HW1

Problem I (Pb 1.2)

C = a^2 for a < 5
C = a + 5 for 5 <= a < 7
C = a for a >= 7

Solution:
Using the method of if statement we write the routine below and save it as an M-file and run it from the Matlab command prompt.

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%a routine to solve the problem using the if statement
method
for a=1:10
    if(a<3)
        c(a)=a.^2;
    elseif (3<=a & a<7)
        c(a)=a+5;
    else
        c(a)=a;
    end
end
stem(c);
title('Problem 1.2, if statement method');
xlabel('index of the c array');
ylabel('value of c');
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

Using the method of the Boolean alternative expression we can just execute the commands below:

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%a routine to solve the problem using the Boolean
%expression method
a=1:10;
c=(3<= a & a<7).*(a+5) + (a<3).*a.^2 + (a>=7).*a;
stem(c);
title('Problem 1.2,  Boolean expression method');
xlabel('index of the c array');
ylabel('value of c');
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

Problem II
Study the serie below:

$$S1 = \sum_{n=1}^{n=\infty} \frac{1}{n}$$

Solution:
Below are 2 Matlab routine to create the series given above. We consider infinity is 100, however we can go for larger value for n.

First routine:

```
%using the built-in function cumsum
clear;
n=[1:100];
s=cumsum(1./n);
plot(n,s);
title('This Series is divergent')
ylabel('Series s')
xlabel('index')
```

Second routine:

```
%using the for loop
clear;
s(1)=1;nv(1)=1;
for n=2:100
   s(n)=s(n-1)+1/n;
   nv(n)=n;
end

plot(nv,s);
title('This Series is divergent ')
ylabel('Series s')
xlabel('index')
```