1.
(a)
```matlab
function y=pw_linear(x)
y=x;
ind=find(x>3);
y(ind)=2;
ind=find(x<=3 & x>0);
y(ind)=x(ind)-1;
ind=find(x<=0);
y(ind)=-x(ind);
return
```

(b)
```matlab
x=linspace(-5,5);
y=pw_linear(x);
plot(x,y)
```

2.
(a)創造一個4 4矩陣，每一行每一列皆只含有{1,2,3,4}其中一個值
(b)
```matlab
function S=new()
S=zeros(4,4);
p1=randperm(4);
p2=randperm(4);
for i=1:4
  j=p1(i);
  c=p2(i);
  S(i,j)=c;
end
return
```

3.
(a)
```matlab
function B=submatrix(A,i)
n=length(A(1,:));
B=[];
for j=1:n
```

```matlab
    if j~=i
      v=A(2:n,j);
      B=[B v];
    end
  end
end
return
```

(b)Example:
```matlab
  A=[1 2 3;4 5 6;7 8 9]
  B=submatrix(A,1)
  B=[5 6;8 9]
```

4.
```matlab
function v=mydet(A)
n=length(A(1,:));
v=0;
if n==2
  v=A(1,1)*A(2,2)-A(1,2)*A(2,1);
  return
end
for i=1:n
  B=submatrix(A,i)
  v=v+(-1)^(i+1)*A(1,i)*mydet(B);
end
return
```

5.
(a)
```matlab
function V=count(S)
C=['A' 'T' 'C' 'G'];
V=zeros(1,4);
n=length(S);
for i=1:n
  for j=1:4
    if S(i)==C(j)
      V(j)=V(j)+1;
    end
  end
end
```

```
return
```

(b)紀錄 S 這個序列包含 A、T、C、G 的個數各為多少

6.
```
x=linspace(-5,5);
plot(x,tanh(x));
hold on;
n=length(x);
plot(x,tanh(x)+(rand(1,n)-0.3)*0.1);
```

7.
```
function v=fitting(x,y)
n=length(x);
A=zeros(2,2);
B=zeros(2,1);
A(1,1)=sum(x.^2);
A(1,2)=sum(x);
A(2,1)=A(1,2);
A(2,2)=n;
b(1,1)=sum(x'*y);
b(2,1)=sum(y);
v=inv(C)*b;
v
return
```