User Defiend Functions

```
function chk_value(sum1,sum2)
    if sum1==sum2
        fprintf('\n your guess formula is right \n')
    else
        fprintf('\n your guess formula is wrong \n')
    end
end

function return_value = sum_of_pwrs(n,pwr)
    sum1 = 0;
    for i = 1:length(n)
        sum1=sum1+((n(i)).^pwr);
    end
    return_value = sum1;
end
```

Q1: Program to find sum of first n positive integers

```
clear;
clc;

n = input('enter the value of n :\n');
na = 1:n;

sum1=sum_of_pwrs(na,1);
fprintf('\n sum from the for_loop is %d', sum1 );
```

```
 sum from the for_loop is 15
```

```
sum2=n*(n+1)/2;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

```
 sum from the guessed formula is   15
```

```
chk_value(sum1,sum2)
```

```
 your guess formula is right
```

Q2: Program to find sum of squares of first n positive integer

```
clear;
clc;


n = input('enter the value of n :\n');
na = 1:n;

sum1=sum_of_pwrs(na,2);
```

```
fprintf('\n sum from the for_loop is %d', sum1 );
```

 sum from the for_loop is 55

```
sum2=n*(n+1)*(2*n+1)/6;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

 sum from the guessed formula is   55

```
chk_value(sum1,sum2)
```

 your guess formula is right

Q3: Program to find sum of cubes of first n positive integers

```
clear;
clc;


n = input('enter the value of n :\n');
na = 1:n;

sum1=sum_of_pwrs(na,3);
fprintf('\n sum from the for_loop is %d', sum1 );
```

 sum from the for_loop is 225

```
sum2=(n^2)*(n+1)^2/4;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

 sum from the guessed formula is   225

```
chk_value(sum1,sum2)
```

 your guess formula is right

Q4 Guess a formula for the following and write a program to check whether your guessed formula is correct

(a)sum of first n odd positive integers

```
clear;
clc;


n = input('enter the value of n :\n');
na = 1:2:(2*n);

sum1=sum_of_pwrs(na,1);
```

```
fprintf('\n sum from the for_loop is %d', sum1 );
```

 sum from the for_loop is 25

```
sum2= (n.^2);
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

 sum from the guessed formula is   25

```
chk_value(sum1,sum2)
```

 your guess formula is right

(b) sum of first n even positive integers

```
clear;
clc;

n = input('enter the value of n :\n');
na = 2:2:(2*n);

sum1=sum_of_pwrs(na,1);
fprintf('\n sum from the for_loop is %d', sum1 );
```

 sum from the for_loop is 30

```
sum2=(n)*(n+1);
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

 sum from the guessed formula is   30

```
chk_value(sum1,sum2)
```

 your guess formula is right

(c)sum of squares of first n even positive integers

```
clear;
clc;

n = input('enter the value of n :\n');
na = 2:2:(2*n);

sum1=sum_of_pwrs(na,2);
fprintf('\n sum from the for_loop is %d', sum1 );
```

 sum from the for_loop is 220

```
sum2=4*n*(n+1)*(2*n+1)/6;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

 sum from the guessed formula is   220

```
chk_value(sum1,sum2)
```

  your guess formula is right

(d) sum of squares of first n odd positive integers

```
clear;
clc;


n = input('enter the value of n :\n');
na = 1:2:(2*n);

sum1=sum_of_pwrs(na,2);
fprintf('\n sum from the for_loop is %d', sum1 );
```

  sum from the for_loop is 165

```
sum2=(n)*((2*n)-1)*((2*n)+1)/3;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

  sum from the guessed formula is   165

```
chk_value(sum1,sum2)
```

  your guess formula is right

Q5: Prove that sum(sqr(odd_nos till 2n+1)) = (n+1)(2n+1)(2n+3/)3

```
clear;
clc;


n = input('enter the value of n :\n');
na = 1:2:((2*n)+1);

sum1=sum_of_pwrs(na,2);
fprintf('\n sum from the for_loop is %d', sum1 );
```

  sum from the for_loop is 286

```
sum2=(n+1)*((2*n)+1)*((2*n)+3)/3;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

  sum from the guessed formula is   286

```
chk_value(sum1,sum2)
```

  your guess formula is right

Q6: Prove that sum(n*n!) = (n+1)!-1

```matlab
clear;
clc;


n = input('enter the value of n :\n');


1:n
```

ans = 1×5
>   1   2   3   4   5

```matlab
sum1 = 0;
for i = 1:n
    sum1=sum1+ i*factorial(i);
end
fprintf('\n sum from the for_loop is %d', sum1 );
```

  sum from the for_loop is 719

```matlab
sum2=factorial(n+1)-1;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

  sum from the guessed formula is   719

```matlab
chk_value(sum1,sum2)
```

  your guess formula is right

Q7: Prove that summation(3*5^(n)) = 3(5^(n+1)-1)/4

```matlab
clear;
clc;


n = input('enter the value of n :\n');


1:n
```

ans = 1×5
>   1   2   3   4   5

```matlab
sum1 = 0;
for i = 0:n
    sum1=sum1+3*5^(i);
end
fprintf('\n sum from the for_loop is %d', sum1 );
```

  sum from the for_loop is 11718

```
sum2=3*((5^(n+1))-1)/4;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

```
  sum from the guessed formula is   11718
```

```
chk_value(sum1,sum2)
```

```
  your guess formula is right
```

Q8: Prove that summation(2*-1^n*7^n) = (1 - (-7)^n+1)/4

```
clear;

n = input('enter the value of n :\n');

sum1 = 0;
for i = 0:n
    sum1= sum1 + 2*((-7)^i);
end
fprintf('\n sum from the for_loop is %d', sum1 );
```

```
  sum from the for_loop is -29412
```

```
sum2=(1 - ( (-7)^(n+1)) )/4;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

```
  sum from the guessed formula is   -29412
```

```
chk_value(sum1,sum2)
```

```
  your guess formula is right
```

Q9 a) and b), sum of even numbers

```
clear;
clc;

n = input('enter the value of n :\n');
na = 2:2:(2*n);

sum1=sum_of_pwrs(na,1);
fprintf('\n sum from the for_loop is %d', sum1 );
```

```
  sum from the for_loop is 30
```

```
sum2=(n)*(n+1);
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

```
  sum from the guessed formula is   30
```

```
chk_value(sum1,sum2)
```

   your guess formula is right

Q10 a) and b)

```
clear;
clc;
n=input("Enter value of n: ")
```

n =
5

```
sum1=0;

for i=1:n
  sum1=sum1 + 1/(i*(i+1));
end
fprintf('\n sum from the for_loop is %d', sum1 );
```

   sum from the for_loop is 8.333333e-01

```
sum2=n/(n+1);
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

   sum from the guessed formula is   8.333333e-01

```
chk_value(sum1,sum2)
```

   your guess formula is right

Q11

```
n=input("Enter n: ")
```

n =
5

```
sum1=0;

for i=1:n
  sum1 = sum1 + (1/(2^i));
end
fprintf('\n sum from the for_loop is %d', sum1 );
```

   sum from the for_loop is 9.687500e-01

```
sum2=((2^n)-1)/2^n;
fprintf('\n sum from the guessed formula is   %d', sum2 );
```

   sum from the guessed formula is   9.687500e-01

```
chk_value(sum1,sum2)
```

your guess formula is right

```
chk_value(sum1,sum2)
```

your guess formula is right