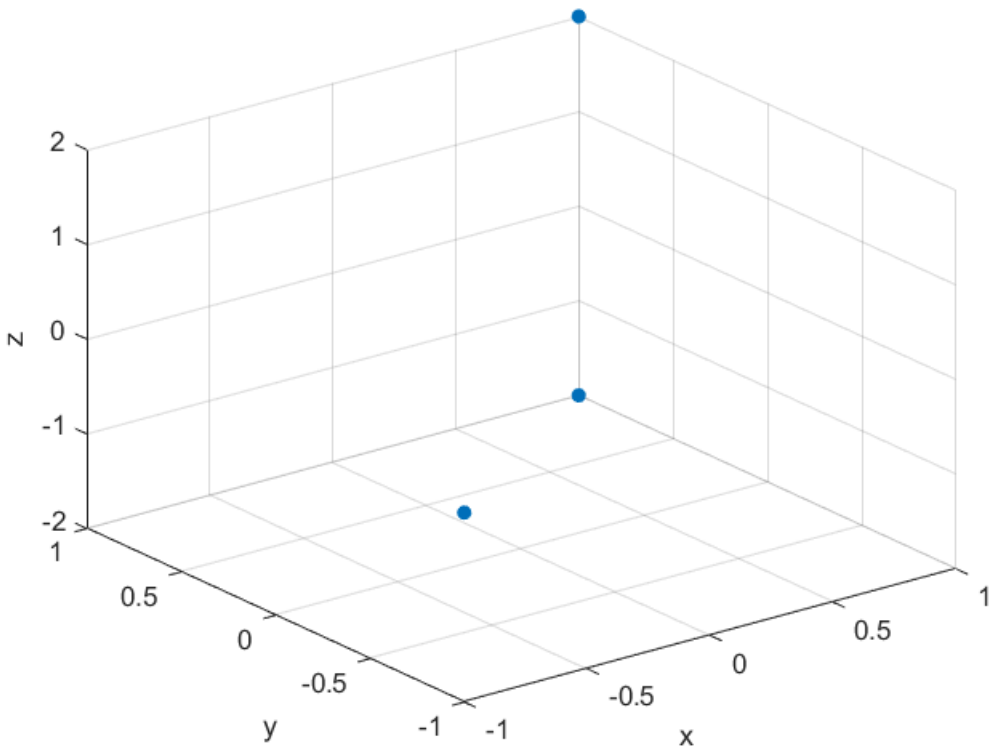
```
data = [1 1 1 -2;2 -1 -1 0;1 1 1 2];
p = data(:,1);
x = data(:,2);
y = data(:,3);
z = data(:,4);
N = length(p);
figure();
scatter3(x,y,z,30,'filled'),xlabel('x'),ylabel('y'),zlabel('z');
```



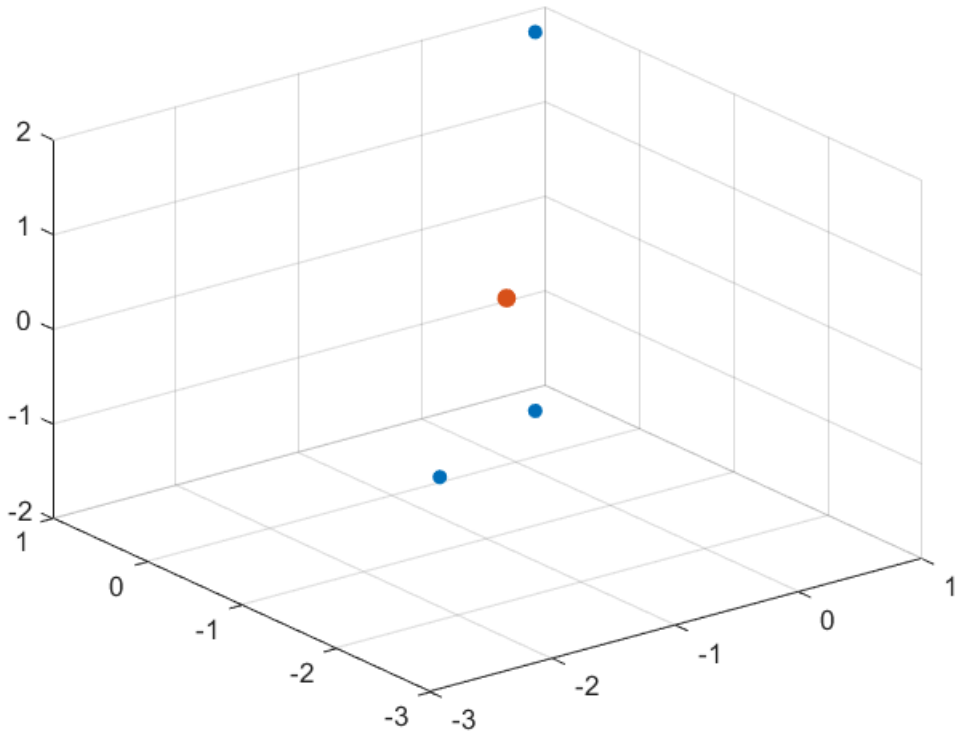

```
% Momento de orden cero
M0 = sum(p)
```

```
M0 = 4
```

```
% Momento de orden 1
x_ = mean(x);
y_ = mean(y);
z_ = mean(z);
X = x-x_;
Y = y-y_;
Z = z-z_;
m = [p.*X p.*Y p.*Z];
M1 = sum(m)/M0
```

```
M1 = 1×3
   -0.3333   -0.3333         0
```

```
figure();
scatter3(m(:,1),m(:,2),m(:,3),30,"filled"); hold on,
scatter3(M1(1),M1(2),M1(3),50,'filled');
```




```
%% momento de orden 2
for i = 1:N
XX(i) = p(i)*(X(i)^2);
XY(i) = (p(i)*X(i))*Y(i);
XZ(i) = (p(i)*X(i))*Z(i);
YX(i) = (p(i)*Y(i))*X(i);
YY(i) = p(i)*(Y(i)^2);
YZ(i) = (p(i)*Y(i))*Z(i);
ZX(i) = (p(i)*Z(i))*X(i);
ZY(i) = (p(i)*Z(i))*Y(i);
ZZ(i) = p(i)*(Z(i)^2);
end
XX = sum(XX);
XY = sum(XY);
XZ = sum(XZ);
YX = sum(YX);
YY = sum(YY);
YZ = sum(YZ);
ZX = sum(ZX);
ZY = sum(ZY);
ZZ = sum(ZZ);

M2 =[XX XY XZ;YX YY YZ;ZX ZY ZZ]
```

```
M2 = 3×3
```

```
    4.4444    4.4444         0
    4.4444    4.4444         0
         0         0    8.0000
```

```
[A_vectors,A_values] = eig(M2)
```

```
A_vectors = 3×3
   -0.7071         0    0.7071
    0.7071         0    0.7071
         0    1.0000         0
A_values = 3×3
         0         0         0
         0    8.0000         0
         0         0    8.8889
```