1 Problem 1

```
clear;clc;

A = [112 222 33 44 55 66 77 88 99];
N = numel(A);

% Initialize
sum1 = 0; sum2 = 0;
x1 = 0; x2 = 0;
Count = 1;

% For Loop
for i = 1:N
   sum1 = sum1 +A(i); % Sum of A
end

% Calculation
mean1 = sum1/N;

% For Loop
for i = 1:N
    x1 = x1 + (A(i) - mean1)^2; % Summation portion
end

% Calculation
std1 = sqrt(x1/(N-1));

% Displays %
disp(['Mean of k = ' num2str(mean1)])
disp(['Standard Deviation of k = ' num2str(std1)])

% While Loop
while Count <= N
    sum2 = sum2 +A(Count); % Sum of A
    Count = Count +1;
end

% Calculation
mean2 = sum2/N;

% While Loop
while Count > 1
% Using same counter so I don't have to initialize new count
%   (Count = N+1 to start)
% Only to be done in very specific cases where the while loops are meant to
```

```
% run for the same amount of time
    x2 = x2 + (A(Count-1) - mean1)^2; % Summation portion
    Count = Count -1;
end

std2 = sqrt(x2/(N-1));

% Displays %
disp(['Mean of k = ' num2str(mean2)])
disp(['Standard Deviation of k = ' num2str(std2)])
```

2 Problem 2

```
clear;clc;

% Hard Coded Values
N = 6;
f = zeros(N+1,1); % Why did I use N+1?
f(1) = 0; f(2) = 1; % Can start with first two values being 1

% For Loop
for k = 3:N+1 % why 3:N+1?
     f(k) = f(k-2) + f(k-1);
end

disp(num2str(f(2:N+1)));
```

3 Problem 3

```
clear;clc;

% Hard Coded Values
N = 10;
F1 = 1; % why?
F2 = 1; % why?
k = 0;

% For Loop
for a = 1:N
    F1 = F1*a;
end
% Am I calculating N*(N-1)*...*1 or 1*2*...*N?
% Obviously I can do either method. How can I do the opposite of
% what I am doing?

% Display
disp(['The factorial of 10 is equal to ' num2str(F1)])

% While Loop
while k < N
    k = k + 1;
    F2 = F2*k;
end
% Am I calculating N*(N-1)*...*1 or 1*2*...*N?
% Obviously I can do either method. How can I do the opposite of
% what I am doing?

% Display
disp (['The factorial of 10 is equal to ' num2str(F2)])
```

4 Problem 4

```
clear;clc;

% Velocity(V0) in m/s
% Positions(x&y) in m
% Theta in degrees
% Time (T) in s
% Gravity (g) is = -9.8 m/s^2

% Hard Coded Values
V0 = 100;
Theta = 25;
g = -9.8;
T(1) = 0;
y(1) = 0;
x(1) = 0;
Count = 1;

% While Loop
while y >= 0
    Count = Count + 1;
    T(Count) = T(Count - 1) + .1;
    y(Count) = V0*sind(Theta)*T(Count) + .5*g*T(Count)^2;
    x(Count) = V0*cosd(Theta)*T(Count);
end

% Displays
T = table(T',x',y','VariableNames',{'Time_s','x_m','y_m'});
disp(T);
```