```
function F=fact(n)
    if floor(n)~=n || n<0
        disp('the factorial is defined only for nonnegative integers')
    elseif n==0
        F=1;
    else
        F=fact(n-1)*n;
    end
end
```

```
function P=P2(n,k)
    if floor(n)~=n || floor(k)~=k
        disp('values must be integers')
    elseif n<0 || k<0
        disp('combinations are not defined for negative n or negaitve k')
    elseif n<k
        disp('we cannot choose k out of n when n<k')
    else
        P=fact(n)/fact(n-k);
    end
end
```

```
P2(3,4)
```

```
we cannot choose k out of n when n<k
```

```
P2(-2,4)
```

```
combinations are not defined for negative n or negaitve k
```

```
P2(4,3)
```

```
ans = 24
```

```
function S=S2(n)
    if floor(n)~=n
        disp('integer value required')
    elseif n<0
        disp('positive numbers only')
    elseif n==1
        S=1;
    else
        S=S2(n-1)+2*n-1;
    end
end
```

```
S2(-2)
```

```
positive numbers only
```

```
S2(1)
```

```
ans = 1
```

```
S2(3)
```

```
ans = 9
```

```
S2(5)
```

```
ans = 25
```

```
S2(8)
```

```
ans = 64
```