprintf('The first 20 Fibonacci numbers are:\n')
fprintf(' %i',f)
fprintf('\n')
```

Command Window:

```
The first 20 Fibonacci numbers are:

 0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181
```

Problem 11

Script file:

```
clear, clc
n=[10 50 100];
f(1)=1; f(2)=1;
for j=1:3
    S=2;
    for k=3:n(j)
        f(k)=f(k-1)+f(k-2);
        S=S+1/f(k);
    end
    fprintf('The sum after %i terms is: %.12f\n',n(j),S)
end
```

Command Window:

```
The sum after 10 terms is: 3.330469040763
The sum after 50 terms is: 3.359885666115
The sum after 100 terms is: 3.359885666243
```

Problem 12

Script file:

```
clear, clc
for k=1:3
    disp('For the equation ax^2+bx+c')
    a=input('Enter a: ');
    b=input('Enter b: ');
    c=input('Enter c: ');
    D=b^2-4*a*c;
    if D<0
        fprintf('\nThe equation has no real roots.\n\n')
    elseif D==0
        root=-b/(2*a);
        fprintf('\nThe equation has one root,\n')
        fprintf(' %.3f\n\n',root)
    else
        r1=(-b+sqrt(D))/(2*a);
        r2=(-b-sqrt(D))/(2*a);
        fprintf('\nThe equation has two roots,\n')
        fprintf(' %.3f and %.3f\n\n',r1,r2)
    end
end
```

Command Window:

```
For the equation ax^2+bx+c
Enter a: 3
Enter b: 6
Enter c: 3

The equation has one root,
 -1.000

For the equation ax^2+bx+c
Enter a: -3
Enter b: 4
Enter c: -6

The equation has no real roots.

For the equation ax^2+bx+c
Enter a: -3
Enter b: 7
Enter c: 5

The equation has two roots,
 -0.573 and 2.907
```

Problem 13

Script file:

```
clear, clc
format long
n=[100 10000 1000000];
for j=1:3
    S=0;
    for k=1:n(j)
        S=S+1/k^2;
    end
    Est(j)=sqrt(6*S);
end
disp('pi =')
disp(pi)
disp('Sums for 100, 10000, and 1000000 terms are:')
for j=1:3
    disp(Est(j))
end
```

Command Window:

```
pi =
   3.141592653589793
Sums for 100, 10000, and 1000000 terms are:
   3.132076531809105
   3.141497163947215
   3.141591698660509
```

Problem 14

Script file:

```
clear, clc
format long
n=[5 10 40];
for j=1:3
    t(1)=sqrt(2)/2;
    T=t(1);
    for k=2:n(j)
        t(k)=sqrt(2+2*t(k-1))/2;
        T=T*t(k);
    end
    Est(j)=2/T;
end
disp('pi =')
disp(pi)
disp('Results for 5, 10, and 40 terms are:')
for j=1:3
    disp(Est(j))
end
```

Command Window:

```
pi =
   3.141592653589793
Results for 5, 10, and 40 terms are:
   3.140331156954753
   3.141591421511200
   3.141592653589794
```

Problem 15

Script file:

```
clear, clc
vector=20*rand(1,20)-10;
S=0;
for k=1:20
    if(vector(k)>0)
        S=S+vector(k);
    end
end
disp('The sum of the positive elements is: ')
disp(S)
```

Command Window:

```
The sum of the positive elements is:

   52.5755
```

Problem 16

Script file:

```
clear, clc
vector=randi(20,1,20)-10;
iter=0;
N=-1;
while N<0
    N=1;
    for k=1:20
        if vector(k)<0
            N=-1;
            vector(k)=randi(20)-10;
        end
    end
    if N == -1
        iter=iter+1;
    end
end
vector
disp('The number of iterations needed to make all elements of vector
positive')
disp(iter)
```

Command Window:

```
vector =

     3     4     5     6     1     2     5     2     4     7     7     5
8     0     2     6     5     0     4     9

The number of iterations needed to make all elements of vector positive

     4
```

Problem 17

Script file:

```
vector=input('Please enter any array of integers of any length: ')
n=0; np=0; nn3=0;
for k=1:length(vector)
    n=n+1;
    if vector(k)>0
        np=np+1;
    elseif vector(k)<0 & rem(vector(k),3)==0
        nn3=nn3+1;
    end
end
fprintf('The vector has %i elements.  %i elements are positive\n',n,np)
fprintf('and %i elements are negative divisible by 3\n',nn3)
```

Command Window:

```
Please enter any array of integers of any length: randi([-20 20],1,16)
vector =
    15   -16    17   -16     1   -15     2   -20    11    14    17    20
0    -9   -16     0
The vector has 16 elements.  8 elements are positive
and 2 elements are negative divisible by 3
```

Problem 18

Script file:

```
clear, clc
x=[4.5 5 -16.12 21.8 10.1 10 -16.11 5 14 -3 3 2];
for k=1:length(x)-1
    for j=k+1:length(x)
        if x(j)<x(k)
           temp=x(k);
           x(k)=x(j);
           x(j)=temp;
        end
    end
end
x
```

Command Window:

```
x =

  Columns 1 through 8

  -16.1200  -16.1100   -3.0000    2.0000    3.0000    4.5000    5.0000
5.0000

  Columns 9 through 12

   10.0000   10.1000   14.0000   21.8000
```

Problem 19

Script file:

```
clear, clc
id=1;
for k=1:50
    for j=k+1:50
        for i=j+1:50
            if i^2==k^2+j^2
                a(id)=k;
                b(id)=j;
                c(id)=i;
                id=id+1;
            end
        end
    end
end
table=[a' b' c']
```

Command Window:

```
table =
     3     4     5
     5    12    13
     6     8    10
     7    24    25
     8    15    17
     9    12    15
     9    40    41
    10    24    26
    12    16    20
    12    35    37
    14    48    50
    15    20    25
    15    36    39
    16    30    34
    18    24    30
    20    21    29
    21    28    35
    24    32    40
    27    36    45
    30    40    50
```

Problem 20

Script file:

```
clear, clc
id=1;
k=11;
while k<498
    j=3;
    isprime=1;
    while j<=sqrt(k)
        if rem(k,j)==0
            isprime=0;
            break
        end
        j=j+2;
    end
    if isprime
        kp2=k+2;
        j=3;
        isprime2=1;
        while j<=sqrt(kp2)
            if rem(kp2,j)==0
                isprime2=0;
                break
            end
            j=j+2;
        end
        if isprime2
            P(id)=k;
            P2(id)=kp2;
            id=id+1;
        end
    end
    k=k+2;
end
table=[P' P2']
```

Command Window:

```
table =
    11    13
    17    19
    29    31
    41    43
    59    61
    71    73
   101   103
   107   109
   137   139
   149   151
   179   181
   191   193
```

197 199
227 229
239 241
269 271
281 283
311 313
347 349
419 421
431 433
461 463

Problem 21

Script file:

```
clear, clc
id=1;
for k=49:2:101
    j=3;
    isprime=1;
    while j<=sqrt(k)
        if rem(k,j)==0
            isprime=0;
            break
        end
        j=j+2;
    end
    if isprime
        P(id)=k;
        id=id+1;
    end
end
id=1;
for k=2:length(P)-1
    if P(k+1)~=P(k)+2 & P(k-1)~=P(k)-2
        iso(id)=P(k);
        id=id+1;
    end
end
disp('The isolated primes between 50 and 100 are:')
disp(iso)
```

Command Window:

```
The isolated primes between 50 and 100 are:

    67    79    83    89    97
```

Problem 22

Script file:

```
scores=[31 70 92 5 47 88 81 73 51 76 80 90 55 23 43 98 36 ...
    87 22 61 19 69 26 82 89 99 71 59 49 64];
n(1:5)=0;
for k=1:length(scores)
    if scores(k)<20
        n(1)=n(1)+1;
    elseif scores(k)<40
        n(2)=n(2)+1;
    elseif scores(k)<60
        n(3)=n(3)+1;
    elseif scores(k)<80
        n(4)=n(4)+1;
    else
        n(5)=n(5)+1;
    end
end
fprintf('Grades between  0 and  19 %3i students\n',n(1))
fprintf('Grades between 20 and  39 %3i students\n',n(2))
fprintf('Grades between 40 and  59 %3i students\n',n(3))
fprintf('Grades between 60 and  79 %3i students\n',n(4))
fprintf('Grades between 80 and 100 %3i students\n',n(5))
```

Command Window:

```
Grades between  0 and  19   2 students
Grades between 20 and  39   5 students
Grades between 40 and  59   6 students
Grades between 60 and  79   7 students
Grades between 80 and 100  10 students
```

Problem 23

Script file:

```
clear, clc
for j=1:2
    angle=input('Please input an angle in degrees: ');
    x=angle*pi/180;
    E=1; S=0; k=0;
    while E>.000001
        S_old=S;
        S=S+(-1)^k/factorial(2*k)*x^(2*k);
        E=abs((S-S_old)/S_old);
        k=k+1;
    end
    fprintf('\nThe value of cosine of %.0f degrees is %.8f\n\n',angle,S)
end
```

Command Window:

```
Please input an angle in degrees: 35

The value of cosine of 35 degrees is 0.81915205

Please input an angle in degrees: 125

The value of cosine of 125 degrees is -0.57357644
```

Problem 24

Script file:

```
clear, clc
k=1; S=1;
while S<1000
    S=k*(k+1)/2;
    d1=floor(S/100);
    d2=floor((S-d1*100)/10);
    d3=floor(S-d1*100-d2*10);
    if d1==d2 & d2==d3
        break
    end
    k=k+1;
end
fprintf('The desired sum is %i\n', S)
fprintf('This is the sum of the first %i digits\n',k)
```

Command Window:

```
The desired sum is 666

This is the sum of the first 36 digits
```

Problem 25

Script file:

```
clear, clc
for k=1:2
    gender=input('Please input your gender (male or female): ','s');
    age=input('Please input your age: ');
    RHR=input('Please enter your resting heart rate: ');
    fit=input('Please enter your fitness level (low, medium, or high: ','s');
    gender = lower(gender);
    fit = lower(fit);
    switch fit
        case 'low'
            INTEN=0.55;
        case 'medium'
            INTEN=0.65;
        case 'high'
            INTEN=0.8;
    end
    switch gender
        case 'male'
            THR=((220-age)-RHR)*INTEN+RHR;
        case 'female'
            THR=((206-0.88*age)-RHR)*INTEN+RHR;
    end
    fprintf('\nThe recommended training heart rate is %.0f\n\n',THR)
end
```

Command Window:

```
Please input your gender (male or female): male
Please input your age: 21
Please enter your resting heart rate: 62
Please enter your fitness level (low, medium, or high: low

The recommended training heart rate is 137

Please input your gender (male or female): female
Please input your age: 19
Please enter your resting heart rate: 67
Please enter your fitness level (low, medium, or high: high

The recommended training heart rate is 165
```

Problem 26

Script file:

```
clear, clc
for j=1:2
    W=input('Please input your weight in lb: ');
    h=input('Please input your height in in: ');
    BMI=703*W/h^2;
    if BMI<18.5
        fprintf('\nYour BMI value is %.1f, which classifies you as
underweight\n\n',BMI)
    elseif BMI<25
        fprintf('\nYour BMI value is %.1f, which classifies you as
normal\n\n',BMI)
    elseif BMI<30
        fprintf('\nYour BMI value is %.1f, which classifies you as
overweight\n\n',BMI)
    else
        fprintf('\nYour BMI value is %.1f, which classifies you as
obese\n\n',BMI)
    end
end
```

Command Window:

```
Please input your weight in lb: 180
Please input your height in in: 74

Your BMI value is 23.1, which classifies you as normal

Please input your weight in lb: 150
Please input your height in in: 61

Your BMI value is 28.3, which classifies you as overweight
```

Problem 27

Script file:

```
clear, clc
for j=1:3
    service=input('Please input the type of service\n G for Ground, E for
Express, O for Overnight: ','s');
    wt=input('Please enter the weight of the package as [lb oz]: ');
    service = lower(service);
    wgt=wt(1)+wt(2)/16;
    switch service
        case 'g'
            if wgt<0.5
                cost=.7+.06*wt(2);
            elseif wgt<5
                u=ceil(2*(wgt-0.5));
                cost=1.18+.42*u;
            else
                cost=4.96+.72*ceil(wgt-5);
            end
        case 'e'
            if wgt<0.5
                cost=2.4+.25*wt(2);
            elseif wgt<5
                u=ceil(2*(wgt-0.5));
                cost=4.40+1.2*u;
            else
                cost=15.2+1.8*ceil(wgt-5);
            end
        case 'o'
            if wgt<0.5
                cost=12.20+.8*wt(2);
            elseif wgt<5
                u=ceil(2*(wgt-0.5));
                cost=18.6+4.8*u;
            else
                cost=61.8+6.4*ceil(wgt-5);
            end
    end
    fprintf('\nThe cost of service will be $%.2f\n\n',cost)
end
```

Command Window:

```
Please input the type of service
 G for Ground,E for Express, O for Overnight: G
Please enter the weight of the package as [lb oz]: [2 7]

The cost of service will be $2.86

Please input the type of service
 G for Ground,E for Express, O for Overnight: E
Please enter the weight of the package as [lb oz]: [0 7]
```

```
The cost of service will be $4.15

Please input the type of service
 G for Ground,E for Express, O for Overnight: O
Please enter the weight of the package as [lb oz]: [5 10]

The cost of service will be $68.20
```

Problem 28

Script file:

```
clear, clc
for j=1:3
    n(1:8)=0;
    cost=randi([1 5000],1,1)/100;
    fprintf('The total charge is $%.2f\n',cost)
    pay=input('Please enter payment (1, 5, 10, 20, or 50): ');
    if pay<cost
        fprintf('Insufficient Payment\n\n')
        continue
    else
        change=pay-cost;
        if change>=20
            n(1)=1;
            change=change-20;
        end
        if change>=10
            n(2)=1;
            change=change-10;
        end
        if change>=5
            n(3)=1;
            change=change-5;
        end
        while change>=1
            n(4)=n(4)+1;
            change=change-1;
        end
        while change>=.25
            n(5)=n(5)+1;
            change=change-.25;
        end
        while change>=.10
            n(6)=n(6)+1;
            change=change-.10;
        end
        if change>=.05
            n(7)=1;
            change=change-.05;
        end
        change=change+.000001;
        while change>=.01
            n(8)=n(8)+1;
            change=change-.01;
        end
    end
    fprintf('\n   $20   $10    $5    $1  $0.25 $0.10 $0.05 $0.01\n')
    fprintf('     %i',n)
    fprintf('\n\n')
end
```

Command Window:

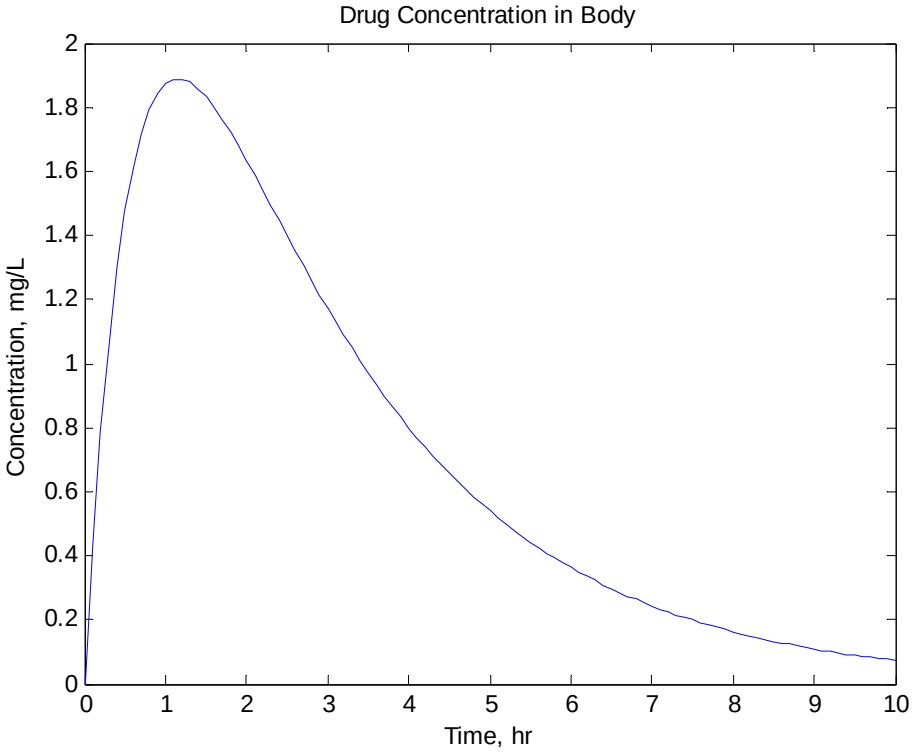
```
The total charge is $44.39
Please enter payment (1, 5, 10, 20, or 50): 50

   $20   $10    $5    $1  $0.25 $0.10 $0.05 $0.01
     0     0     1     0     2     1     0     1

The total charge is $9.94
Please enter payment (1, 5, 10, 20, or 50): 50

   $20   $10    $5    $1  $0.25 $0.10 $0.05 $0.01
     1     1     1     5     0     0     1     1

The total charge is $19.77
Please enter payment (1, 5, 10, 20, or 50): 5
Insufficient Payment
```

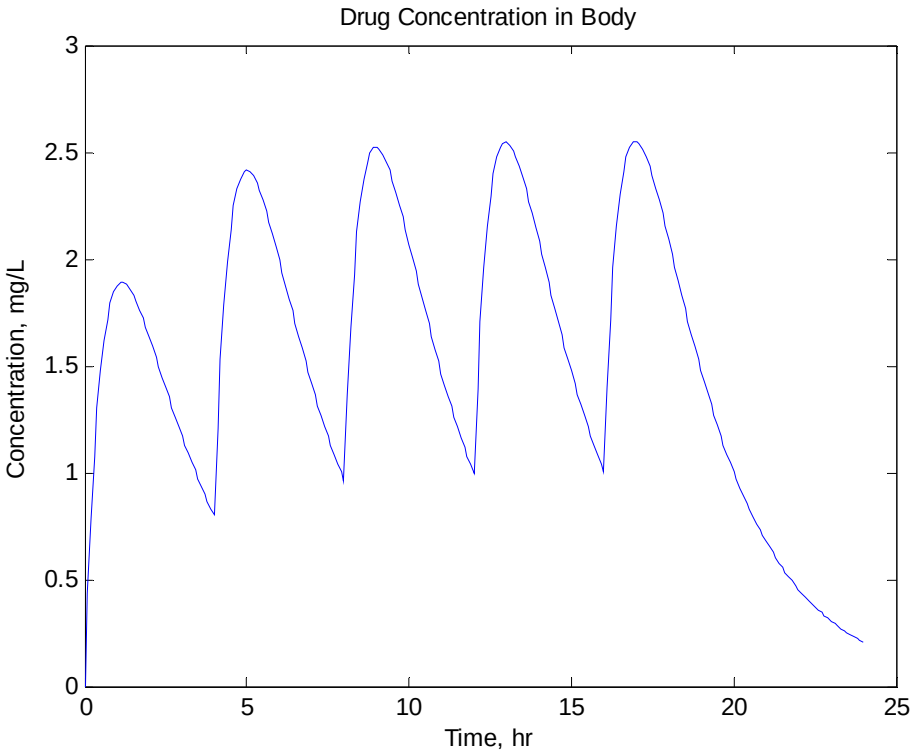
Problem 29

Script file:

```
Dg=150; vd=50; ka=1.6; ke=0.4;
% disp('Part (a)')
figure(1)
t=0:.1:10;
Cp=Dg/vd*ka*(exp(-ke*t)-exp(-ka*t))/(ka-ke);
plot(t,Cp)
title('Drug Concentration in Body')
xlabel('Time, hr')
ylabel('Concentration, mg/L')
% disp('Part (b)')
figure(2)
t=0:.1:24;
Cp=Dg/vd*ka*(exp(-ke*t)-exp(-ka*t))/(ka-ke);
Net(1:40)=Cp(1:40);
Net(41:80)=Cp(41:80)+Cp(1:40);
Net(81:120)=Cp(81:120)+Cp(41:80)+Cp(1:40);
Net(121:160)=Cp(121:160)+Cp(81:120)+Cp(41:80)+Cp(1:40);
Net(161:241)=Cp(161:241)+Cp(121:201)+Cp(81:161)+Cp(41:121)+Cp(1:81);
plot(t,Net)
title('Drug Concentration in Body')
xlabel('Time, hr')
ylabel('Concentration, mg/L')
```

Figure Windows:





Problem 30

Script file:

```
clear, clc
n=[100 53701 19.35];
for j=1:3
    P=n(j);
    x=P;
    E=1;
    while E>.00001
        x_old=x;
        x=(P/x^2+2*x)/3;
        E=abs((x-x_old)/x_old);
    end
    fprintf('The cube root of %.0f is %.1f\n',P,x)
end
```

Command Window:

```
The cube root of 100 is 4.6
The cube root of 53701 is 37.7
The cube root of 19 is 2.7
```

Problem 31

Script file:

```
clear, clc
for j=1:3
    p=input('Please enter the pressure: ');
    old=input('Please enter the units (Pa, psi, atm, or torr): ','s');
    new=input('Please enter the desired units (Pa, psi, atm, or torr):
','s');
    switch old
        case 'Pa'
            temp=p;
        case 'psi'
            temp=6.894757e03*p;
        case 'atm'
            temp=1.01325e05*p;
        case 'torr'
            temp=1.333224e02*p;
    end
    switch new
        case 'Pa'
            pnew=temp;
        case 'psi'
            pnew=temp/6.894757e03;
        case 'atm'
            pnew=temp/1.01325e05;
        case 'torr'
            pnew=temp/1.333224e02;
    end
    fprintf('The converted pressure is %.1f %s\n\n',pnew,new)
end
```

Command Window:

```
Please enter the pressure: 70
Please enter the units (Pa, psi, atm, or torr): psi
Please enter the desired units (Pa, psi, atm, or torr): Pa
The converted pressure is 482633.0 Pa

Please enter the pressure: 120
Please enter the units (Pa, psi, atm, or torr): torr
Please enter the desired units (Pa, psi, atm, or torr): atm
The converted pressure is 0.2 atm

Please enter the pressure: 8000
Please enter the units (Pa, psi, atm, or torr): Pa
Please enter the desired units (Pa, psi, atm, or torr): psi
The converted pressure is 1.2 psi
```

Problem 32

Script file:

```
clear, clc
for k=1:100
    x=0;
    n(k)=0;
    while abs(x)<10
        x=x+randn(1,1);
        n(k)=n(k)+1;
    end
end
fprintf('The average number of steps to reach the boundary are
%.1f\n',mean(n))
```

Command Window:

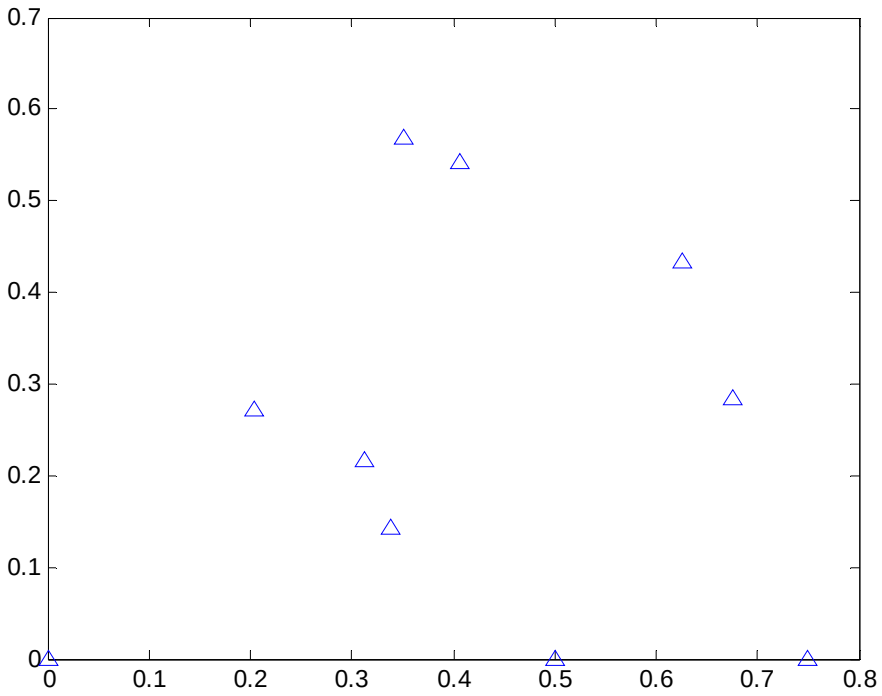
```
The average number of steps to reach the boundary are 119.0
```

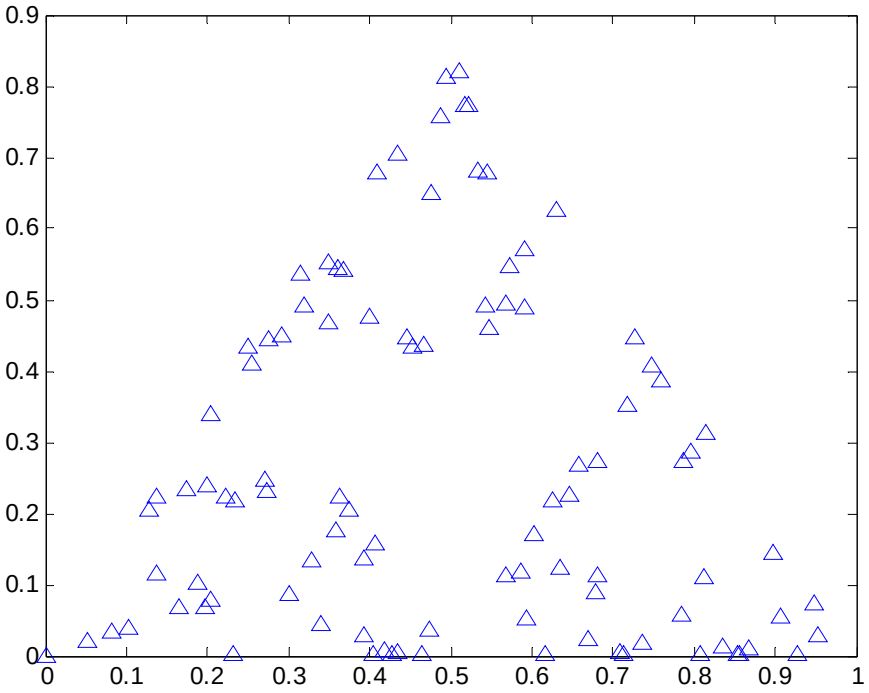
Problem 33

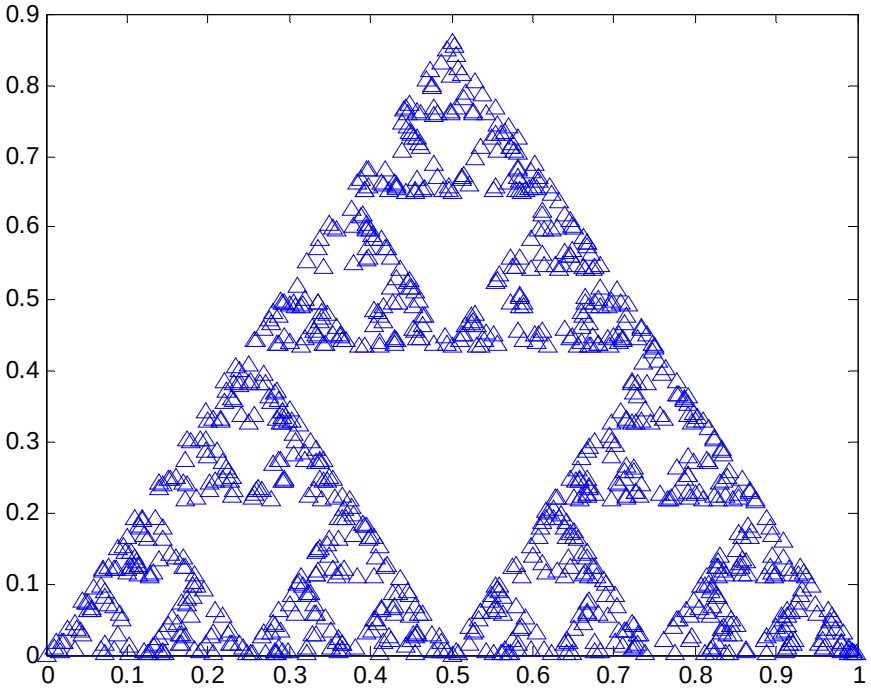
Script file:

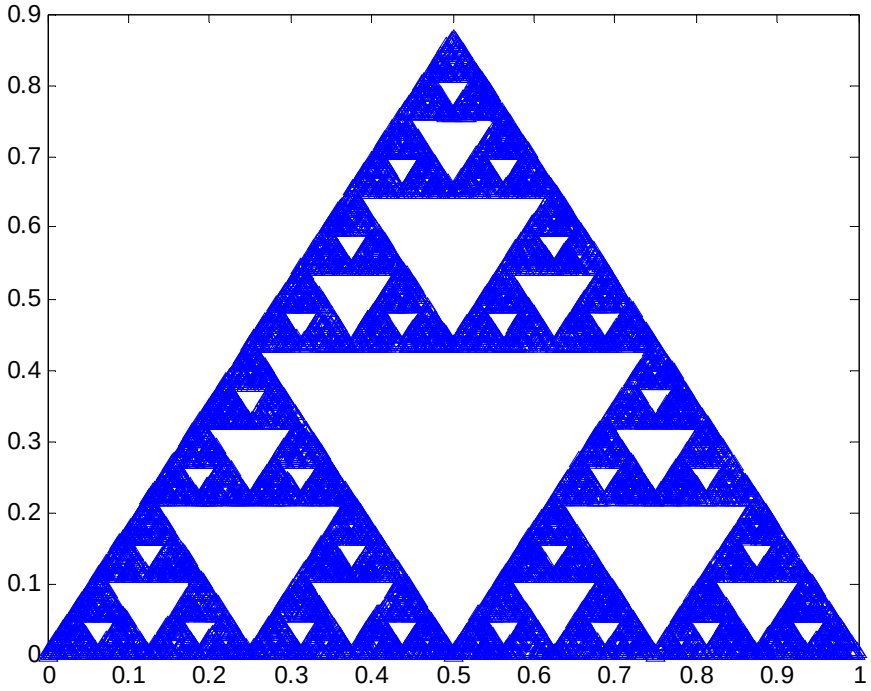
```
n=[10 100 1000 10000];
for j=1:4
    x(1)=0; y(1)=0;
    for k=2:n(j)
        m=randi([1 3],1,1);
        switch m
            case 1
                x(k)=0.5*x(k-1);
                y(k)=0.5*y(k-1);
            case 2
                x(k)=0.5*x(k-1)+0.25;
                y(k)=0.5*y(k-1)+sqrt(3)/4;
            case 3
                x(k)=0.5*x(k-1)+0.5;
                y(k)=0.5*y(k-1);
        end
    end
    figure(j)
    plot(x,y,'^')
end
```

Figure Windows:




0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

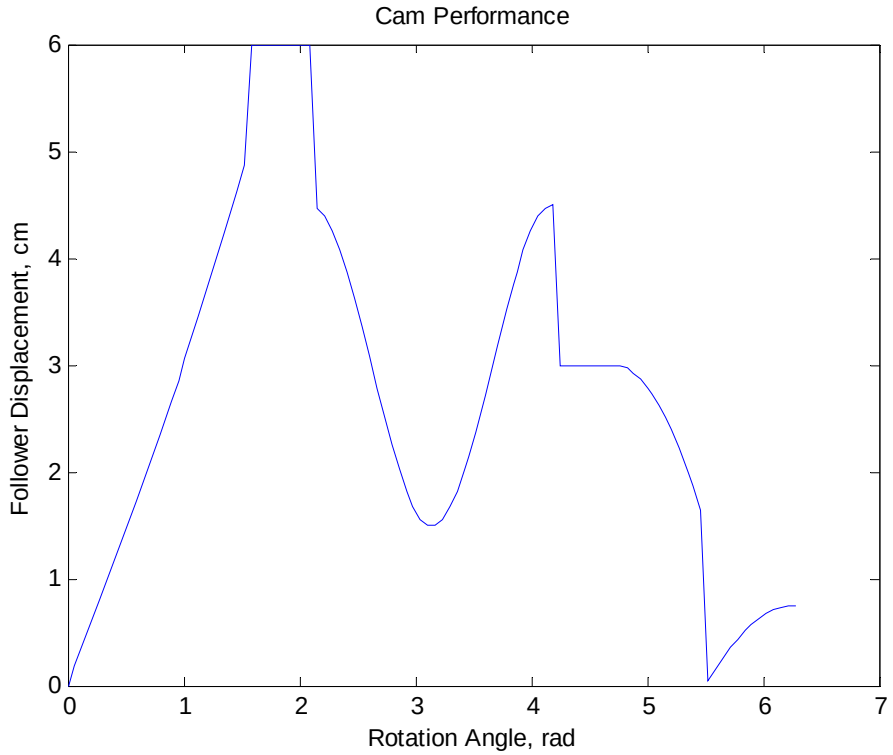

0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Problem 34

Script file:

```
theta=linspace(0,2*pi,100)
for k=1:100
    if theta(k)<=pi/2
        y(k)=6*(2*theta(k)-0.5*sin(theta(k)))/pi;
    elseif theta(k)<=2*pi/3
        y(k)=6;
    elseif theta(k)<=4*pi/3
        y(k)=6-3*(1-0.5*cos(3*(theta(k)-2*pi/3)));
    elseif theta(k)<=3*pi/2
        y(k)=3;
    elseif theta(k)<=7*pi/4
        y(k)=3-1.5*((theta(k)-3*pi/2)/(pi/4))^2;
    else
        y(k)=0.75-0.75*(1-(theta(k)-7*pi/4)/(pi/4))^2;
    end
end
plot(theta,y)
title('Cam Performance')
xlabel('Rotation Angle, rad')
ylabel('Follower Displacement, cm')
```

Figure Window:



Problem 35

Script file:

```
clear, clc
for j=1:2
quiz=input('Please enter the quiz grades as a vector [x x x x x x]: ');
mid=input('Please enter the midterm grades as a vector [x x x]: ');
final=input('Please enter the final exam grade: ');
q_c=(sum(quiz)-min(quiz))/5;
if mean(mid)>final
    grade=3*q_c + 0.5*mean(mid) + 0.2*final;
else
    grade=3*q_c + 0.2*mean(mid) + 0.5*final;
end
if grade>=90
    letter='A';
elseif grade>=80
    letter='B';
elseif grade>=70
    letter='C';
elseif grade>=60
    letter='D';
else
    letter='E';
end
fprintf('\nThe overall course grade is %.1f for a letter grade of
%s\n\n',grade,letter)
end
```

Command Window:

```
Please enter the quiz grades as a vector [x x x x x x]: [6 10 6 8 7 8]
Please enter the midterm grades as a vector [x x x]: [82 95 89]
Please enter the final exam grade: 81

The overall course grade is 83.9 for a letter grade of B

Please enter the quiz grades as a vector [x x x x x x]: [9 5 8 8 7 6]
Please enter the midterm grades as a vector [x x x]: [78 82 75]
Please enter the final exam grade: 81

The overall course grade is 79.0 for a letter grade of C
```

Problem 36

Script file:

```
clear, clc
for j=1:2
    disp(' ')
    mat=input('Please enter the golfer''s rounds as a table: ');
    [n,m]=size(mat);
    hcp=113*(mat(:,3)-mat(:,1))./mat(:,2);
    if n>=20
        N=10;
    elseif n==19
        N=9;
    elseif n==18
        N=8;
    elseif n==17
        N=7;
    elseif n>=15
        N=6;
    elseif n>=13
        N=5;
    elseif n>=11
        N=4;
    elseif n>=9
        N=3;
    elseif n>=7
        N=2;
    else
        N=1;
    end
    for k=1:n-N
        [mval id]=max(hcp);
        hcp(id)=[];
    end
    Players_handicap=floor(10*mean(hcp))/10
end
```

Command Window:

```
Please enter the golfer's rounds as a table: [71.6 122 85; 72.8 118 87;
69.7 103 83; 70.3 115 81; 70.9 116 79; 72.3 117 91; 71.6 122 89;
70.3 115 83; 72.8 118 92; 70.9 109 80; 73.1 132 94; 68.2 115 78;
74.2 135 103; 71.9 121 84]
Players_handicap =
    9.7000

Please enter the golfer's rounds as a table: [72.2 119 71; 71.6 122 73;
74 139 78; 68.2 125 69; 70.2 130 74; 69.6 109 69; 66.6 111 74]
Players_handicap =
   -0.9000
```