Ejercicio 1.

Portar a Matlab el **Ejercicio 3** de la Hoja de Problemas de python+opencv: análisis del rendimiento de un algoritmo de reconstrucción 3D.

```
% Leer datos
g_data = readtable('groundtruth.csv');
d_data = readtable('detection.csv');
s1 = size(g_data);
```

```
% Máscara de unos donde hay NaN y eliminar esas filas
idx = ismissing(d_data(:,{'Area2D','Area3D','Complexity'}));

toDelete = idx(:,1)>0;
d_data(toDelete,:) = [];
g_data(toDelete,:) = [];
```

```
% Matriz con el nuevo tamaño de los datos
s2 = size(g_data);
r = zeros(s2);
```

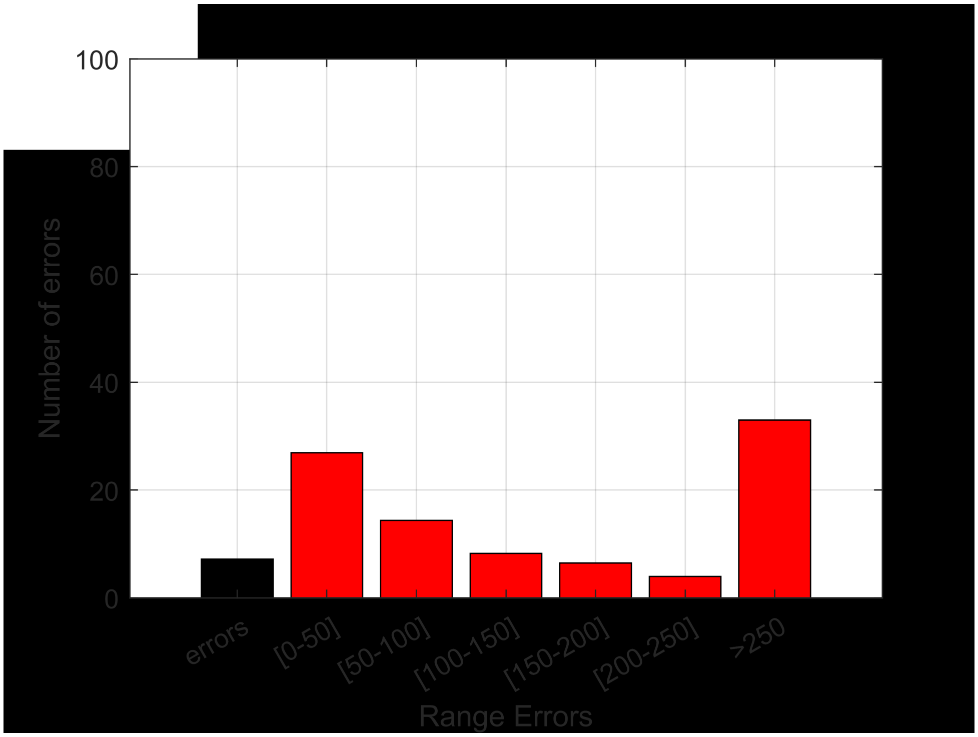
```
% Como tabla no es convertible a double, pasamos a array
g_data = table2array(g_data);
d_data = table2array(d_data);
```

```
% En la matriz nueva, colocamos el valor absoluto de la resta
% entre detecciones y ground truth
r(:, 1) = g_data(:, 1); % el Id (primera columna) no es una medición
r(:, 2) = abs(d_data(:, 2) - g_data(:, 2));
r(:, 3) = abs(d_data(:, 3) - g_data(:, 3));
r(:, 4) = abs(d_data(:, 4) - g_data(:, 4));
```

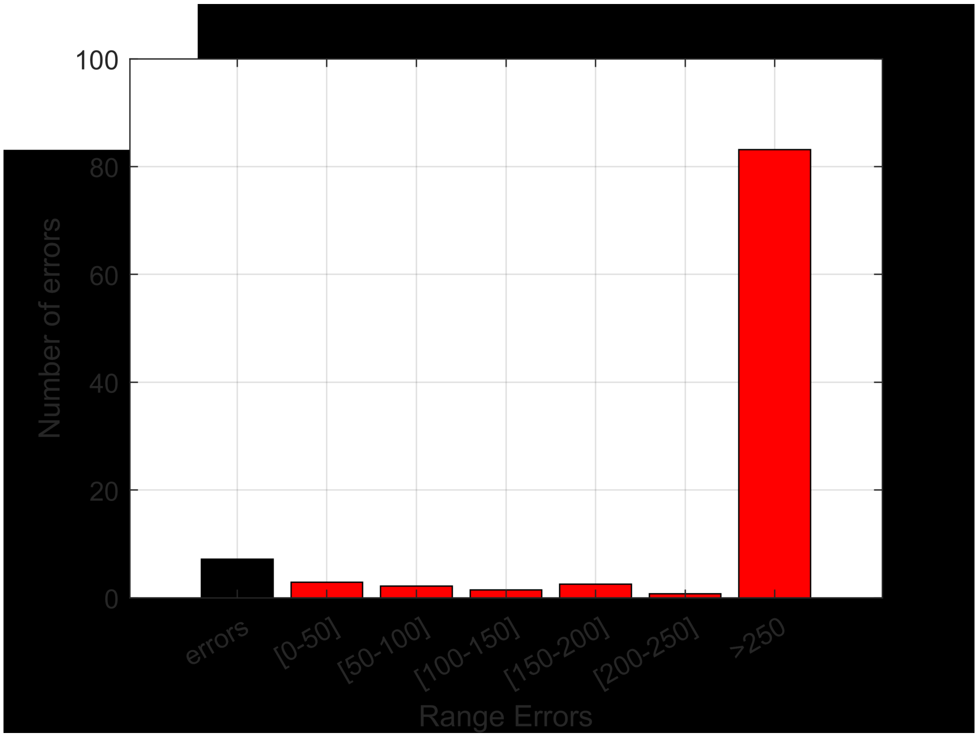
```
% Contemplamos los rangos que se van a representar
v1 = idx; % si sum nº de errores: solo columnas 'Area2D','Area3D','Complexity'
v2 = (r >= 0) & (r < 50);
v3 = (r >= 50) & (r < 100);
v4 = (r >= 100) & (r < 150);
v5 = (r >= 150) & (r < 200);
v6 = (r >= 200) & (r < 250);
v7 = (r>=250);
```

```
% Plot con bar
x = 1:1:7;
name = {'errors'; '[0-50]'; '[50-100]'; '[100-150]'; '[150-200]'; '[200-250]'; '>250'};
p = 100/s1(1);
rep = [sum(v1(:,1))*p sum(v2(:,2))*p sum(v3(:,2))*p sum(v4(:,2))*p sum(v5(:,2))*p sum(v6(:,2))*
b = bar(x,rep,'r');
b.FaceColor = 'flat';
b.CData(1,:) = [0 0 0]; % primera barra de color negro
```

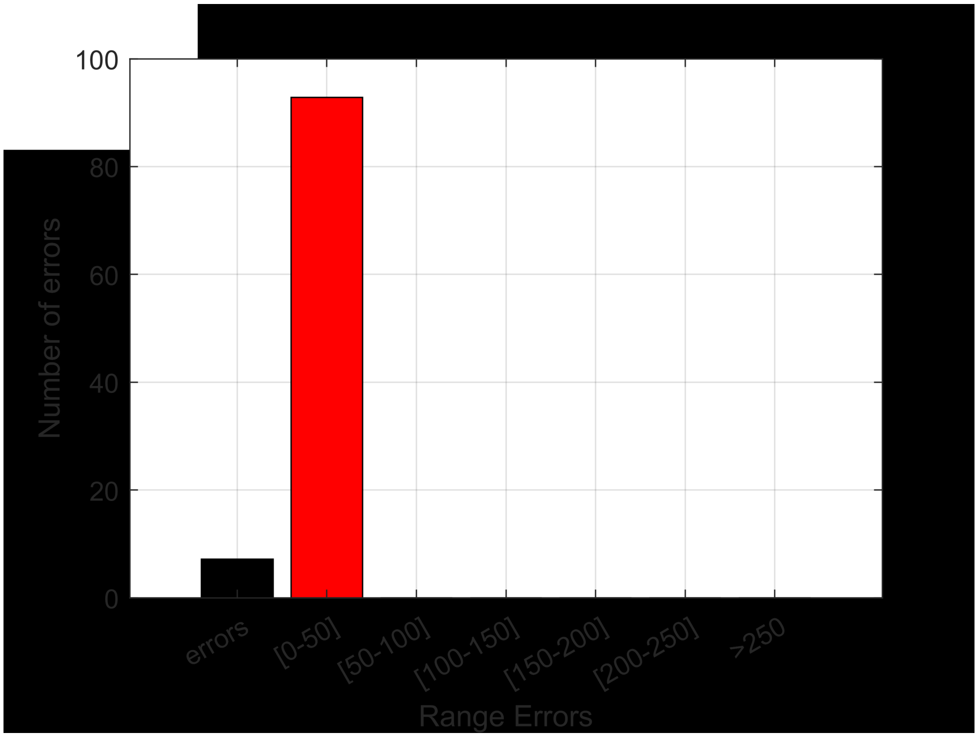
```
f = gcf;
title('Error 2D')
xlabel('Range Errors')
ylabel('Number of errors')
ylim([0 100])
set(gca,'xticklabel',name)
exportgraphics(f,'error2D.png','Resolution',300)
grid on
```



```
rep1 = [sum(v1(:,2))*p sum(v2(:,3))*p sum(v3(:,3))*p sum(v4(:,3))*p sum(v5(:,3))*p sum(v6(:,3)
b1 = bar(x,rep1,'r');
b1.FaceColor = 'flat';
b1.CData(1,:) = [0 0 0];
f1 = gcf;
title('Error 3D')
xlabel('Range Errors')
ylabel('Number of errors')
ylim([0 100])
set(gca,'xticklabel',name)
exportgraphics(f1,'error3D.png','Resolution',300)
grid on
```



```
rep2 = [sum(v1(:,3))*p sum(v2(:,4))*p sum(v3(:,4))*p sum(v4(:,4))*p sum(v5(:,4))*p sum(v6(:,4))
b2 = bar(x,rep2,'r');
b2.FaceColor = 'flat';
b2.CData(1,:) = [0 0 0];
f2 = gcf;
title('Error Complexity')
xlabel('Range Errors')
ylabel('Number of errors')
ylim([0 100])
set(gca,'xticklabel',name)
exportgraphics(f2,'errorcomplexity.png','Resolution',300)
grid on
```


100
80
60
40
20
0
Number of errors
errors
[0-50]
[50-100]
[100-150]
[150-200]
[200-250]
>250
Range Errors