

# TFG informe inicial

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## 1 Data

### 1.1 Initial Data

- Embedding matrix of size (50000, 12416), con 62080000 features.
- **labels** Labels vector of size 50k which every label is in numeric format (0, 999)
- **synsets = synset0 synset1 synset2 ...** The set of synsets that we will analyze:  
*synsets\_living\_things = [living\_things, mammal, dog, hunting\_dogs]*  
*synsets\_non\_living\_things = [artifact, instrumentality, conveyance, wheeled\_vehicle]*
- **categories = {-1 0 1 }** The possible values of the features.
- **The layers:**

```
self.layers = {
    'conv1_1': [0, 64],  # 1
    'conv1_2': [64, 128], # 2
    'conv2_1': [128, 256], # 3
    'conv2_2': [256, 384], # 4
    'conv3_1': [384, 640], # 5
    'conv3_2': [640, 896], # 6
    'conv3_3': [896, 1152], # 7
    'conv4_1': [1152, 1664], # 8
    'conv4_2': [1664, 2176], # 9
    'conv4_3': [2176, 2688], # 10
    'conv5_1': [2688, 3200], # 11
```

```

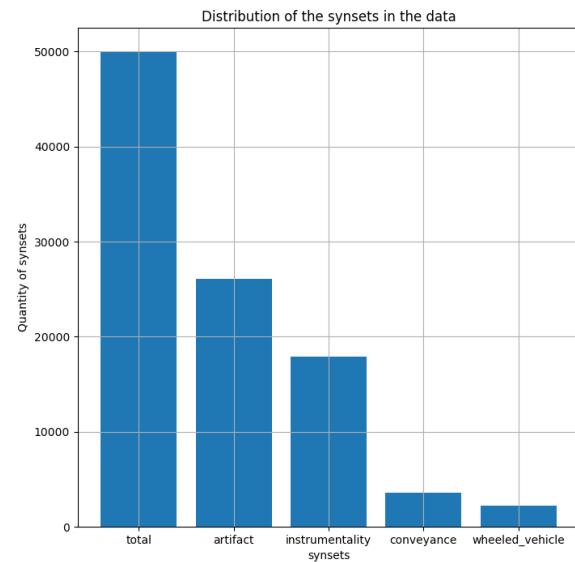
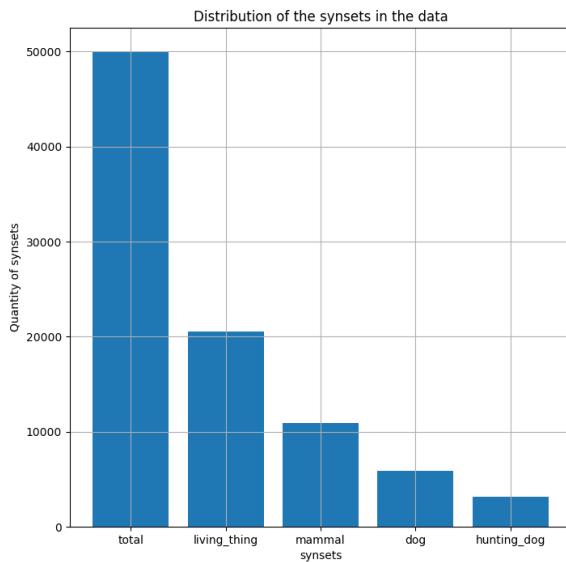
        'conv5_2': [3200, 3712], # 12
        'conv5_3': [3712, 4224], # 13
        'fc6': [4224, 8320], # 14
        'fc7': [8320, 12416], # 15
        'conv1': [0, 128], # 16
        'conv2': [128, 384], # 17
        'conv3': [384, 1152], # 18
        'conv4': [1152, 2688], # 19
        'conv5': [2688, 4224], # 20
        'conv': [0, 4224], # 21
        '2_5conv': [128, 4224], # 22
        'fc6tofc7': [4224, 12416], # 23
        '# all': [0, 12416] # 24
    }
    self.reduced_layers = {
        'conv1': [0, 128],
        'conv2': [128, 384],
        'conv3': [384, 1152],
        'conv4': [1152, 2688],
        'conv5': [2688, 4224],
        'fc6': [4224, 8320],
        'fc7': [8320, 12416]
    }
}

```

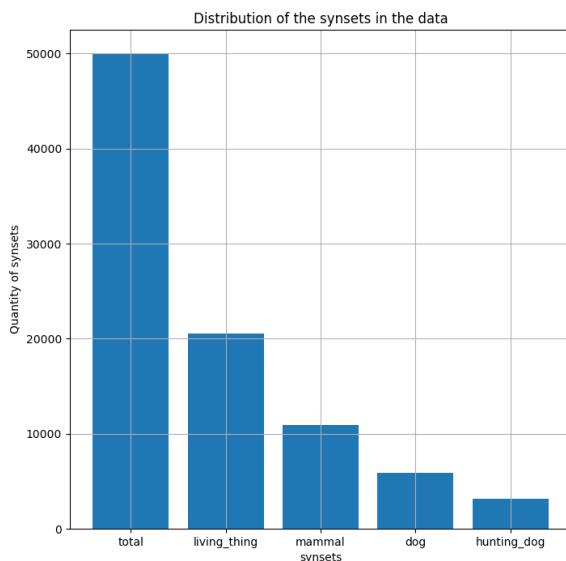
## 1.2 Generated Data

- **synset\_index\_hyponim.txt** A list with all the hyponyms of every synset.
- **synset\_index.txt** For each synset a list with the index of the elements of the hyponym list in the embedding.
- Un diccionario con la cantidad de imágenes que tiene cada feature para cada category.
- **features\_per\_image[synsets].pkl** Es un diccionario que contiene :  
feature\_per\_image[image][category] = cantidad e imagenes de esta categoría
- **features\_per\_layer[synsets].pkl** features\_per\_layer[layer][category] = cantidad de features de la category tal en el layer
- **Images/\_per\_feature\_per\_synset[synsets].pkl** Genera un diccionario tal que:  
dict[features][category][synset] = cantidad e imagenes del synset que tienen esta categoria en cuestión.
- **intra\_synset[synsets].pkl** dict[synset][synsethijo] = cantidad de synset hijo en synset

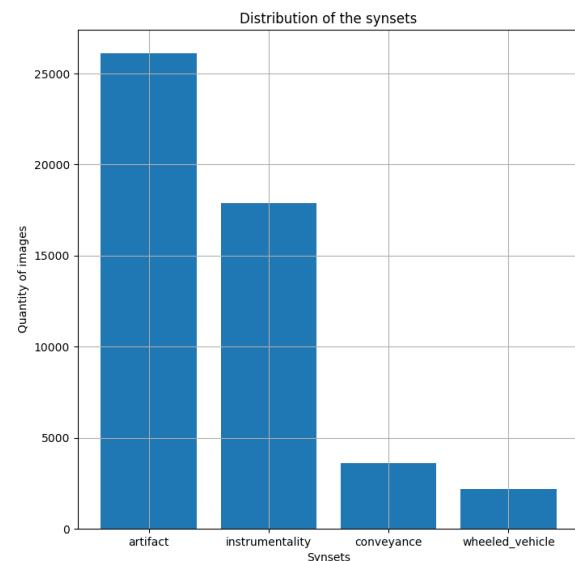
## 2 Análisis Base



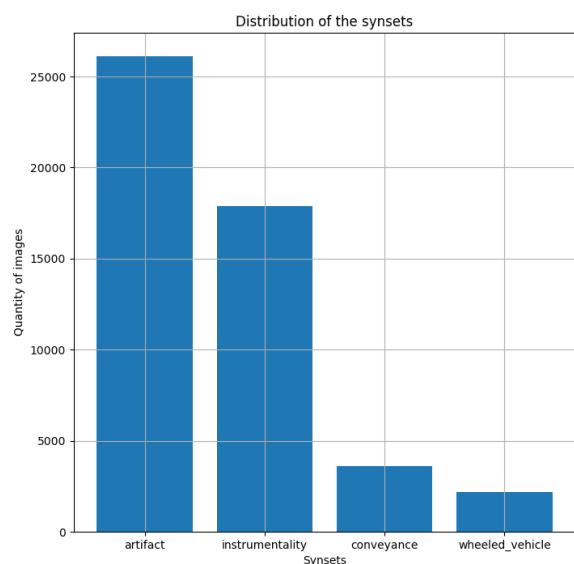
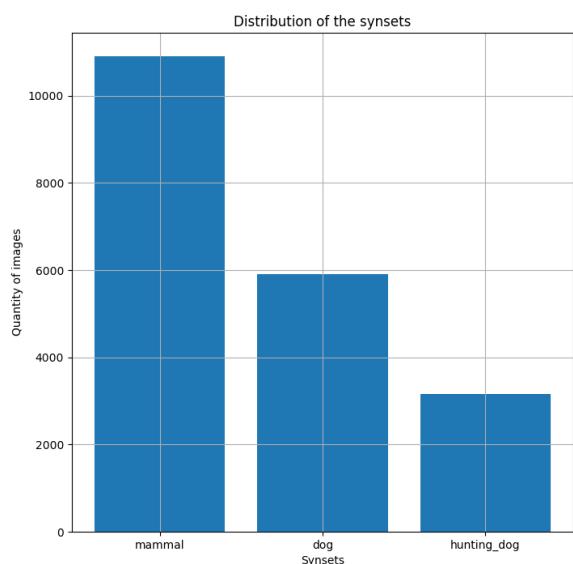
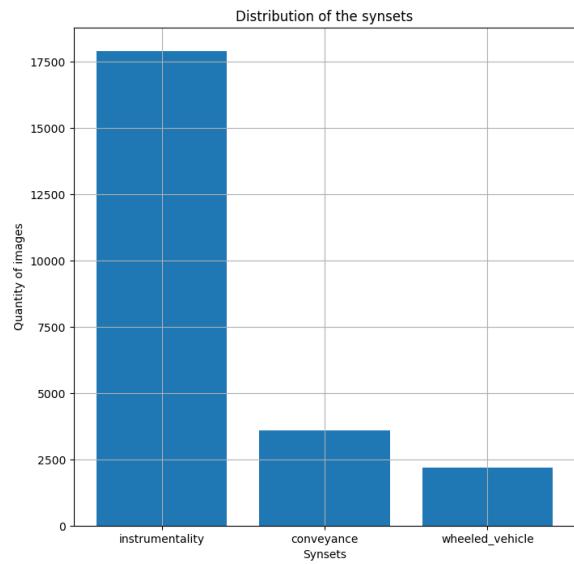
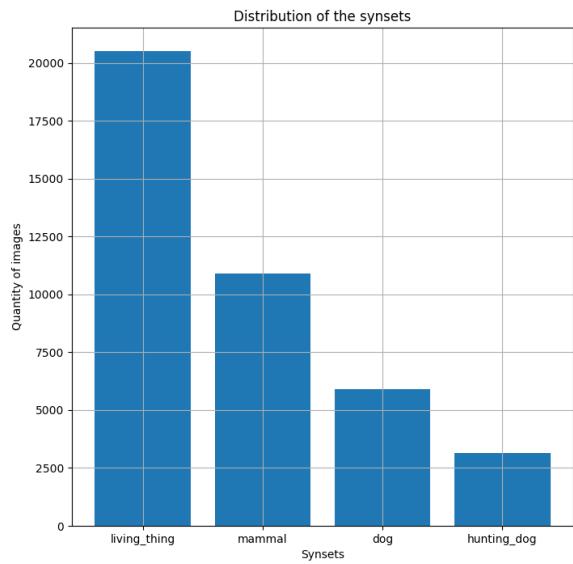
### 2.1 Intra sinset

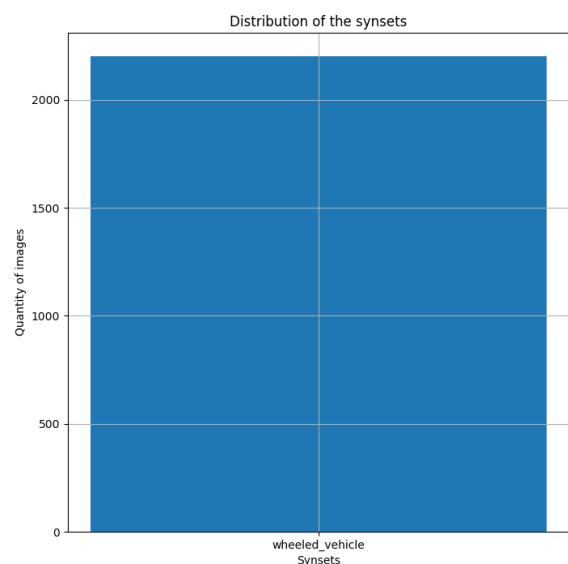
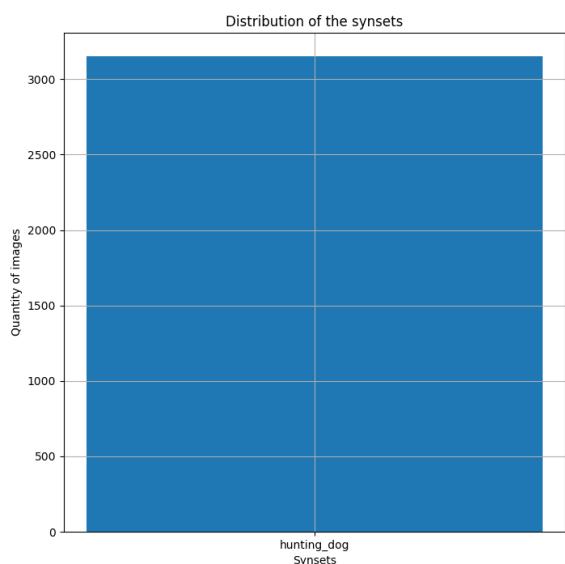
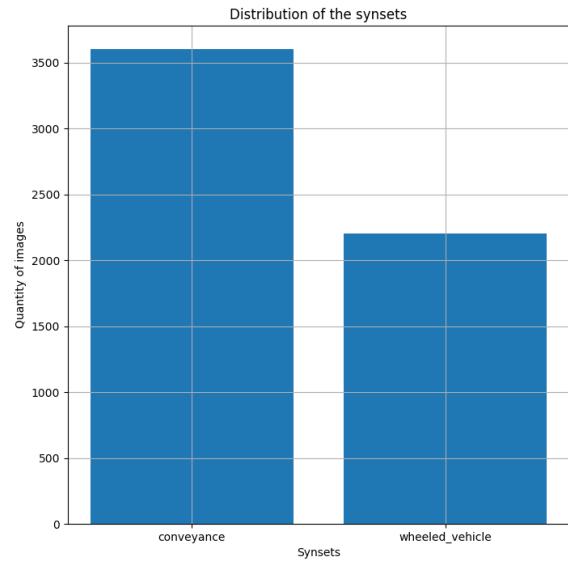
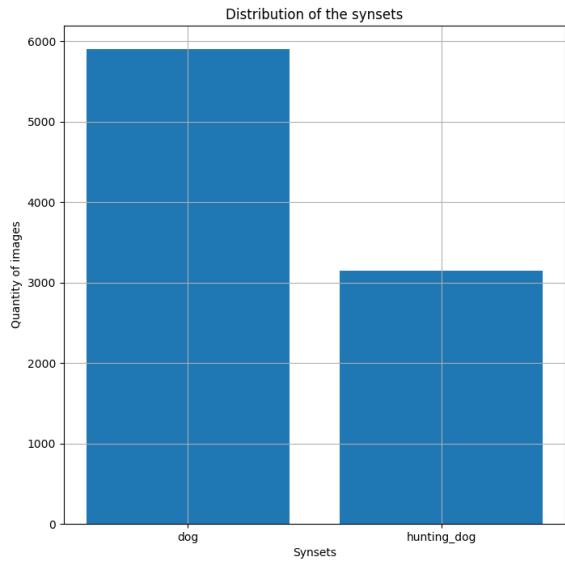


Living Things

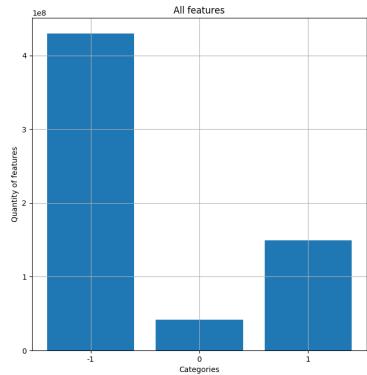


Non Living Things

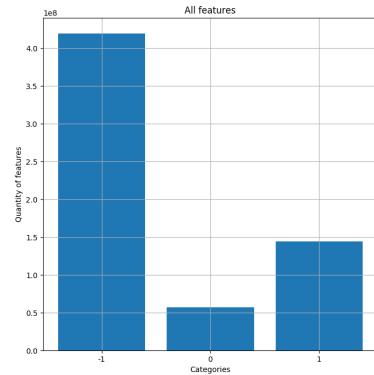




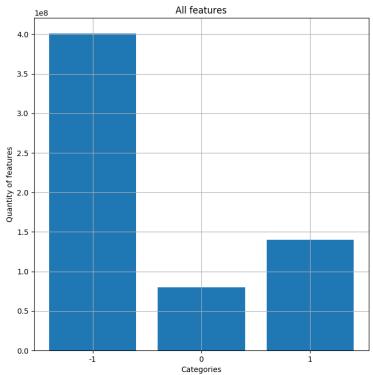
## 2.2 Distribución total de las features



Embedding 19

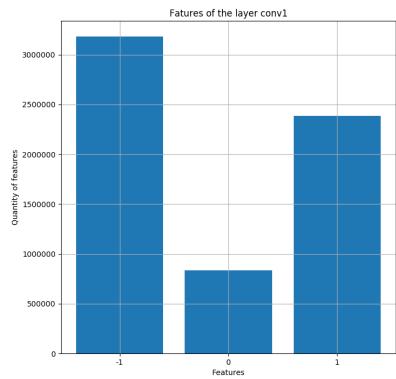


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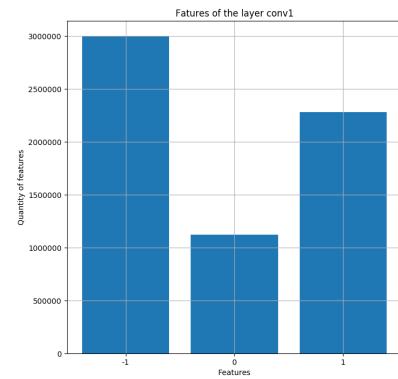


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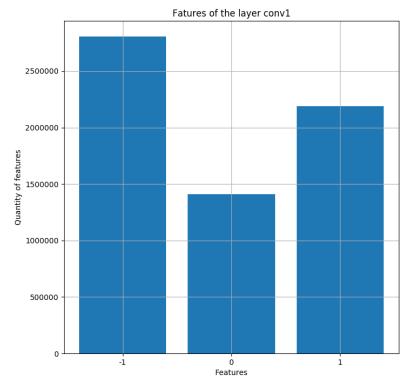
## 2.3 Distribución de las features por layer



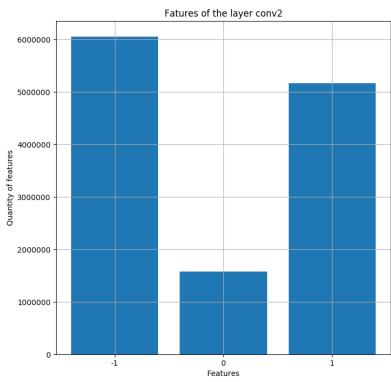
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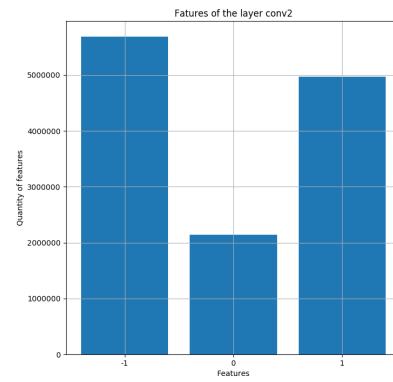
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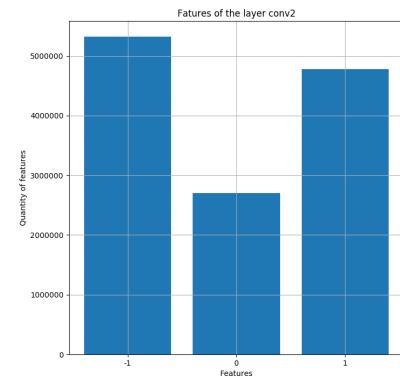
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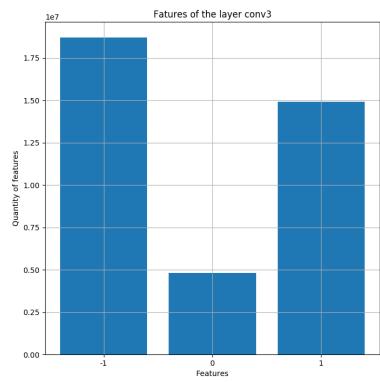
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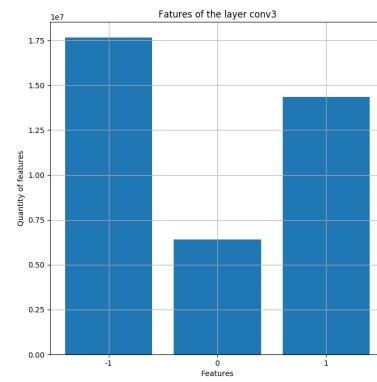
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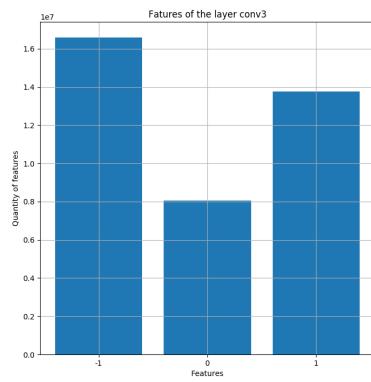
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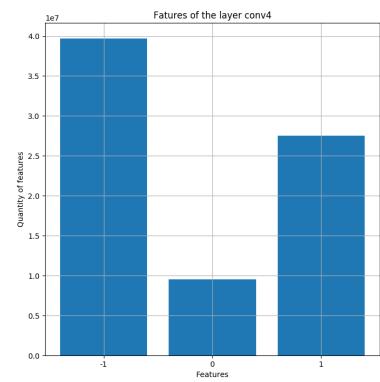
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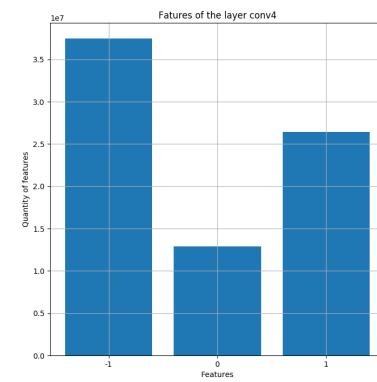
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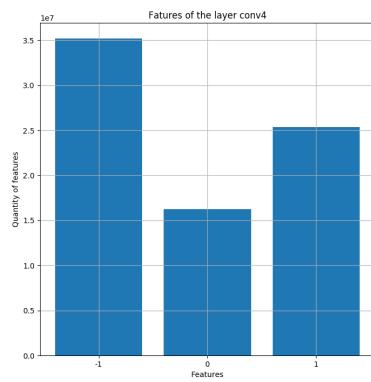
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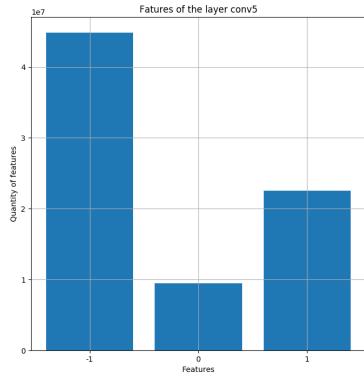
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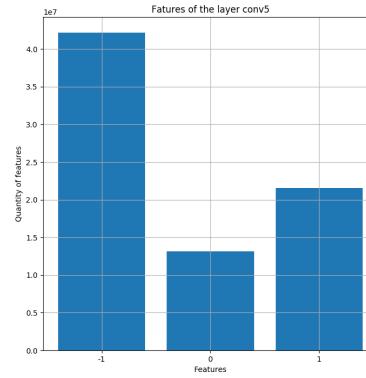
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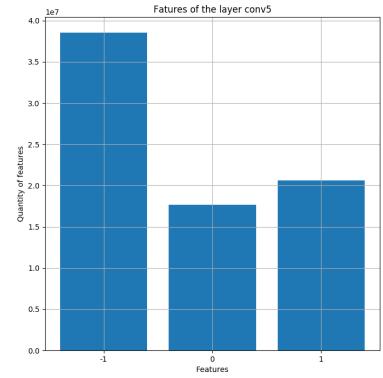
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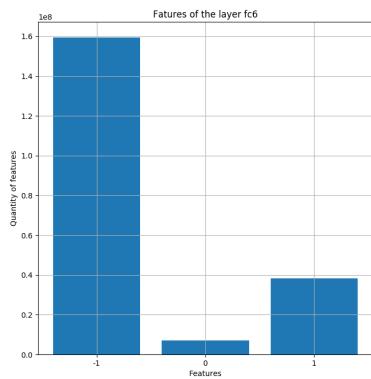
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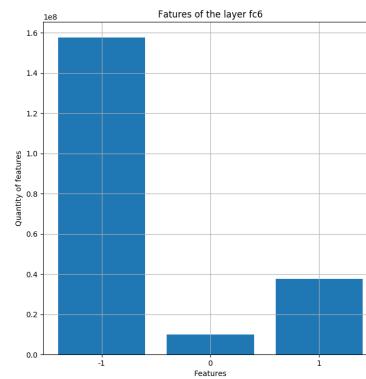
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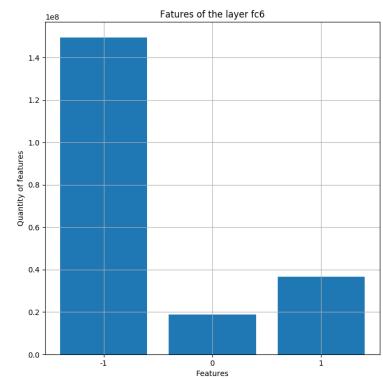
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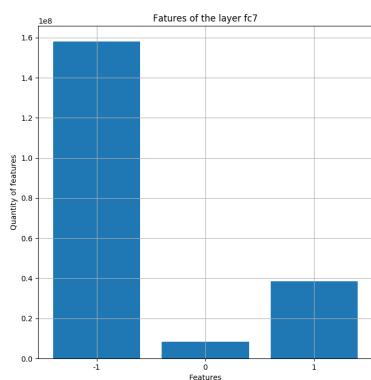
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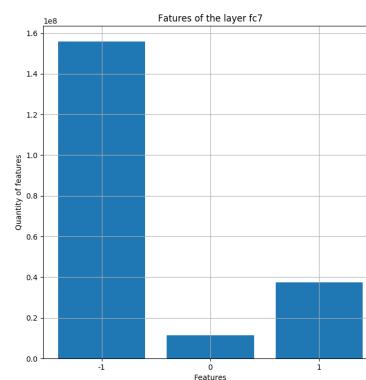
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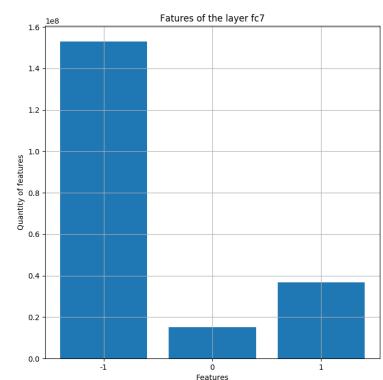
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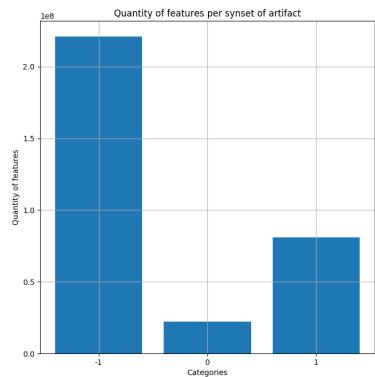


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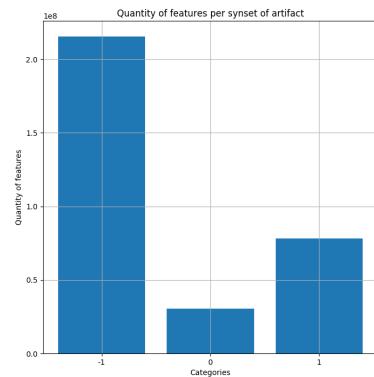


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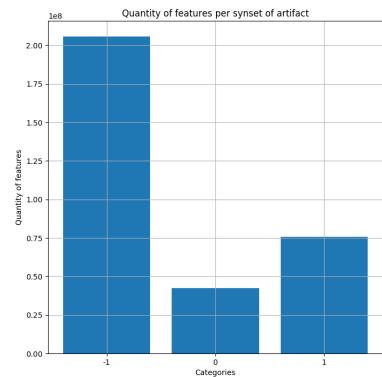
## 2.4 Distribución de las features por synset



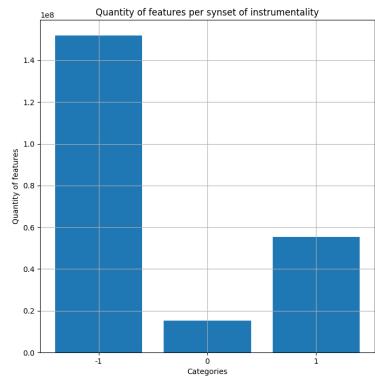
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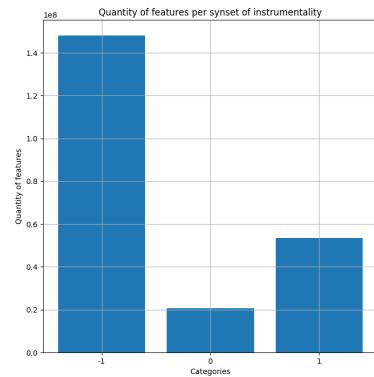
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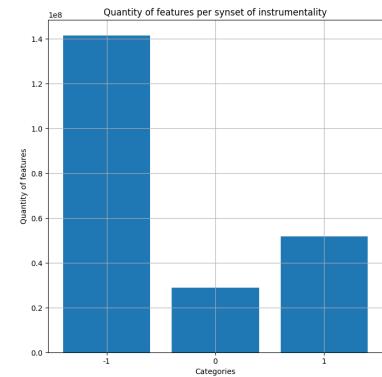
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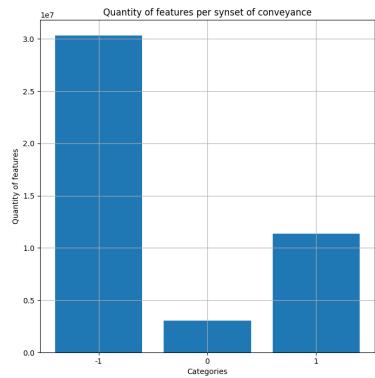
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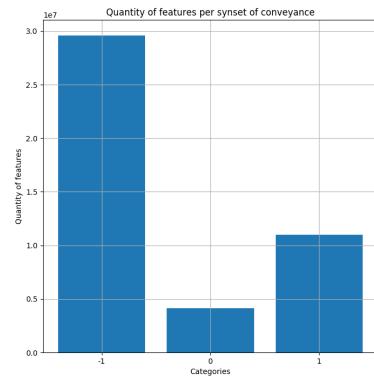
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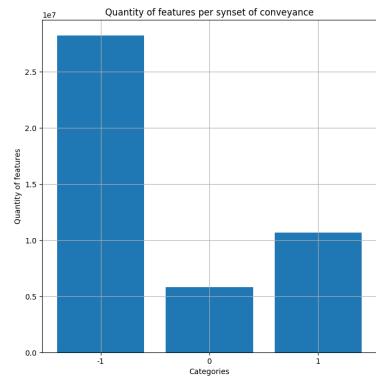
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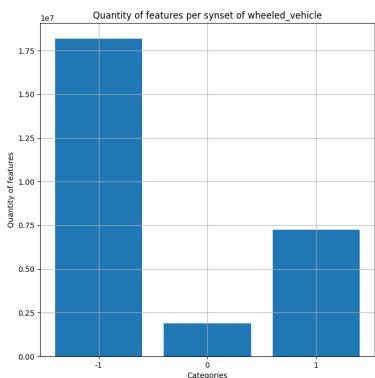
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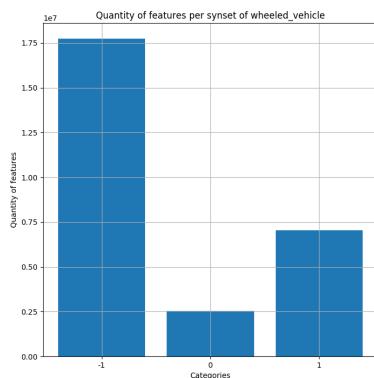
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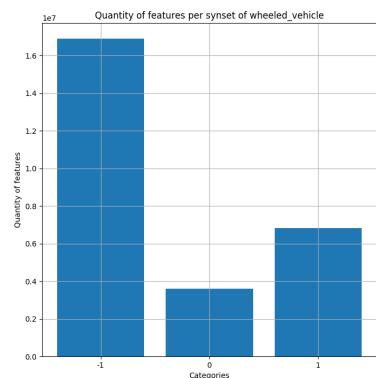
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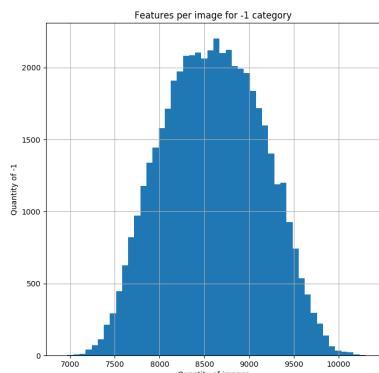
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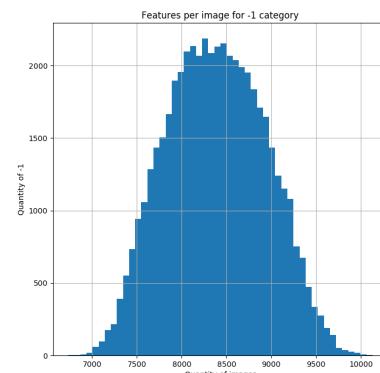
Embedding 31

## 2.5 Features per image

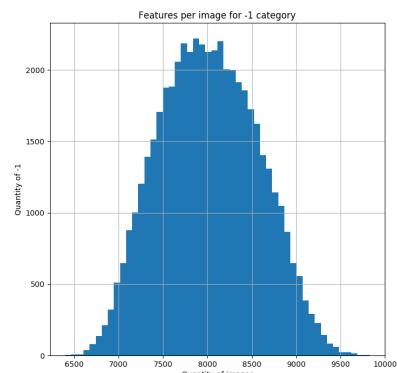
There are for each image the total counting of features active, for the different possible categories ( $-1, 0, 1$ ):



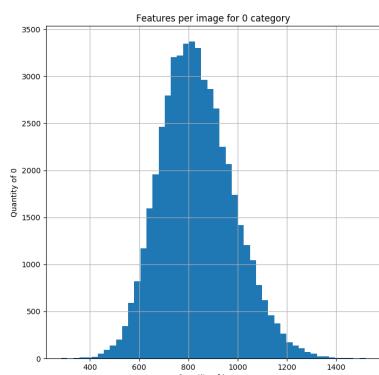
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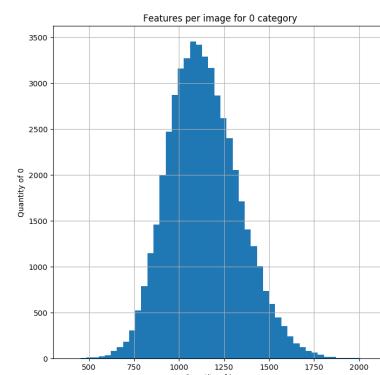
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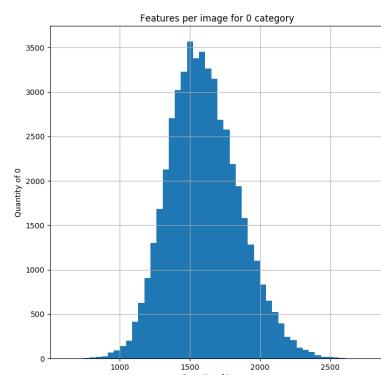
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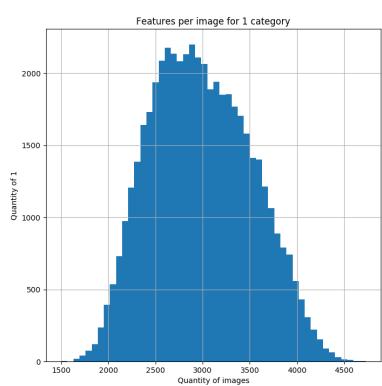
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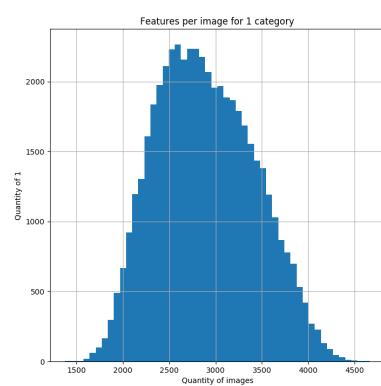
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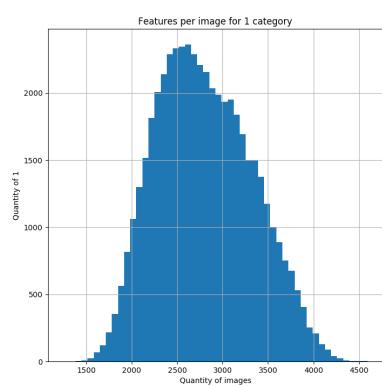
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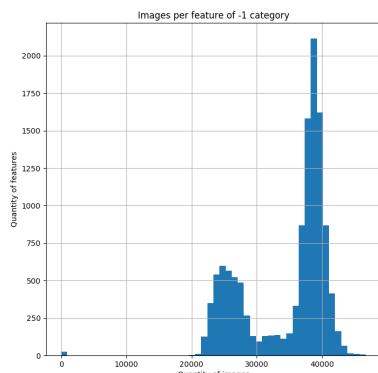
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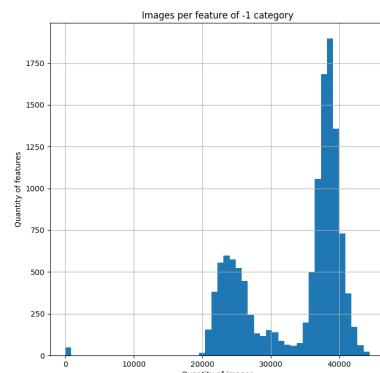
Embedding 31

## 2.6 Images per feature

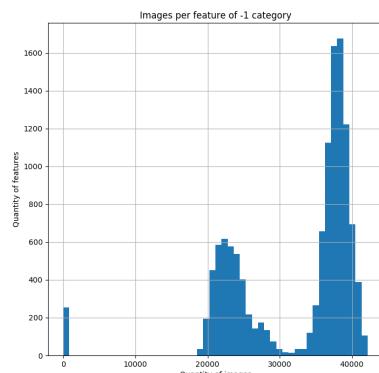
Now I calculate for each feature how many images activate in each specific category:



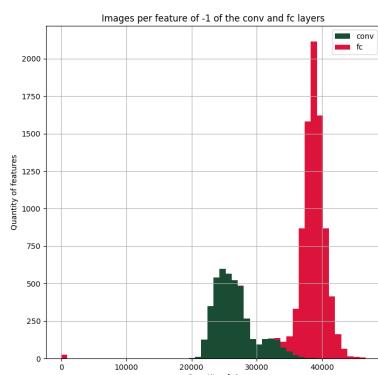
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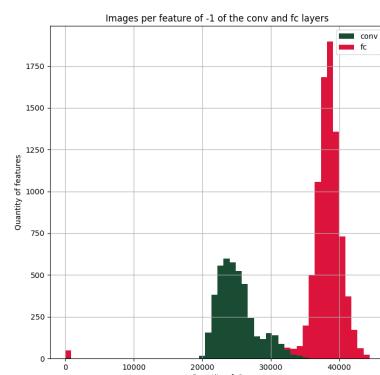
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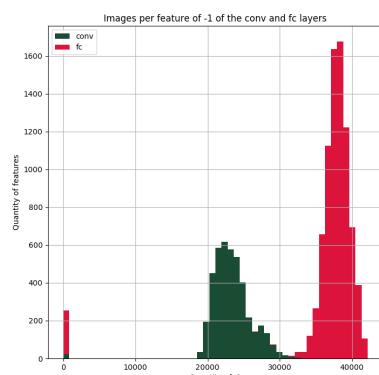
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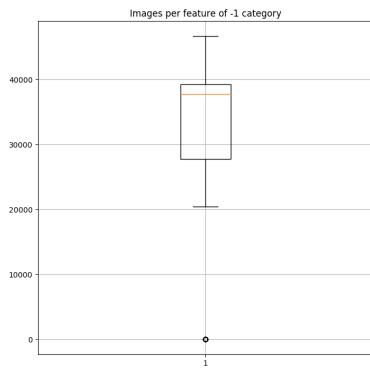
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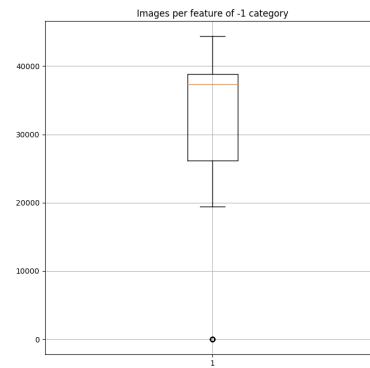
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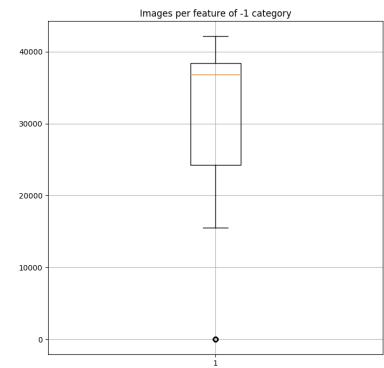
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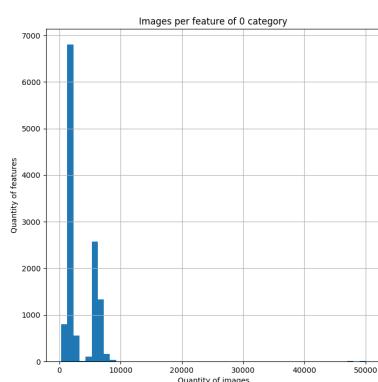
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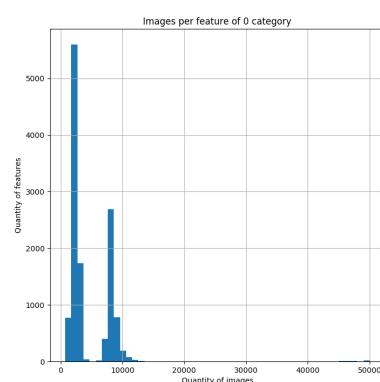
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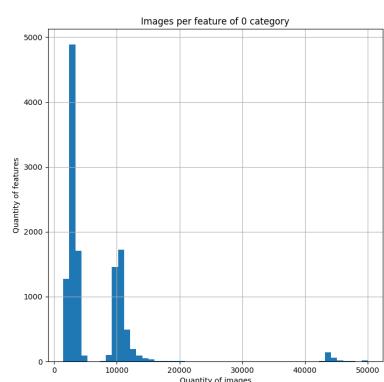
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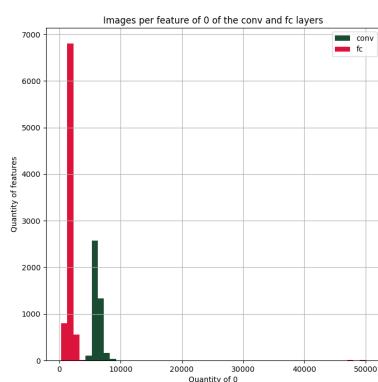
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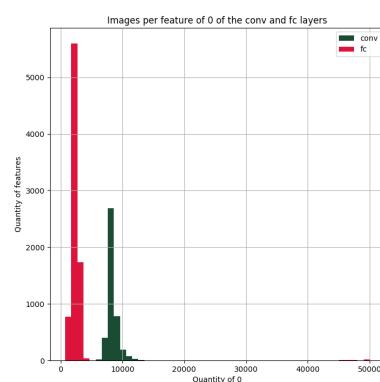
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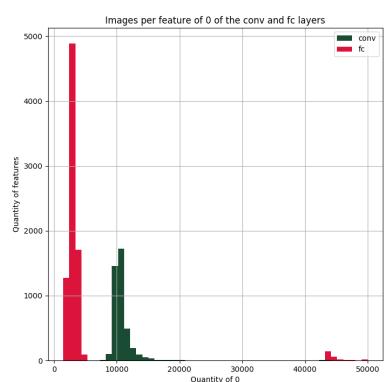
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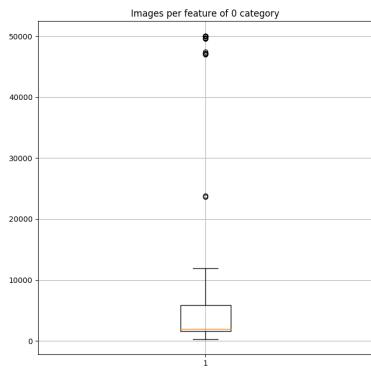
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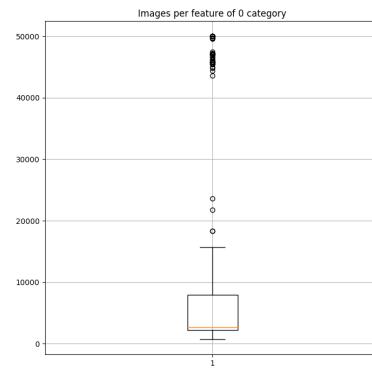
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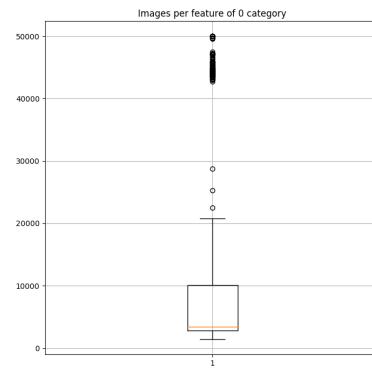
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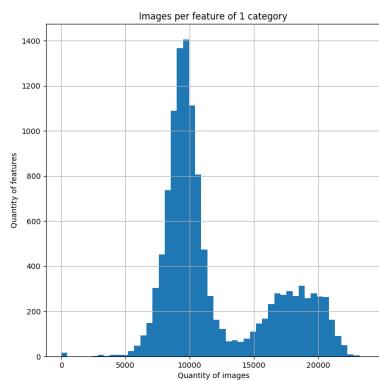
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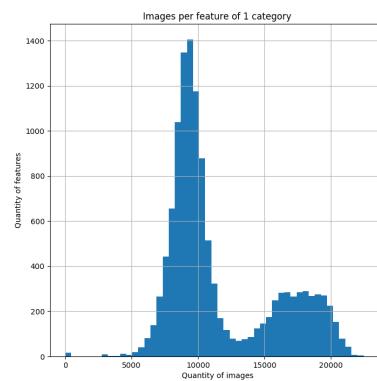
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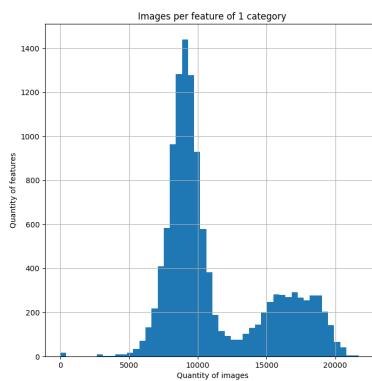
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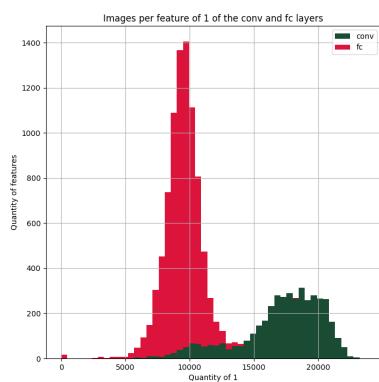
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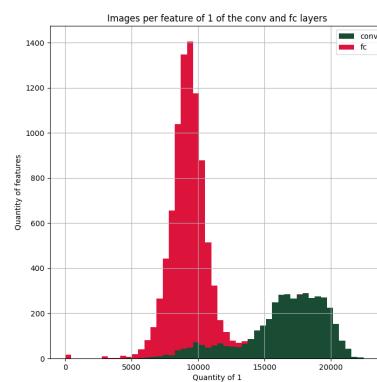
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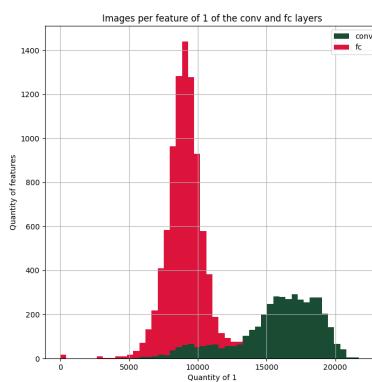
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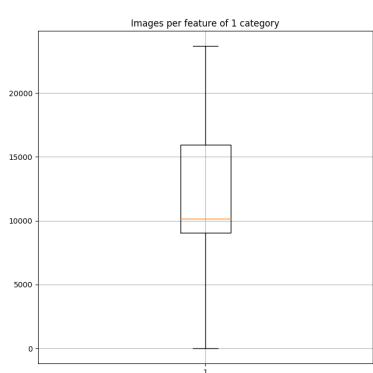
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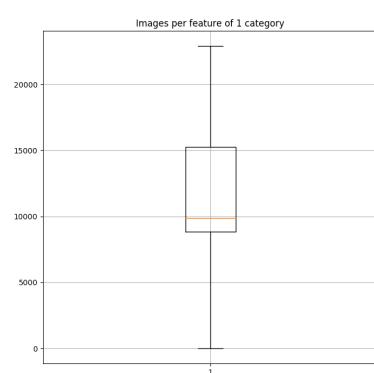
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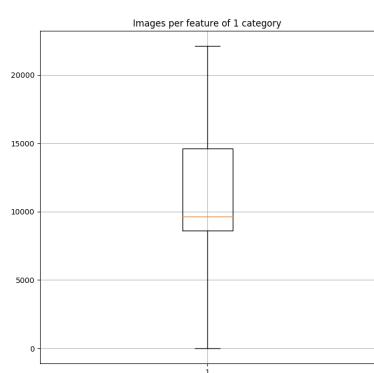
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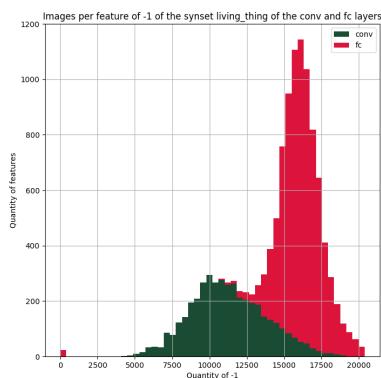


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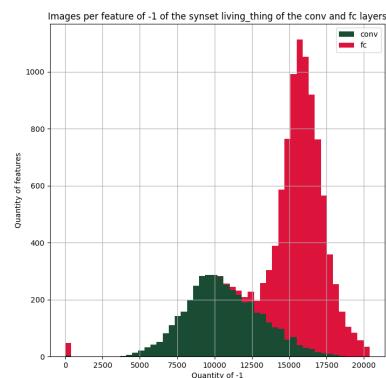


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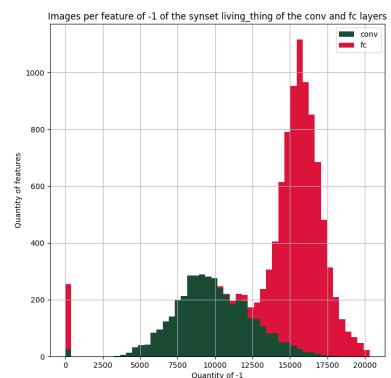
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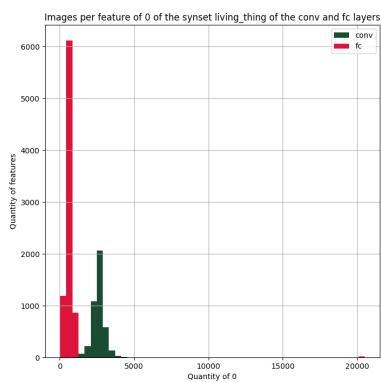
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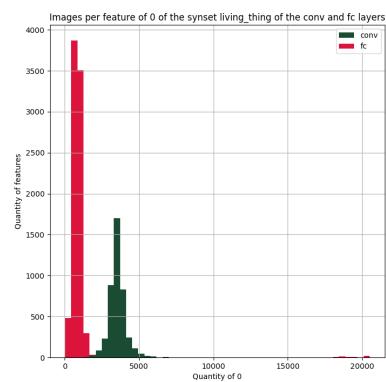
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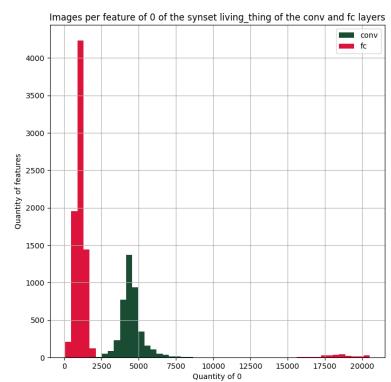
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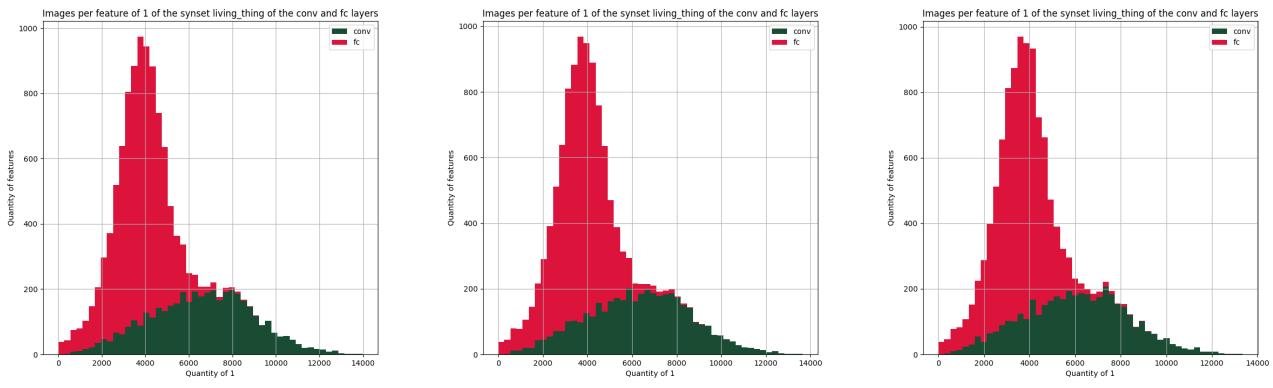
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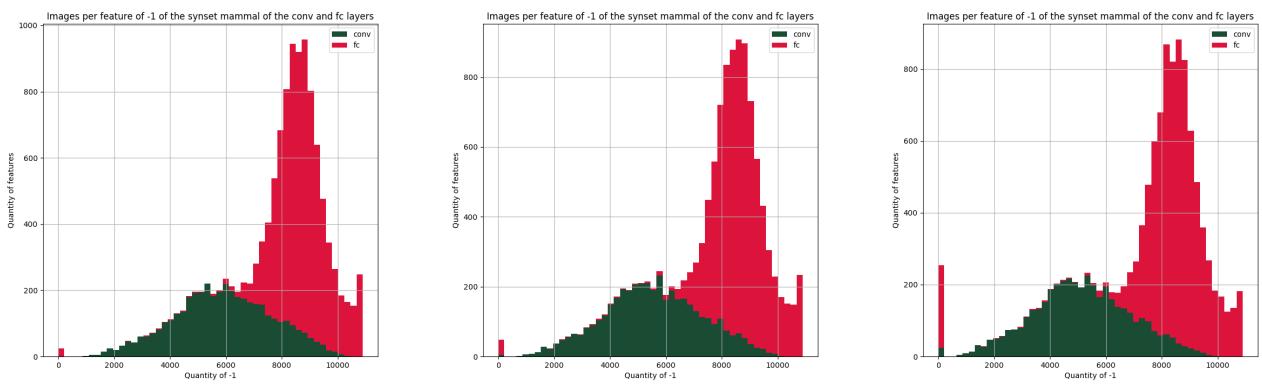
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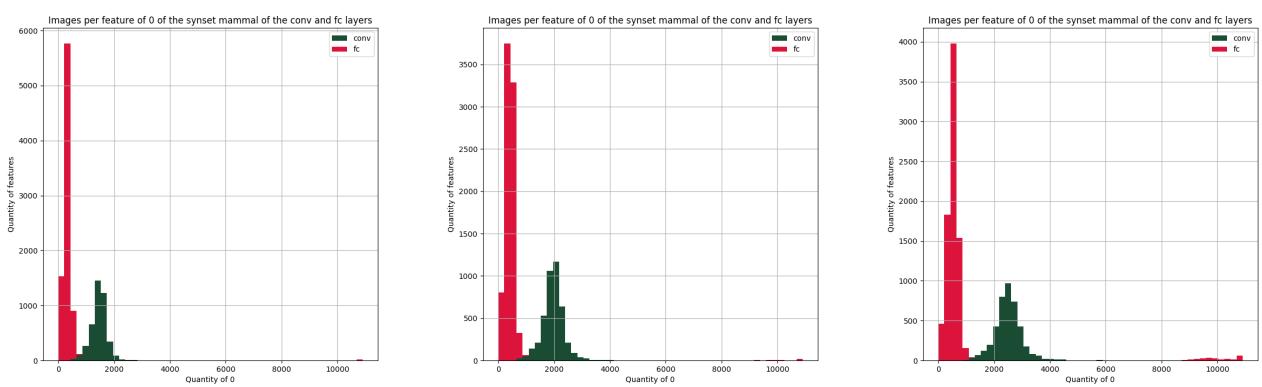
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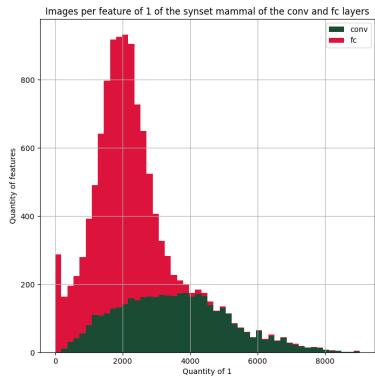
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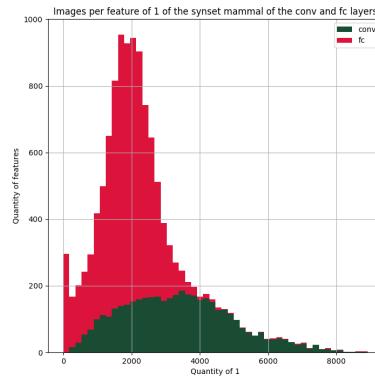
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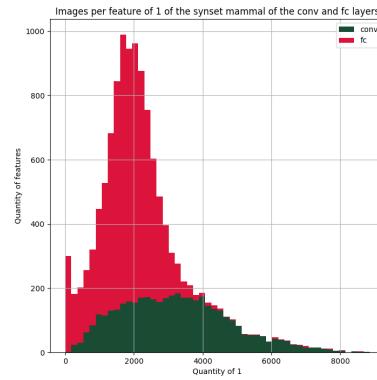
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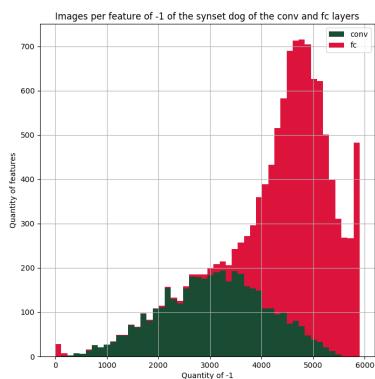
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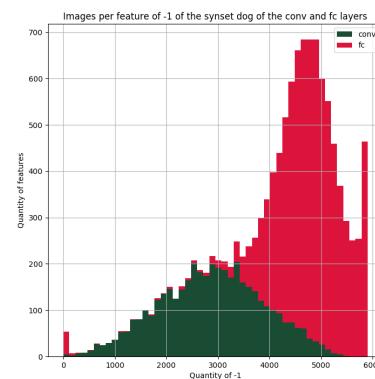
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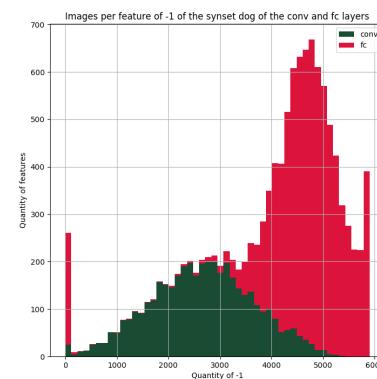
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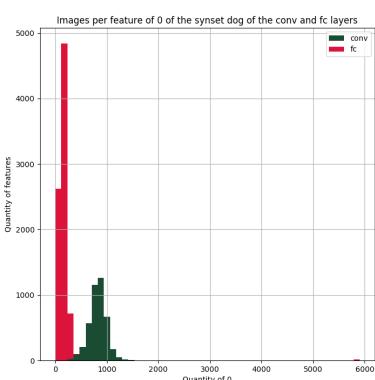
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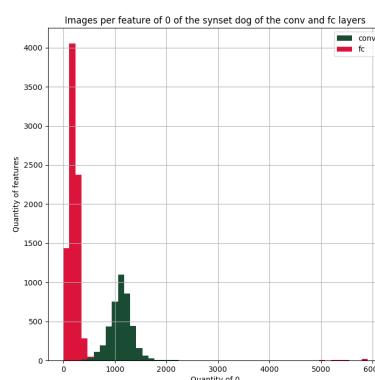
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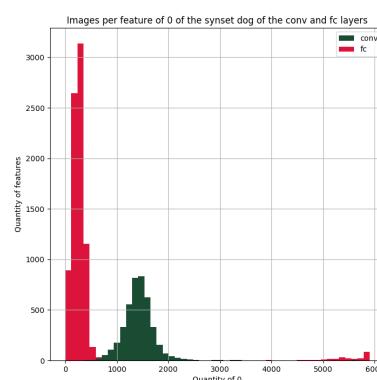
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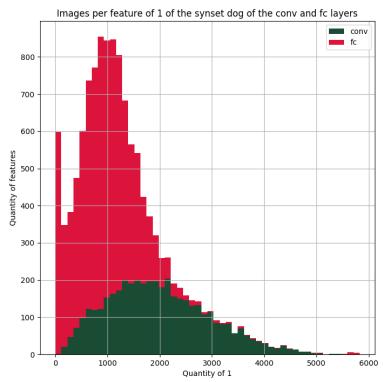
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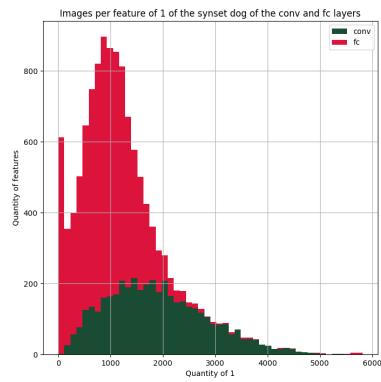
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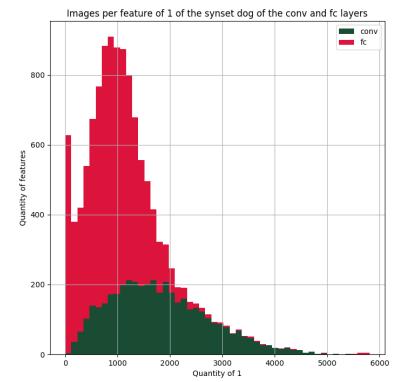
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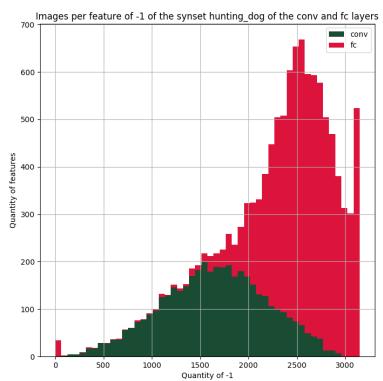
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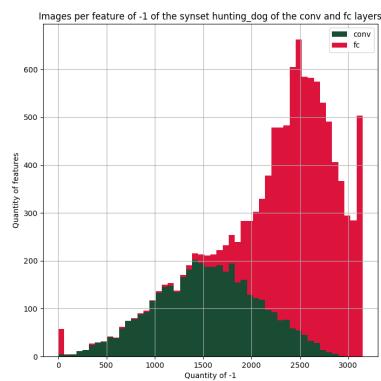
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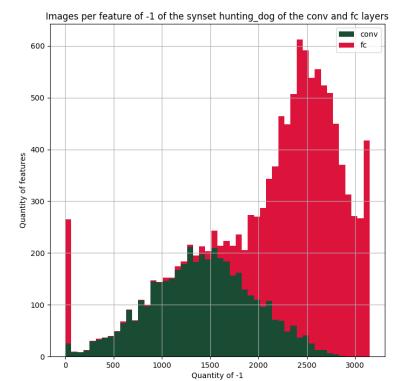
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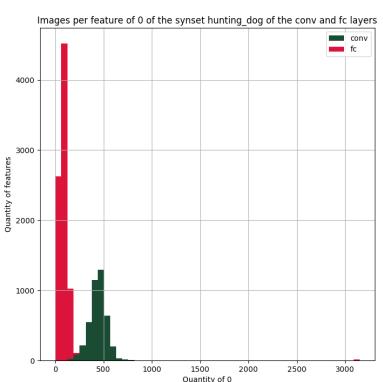
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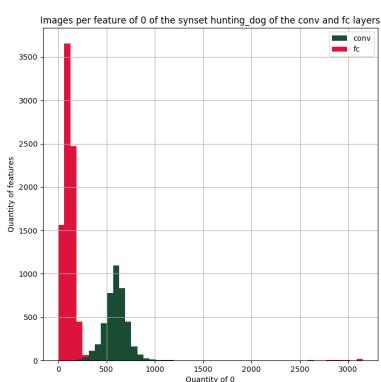
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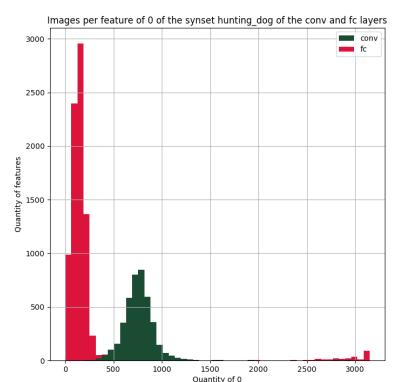
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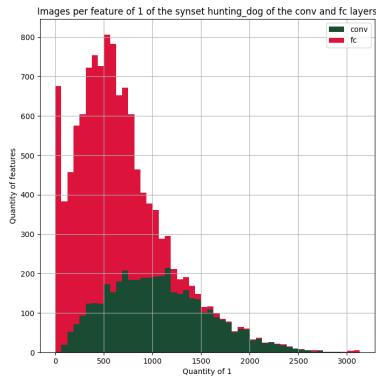
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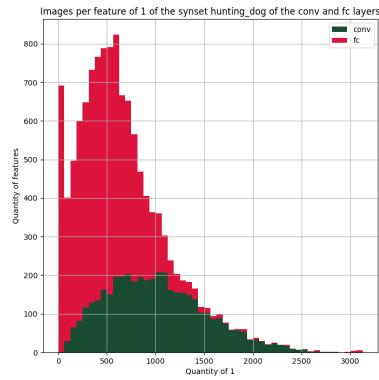
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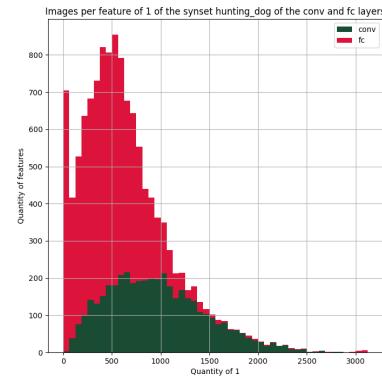
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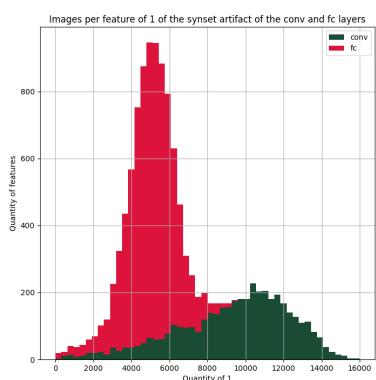
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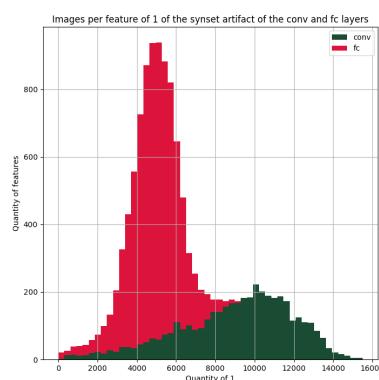
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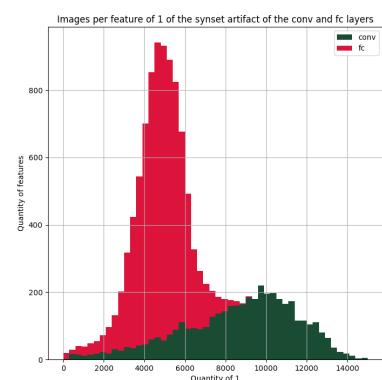
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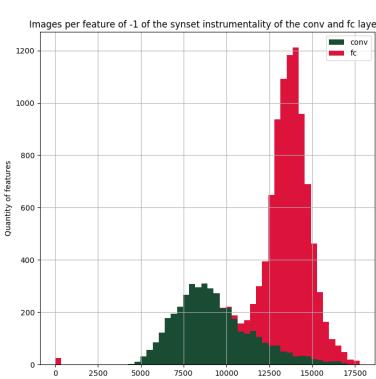
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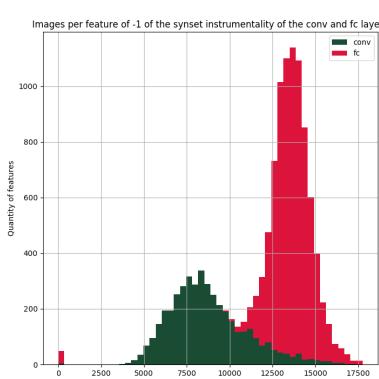
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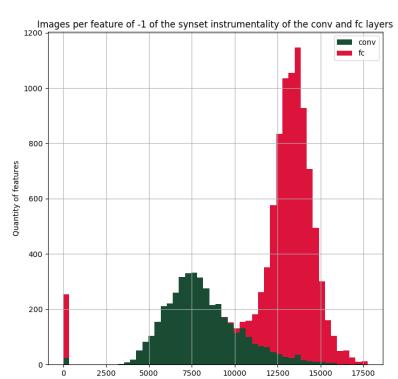
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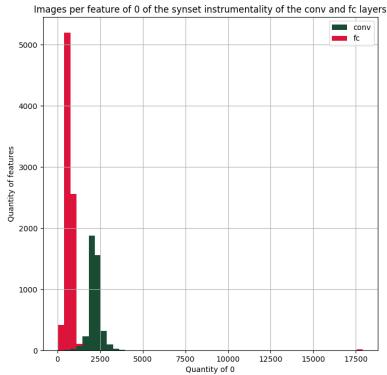
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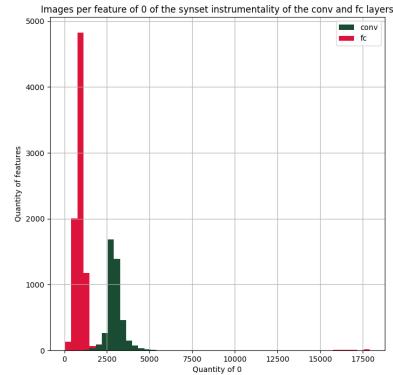
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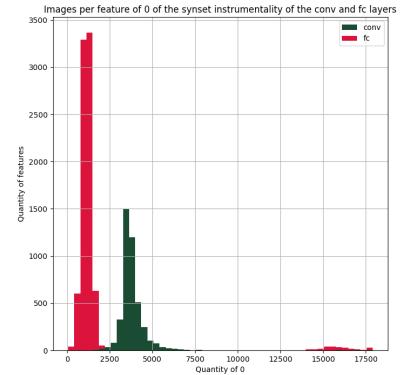
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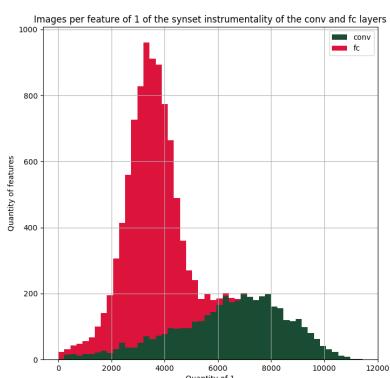
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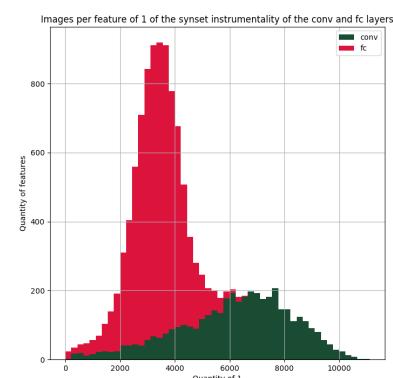
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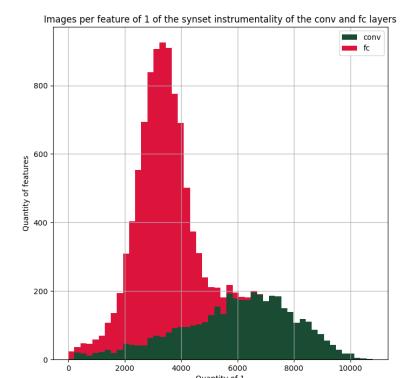
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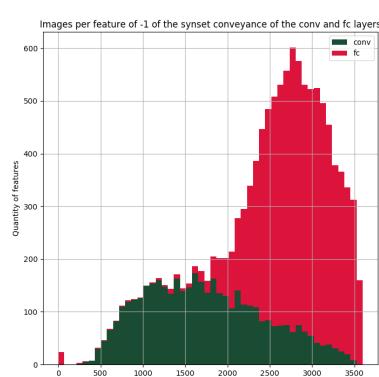
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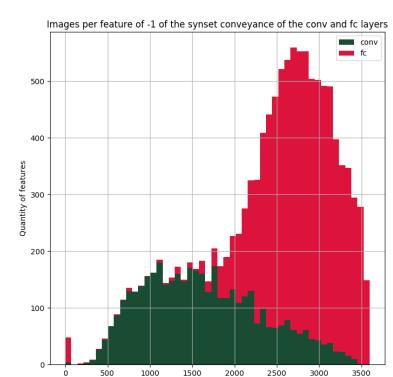
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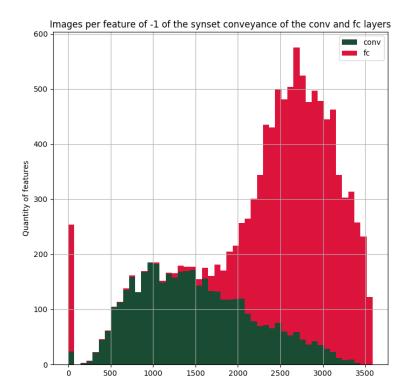
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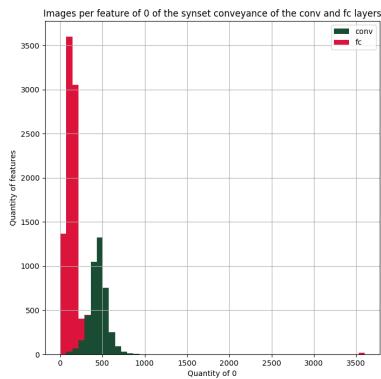
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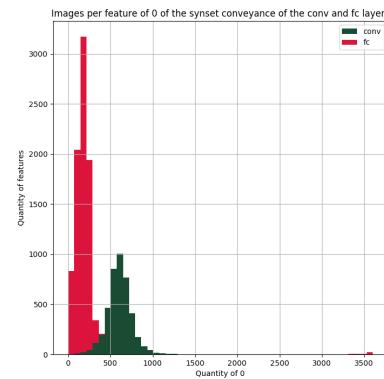
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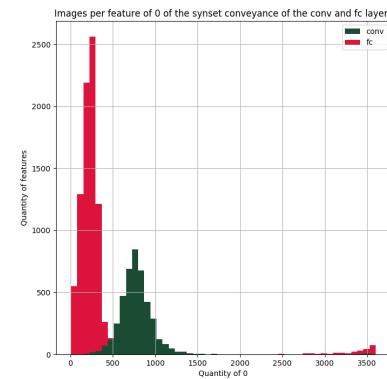
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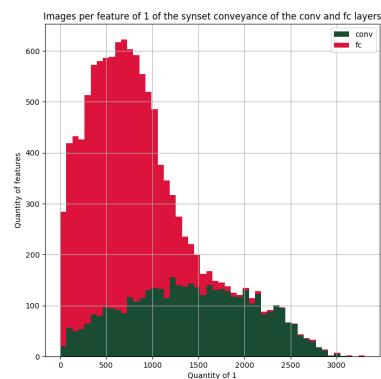
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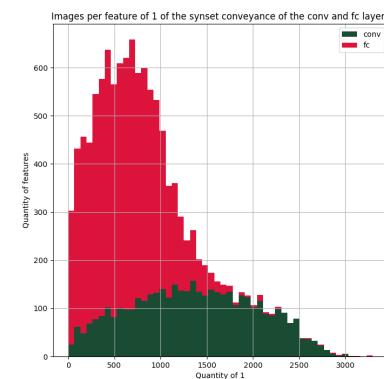
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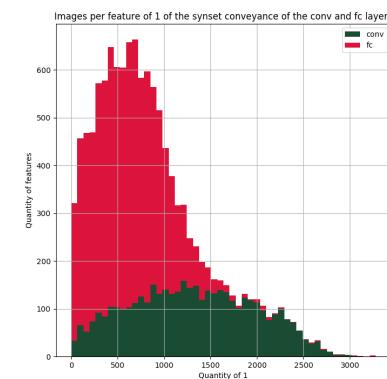
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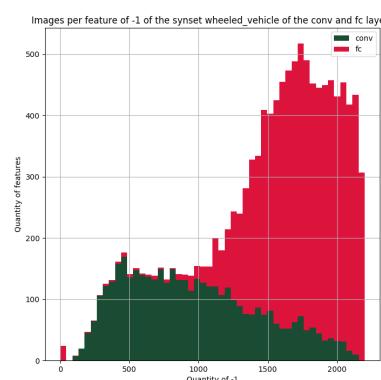
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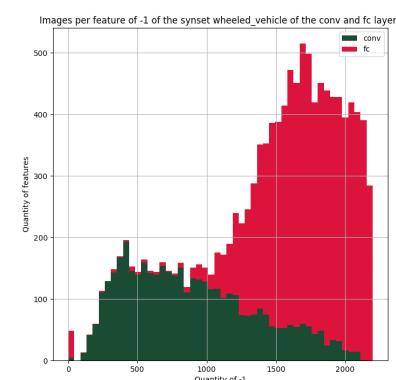
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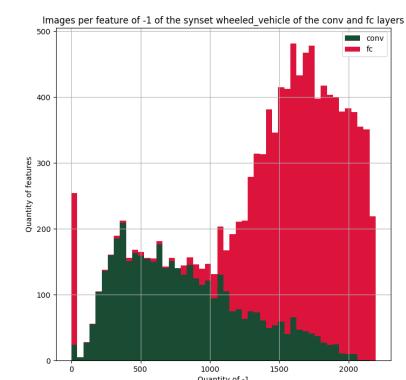
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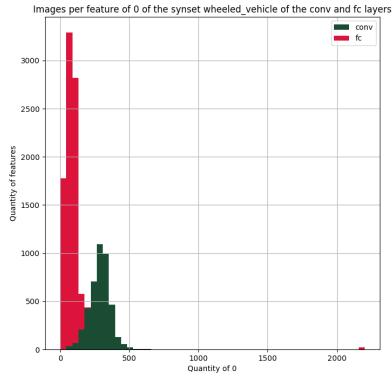
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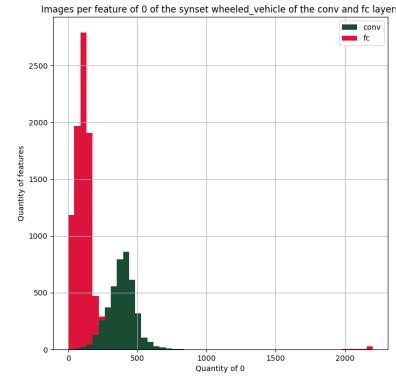
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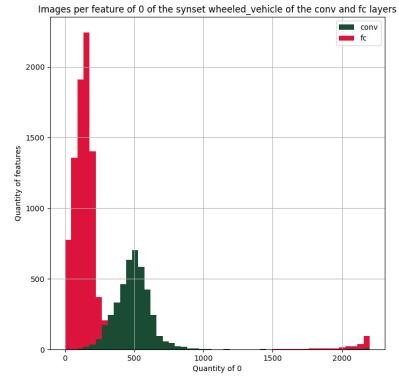
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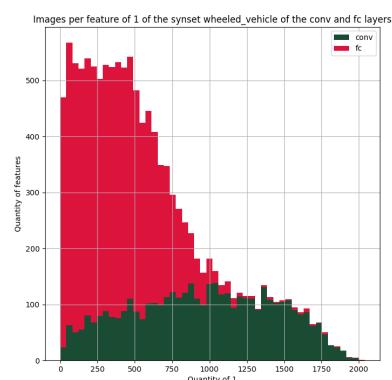
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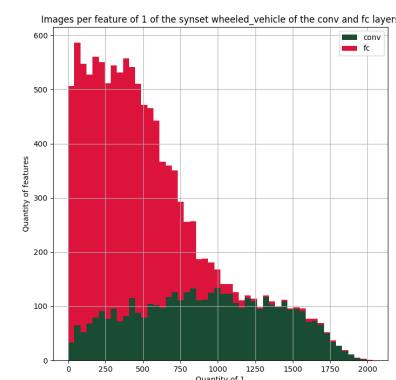
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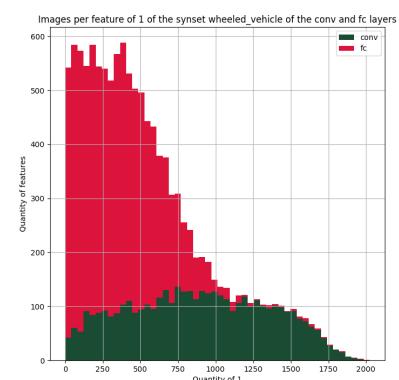
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Embedding 31

## 2.8 Comprobación de que las cosas tienen sentido

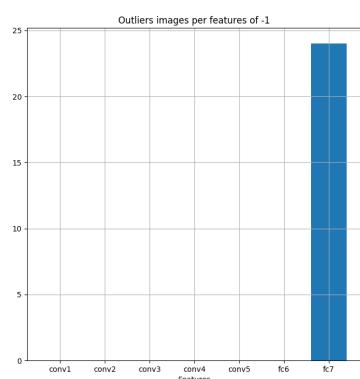
- Hay alguna imagen que no tenga ninguna feature con valor cero? No, ninguna

- Hay algún synset que tenga valor 1 y -1 para la misma feature? Si, bastantes. Estamos tomando:

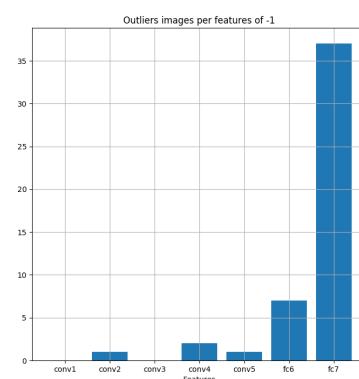
La feature tiene el valor i para el synset si lo tiene para alguna imagen del synset(Estamos estudiando la submatriz correspondiente al synset)

## 2.9 Estudio de los outliers de imágenes por feature

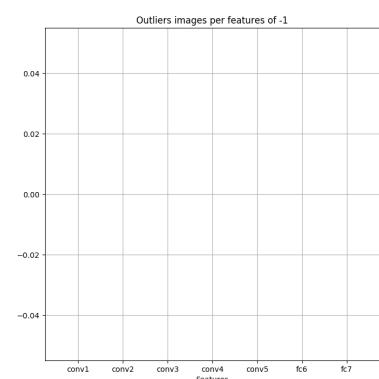
### 2.9.1 Living Things



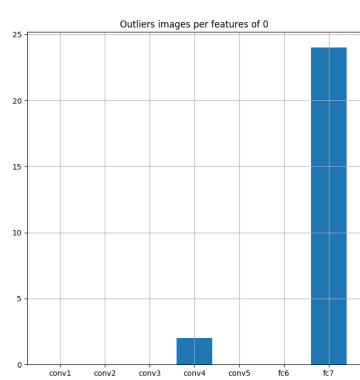
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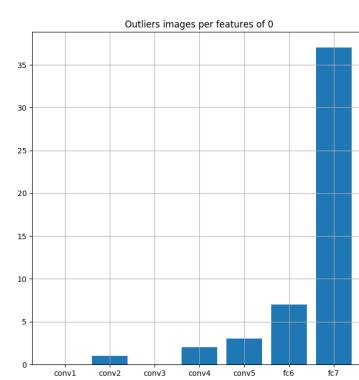
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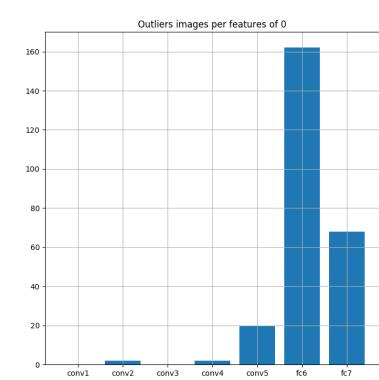
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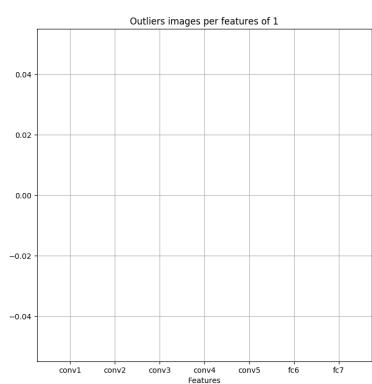
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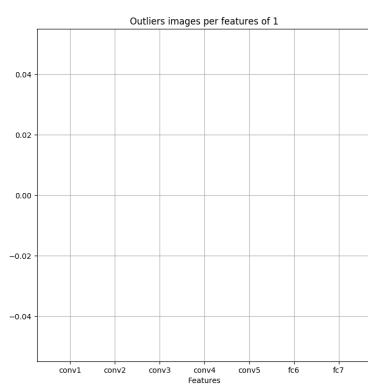
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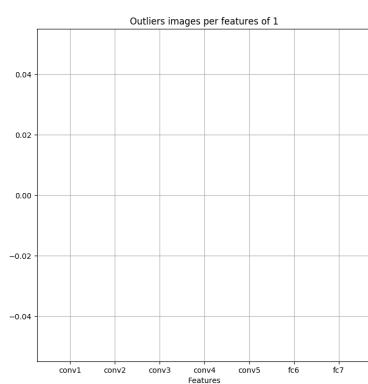
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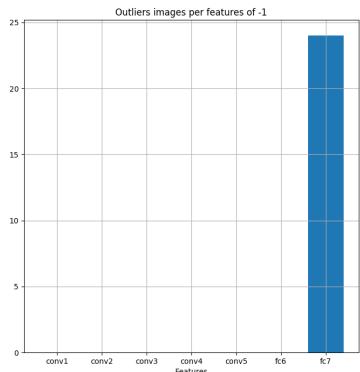


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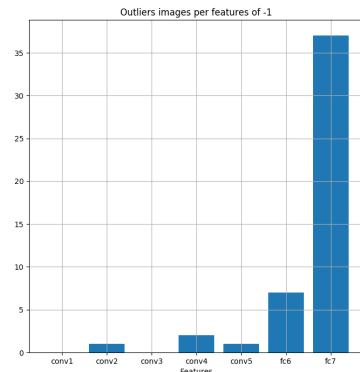


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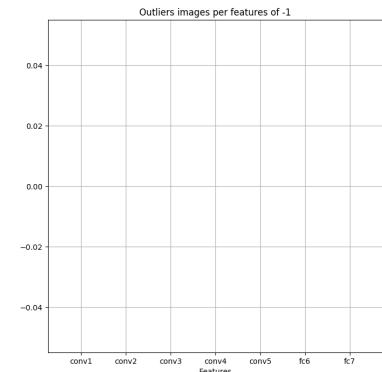
## 2.9.2 Non living Things



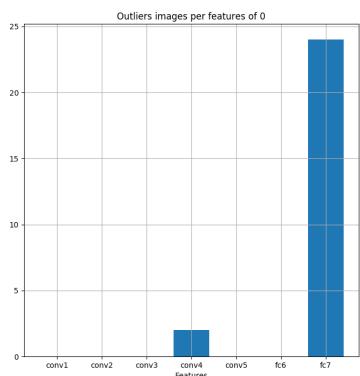
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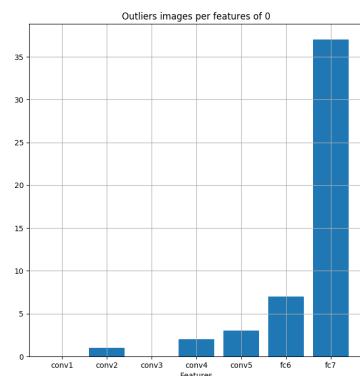
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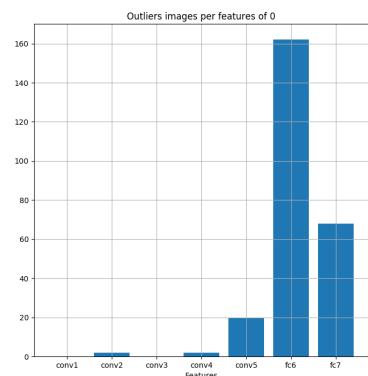
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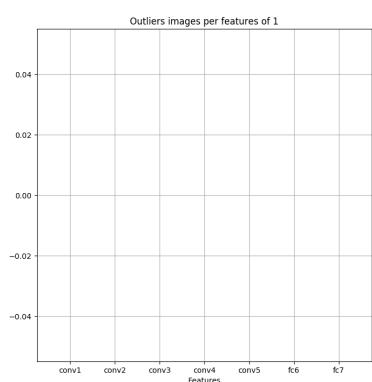
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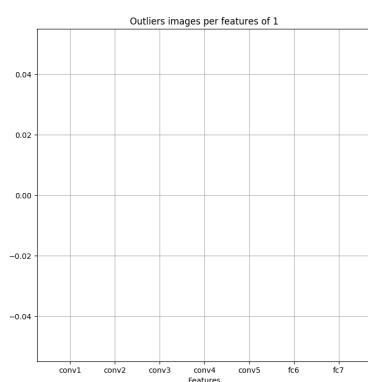
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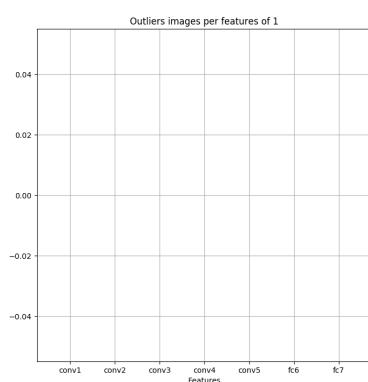
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Embedding 25



Embedding 31

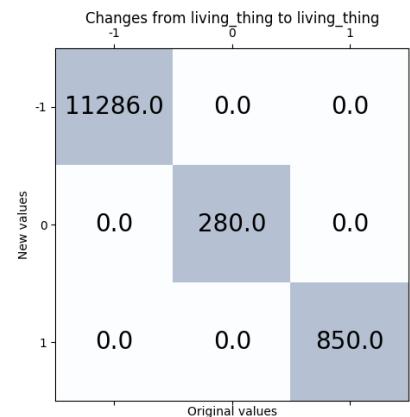
## 2.10 Matrices de cambio



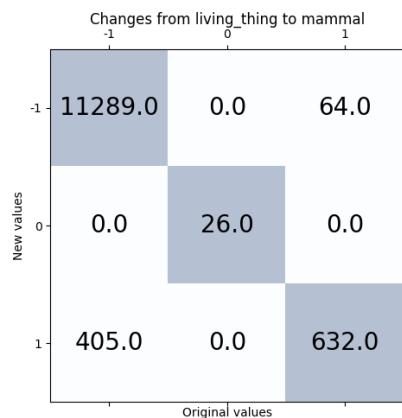
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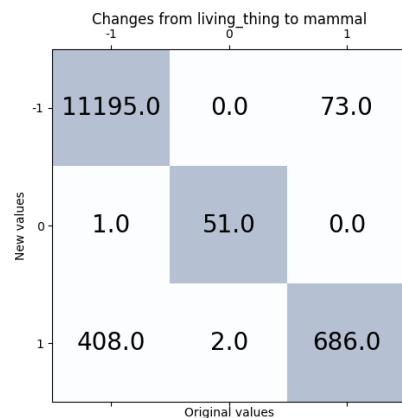
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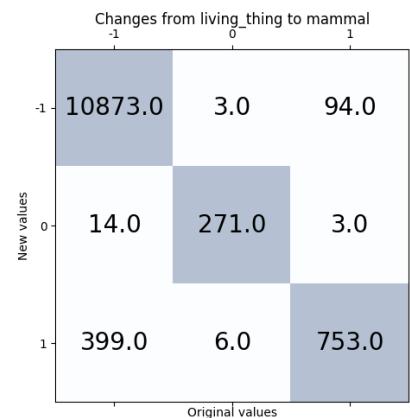
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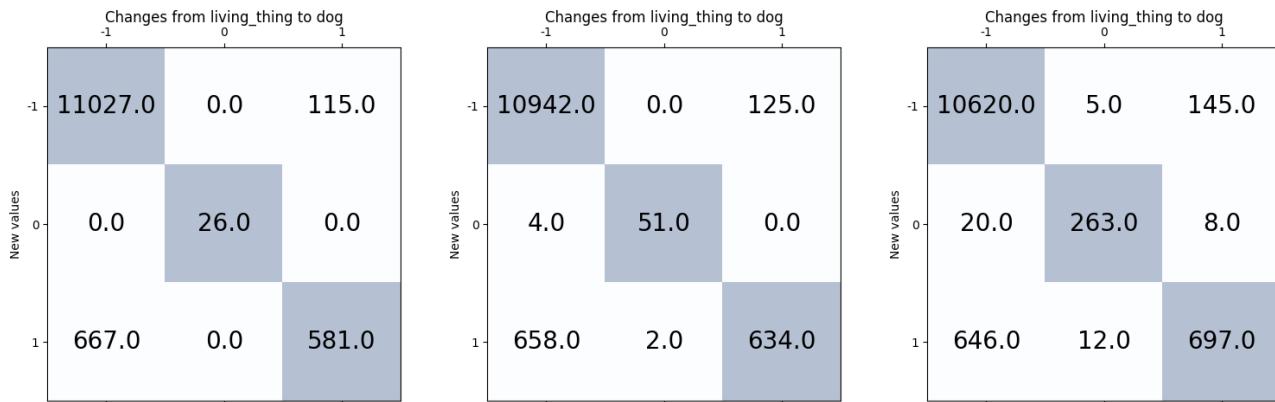
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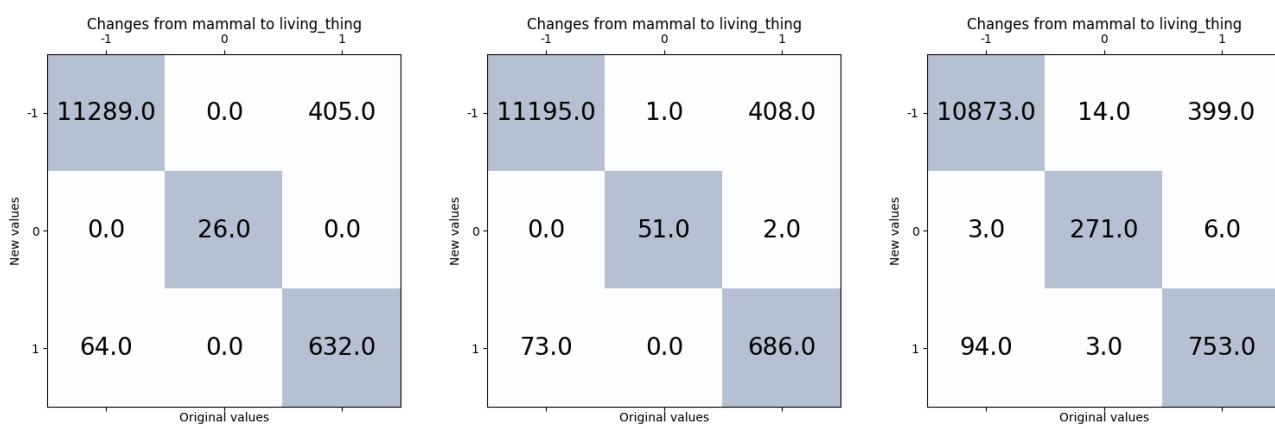
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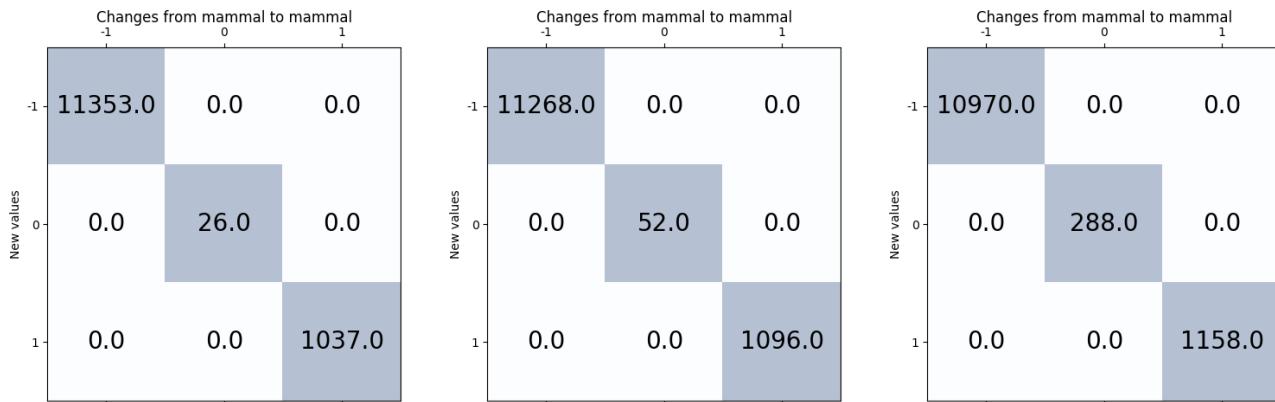
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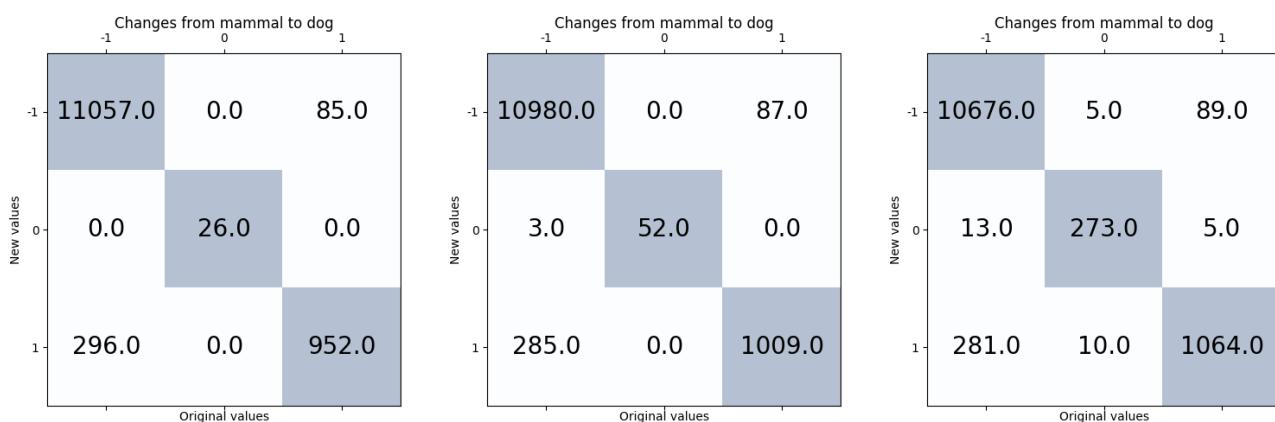
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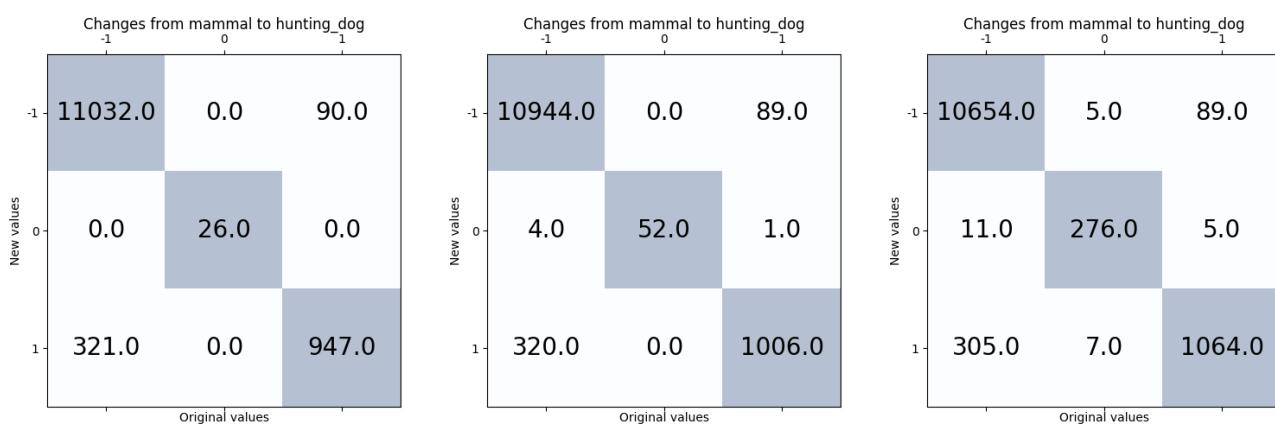
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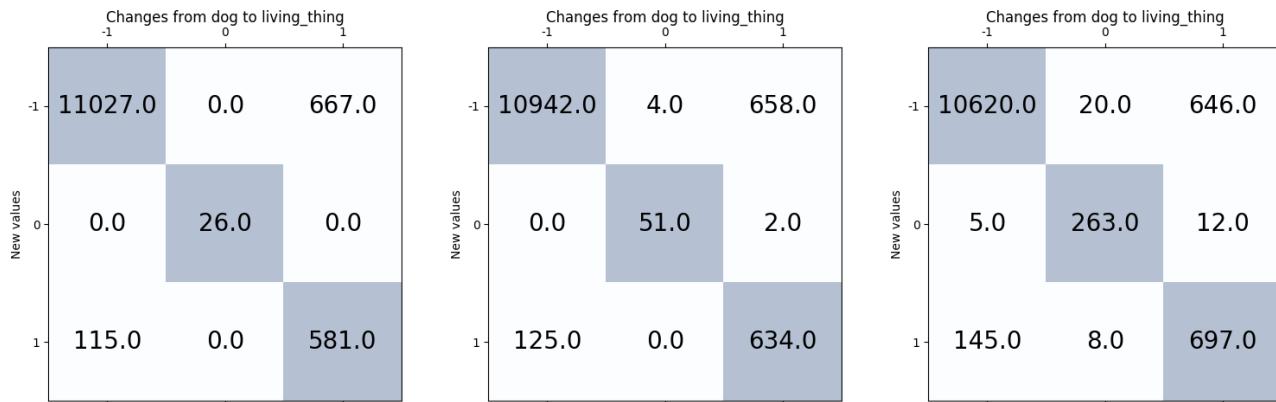
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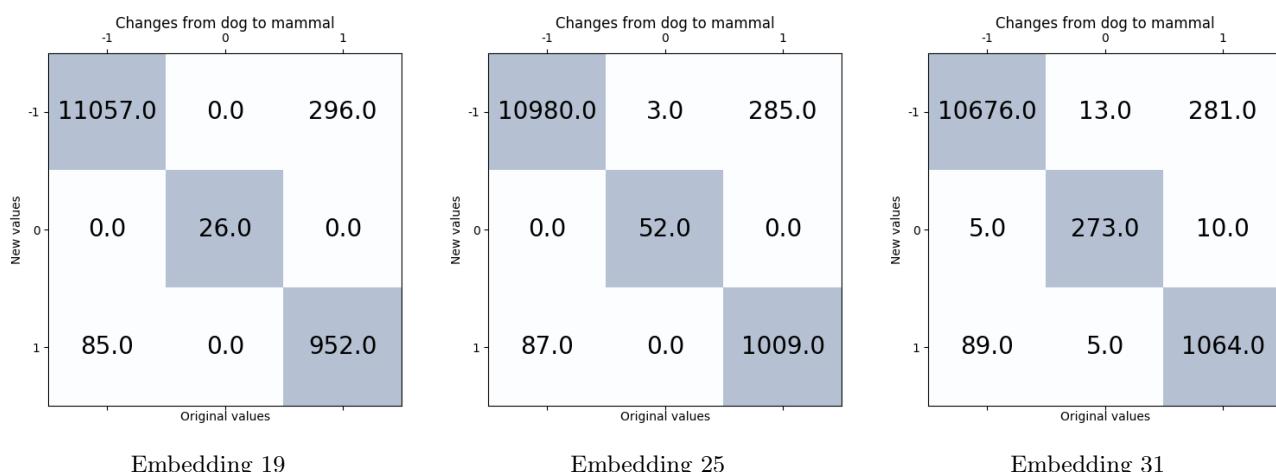
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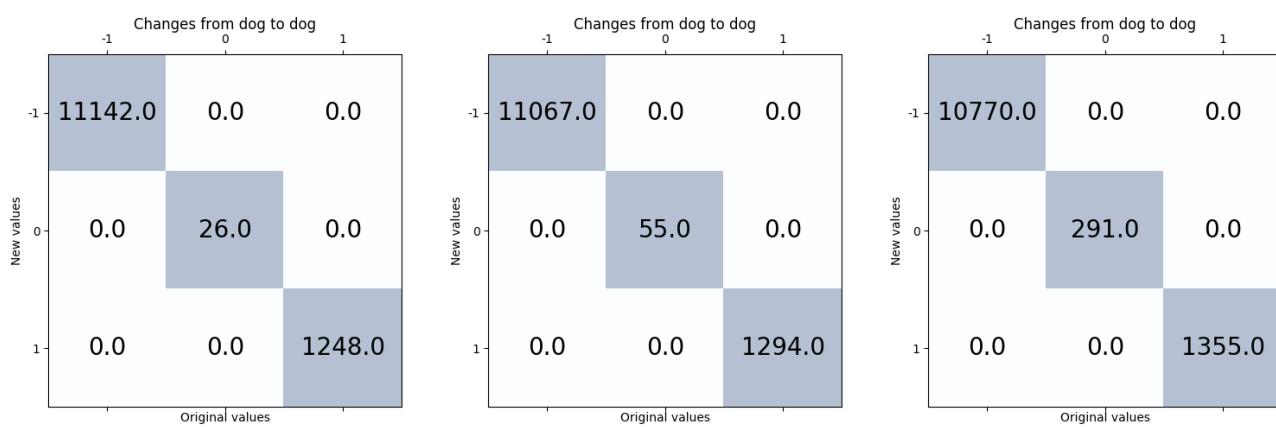
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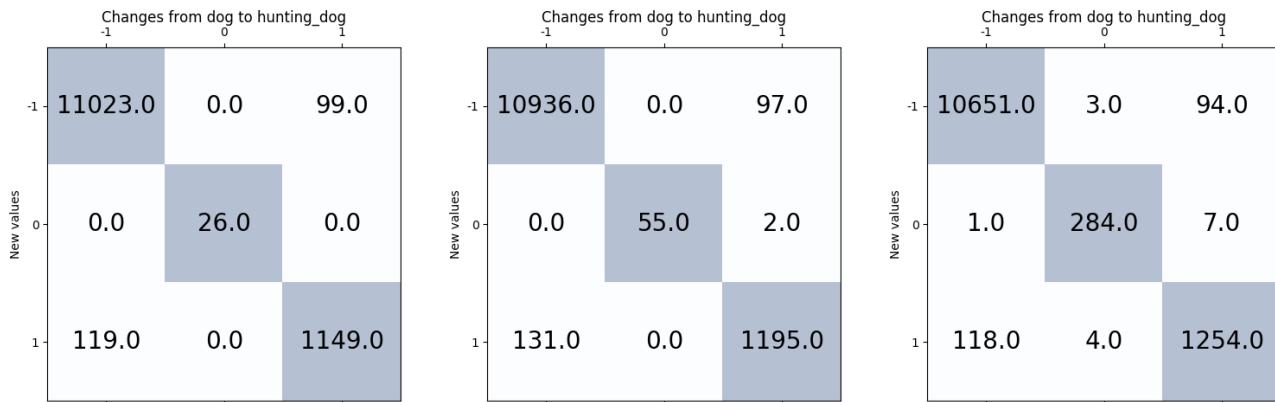
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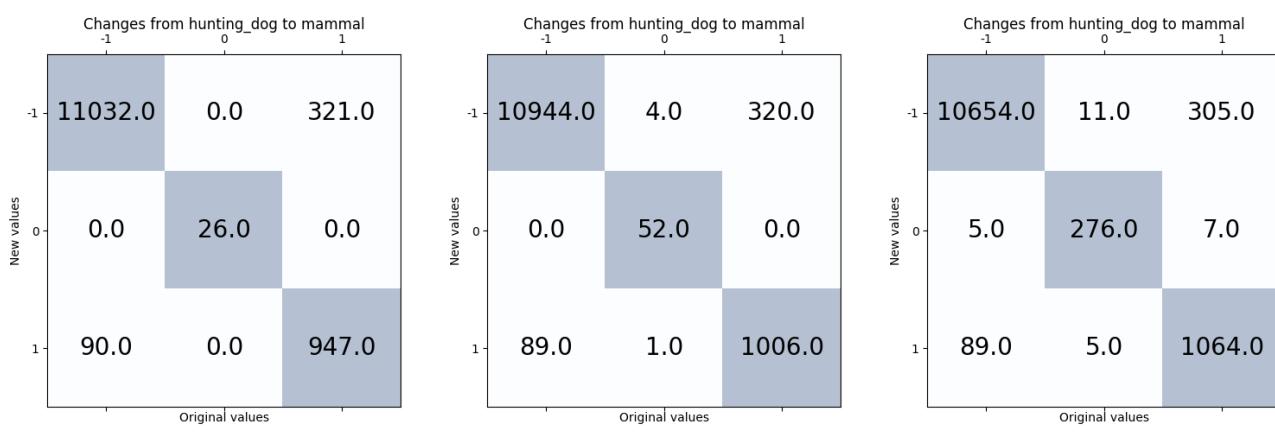
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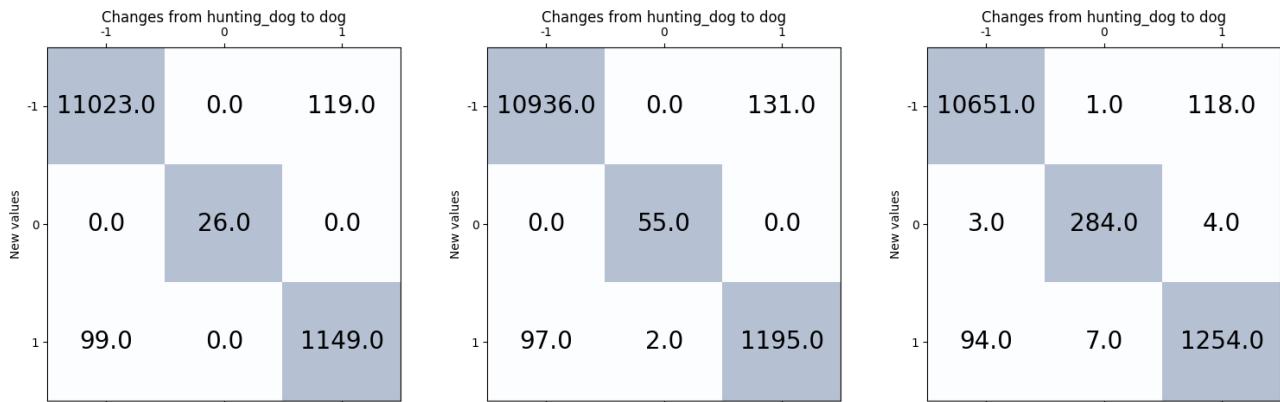
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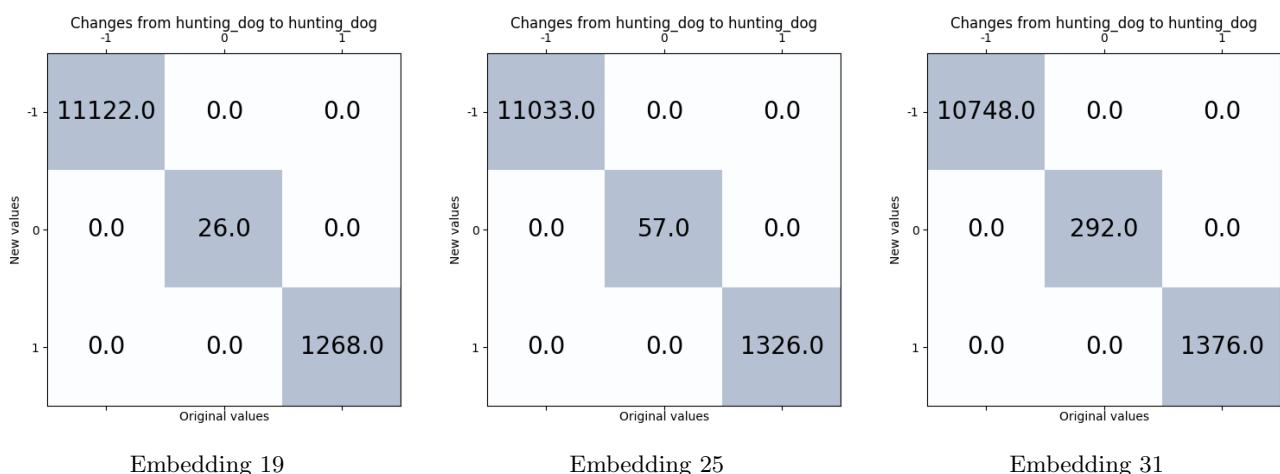
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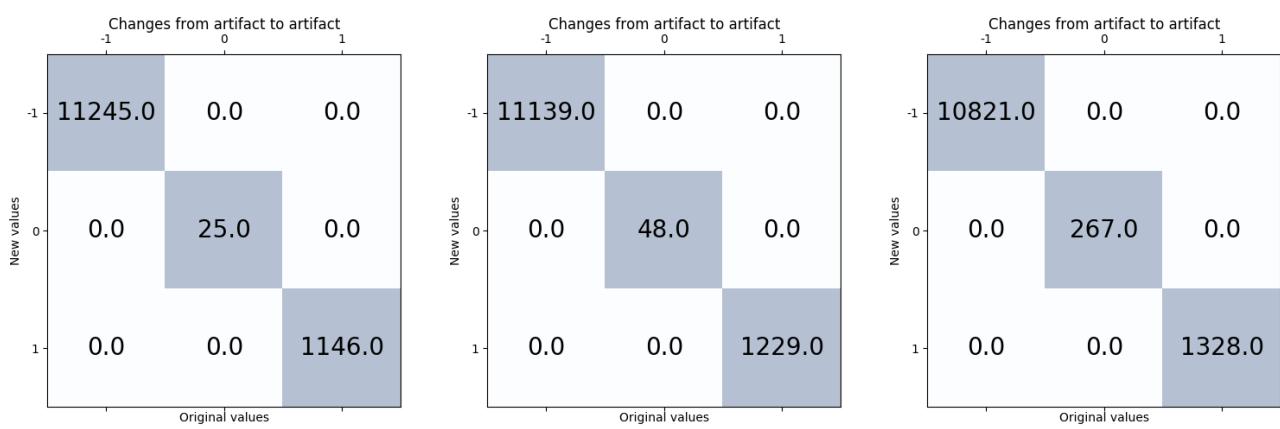
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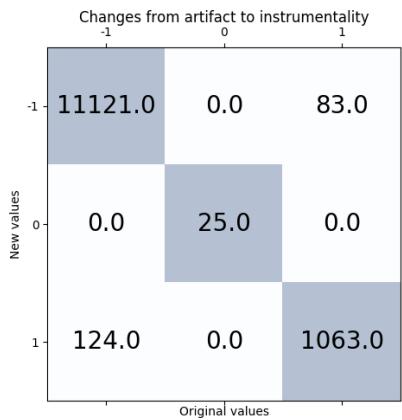
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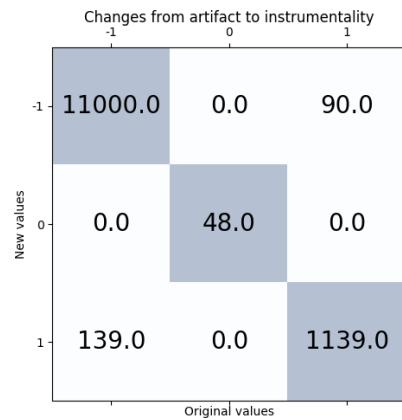
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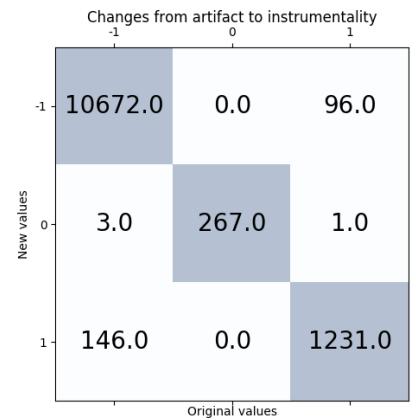
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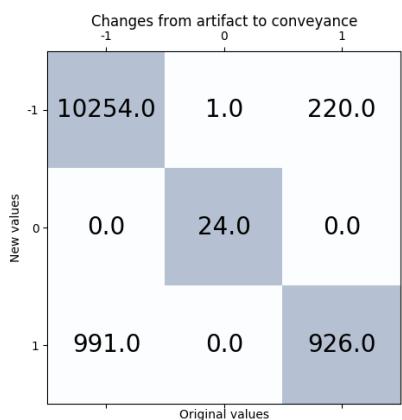
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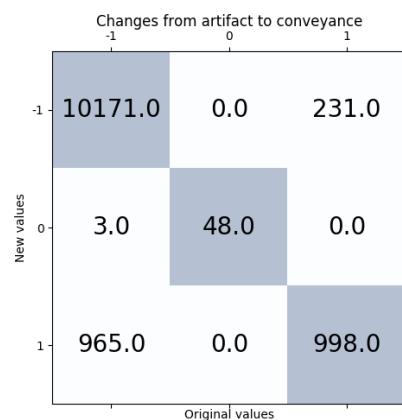
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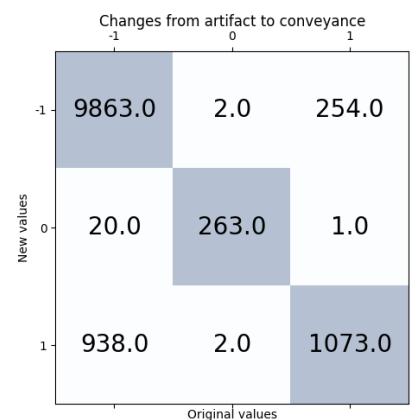
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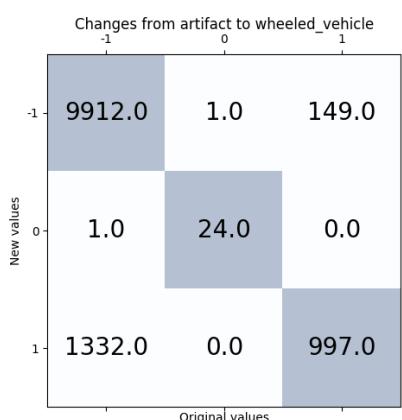
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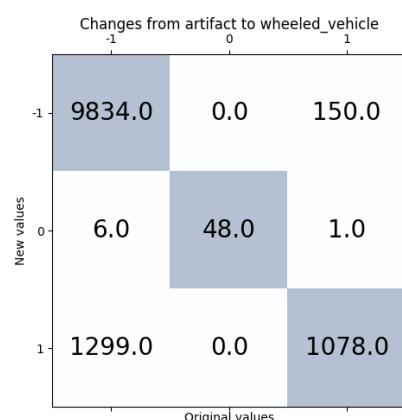
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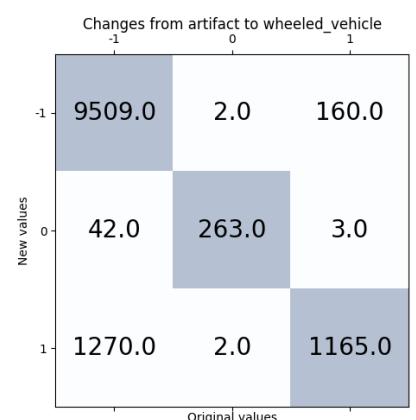
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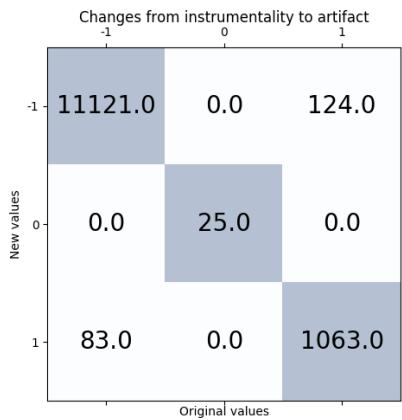
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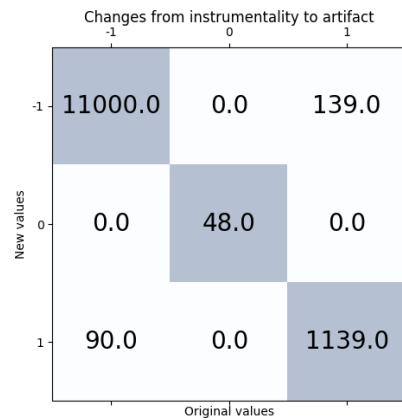
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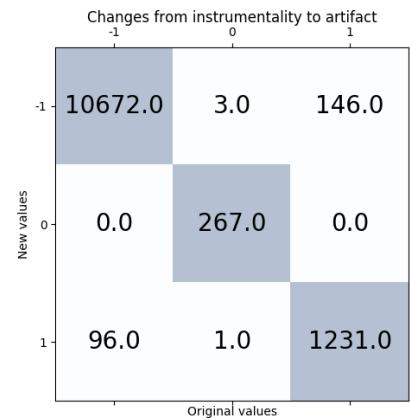
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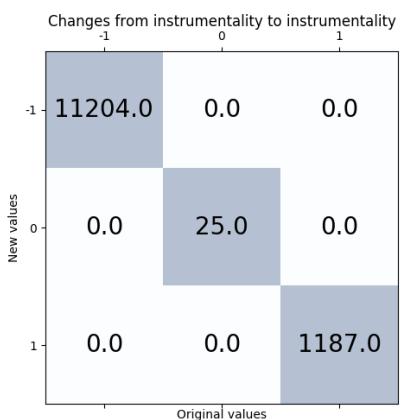
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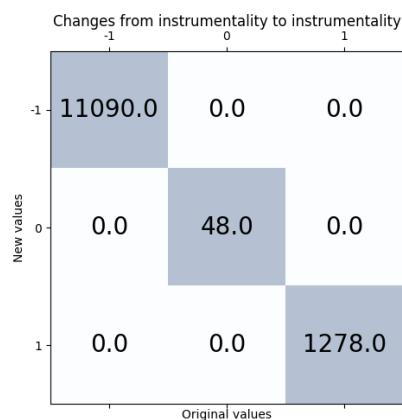
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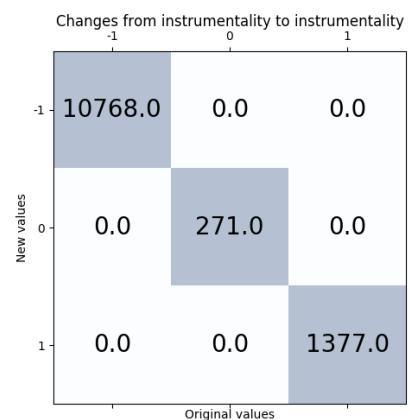
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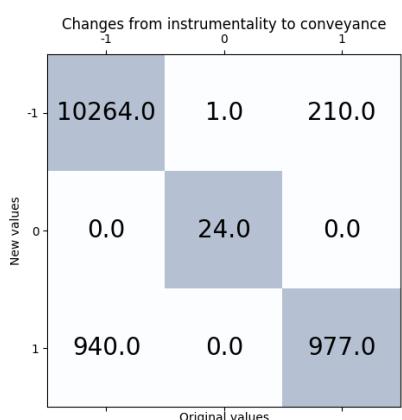
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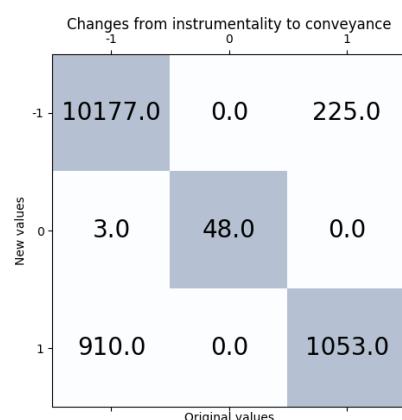
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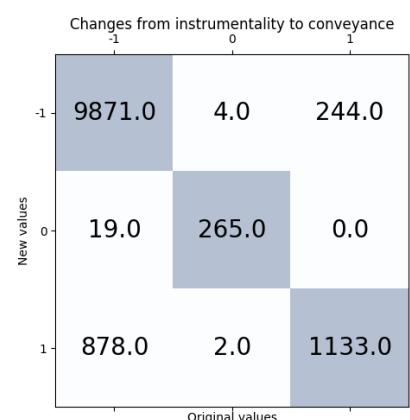
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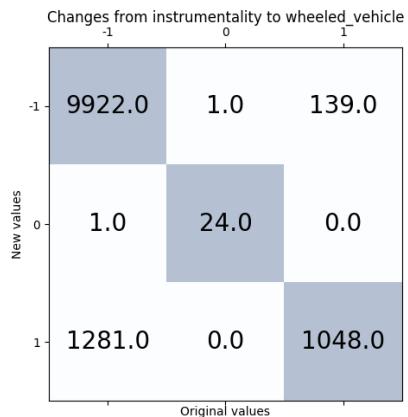
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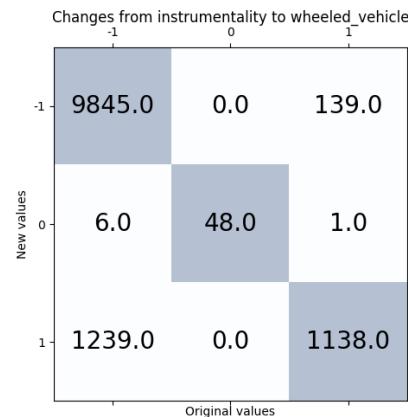
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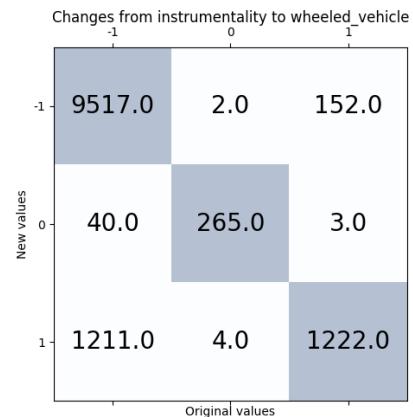
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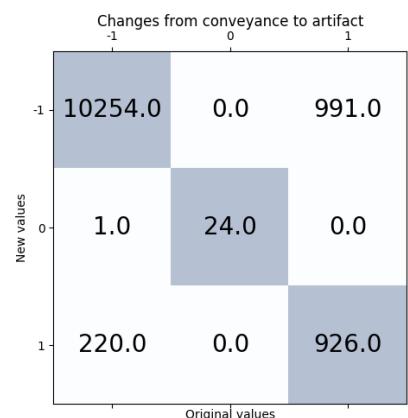
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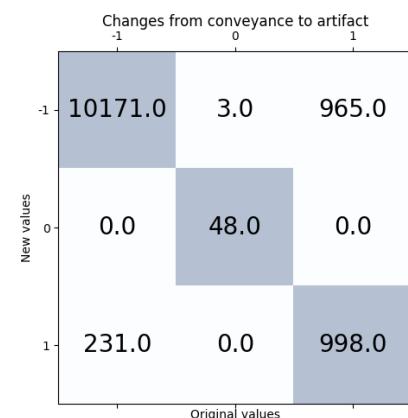
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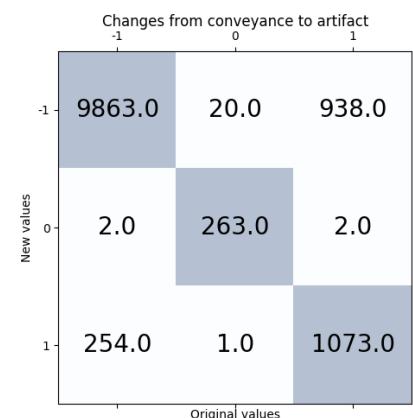
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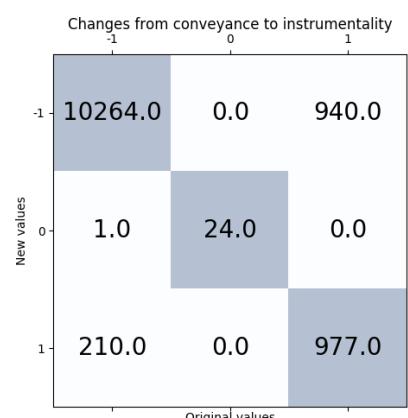
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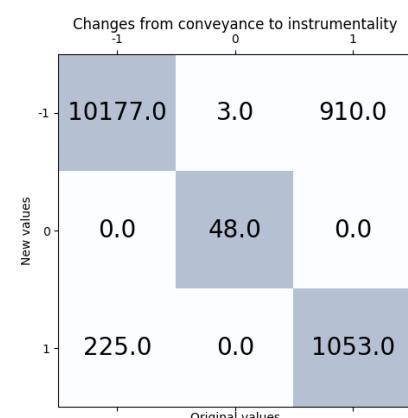
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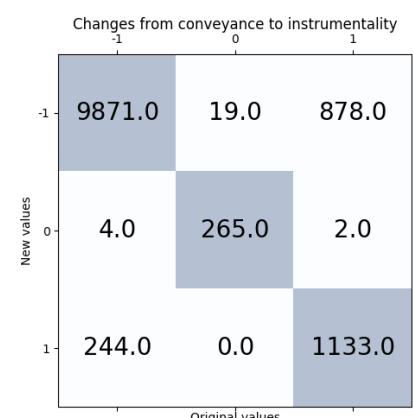
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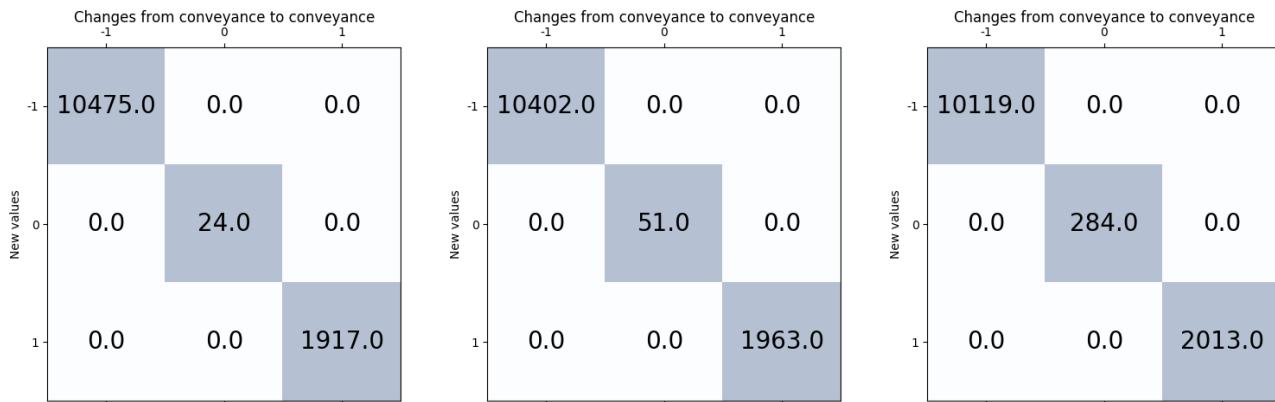
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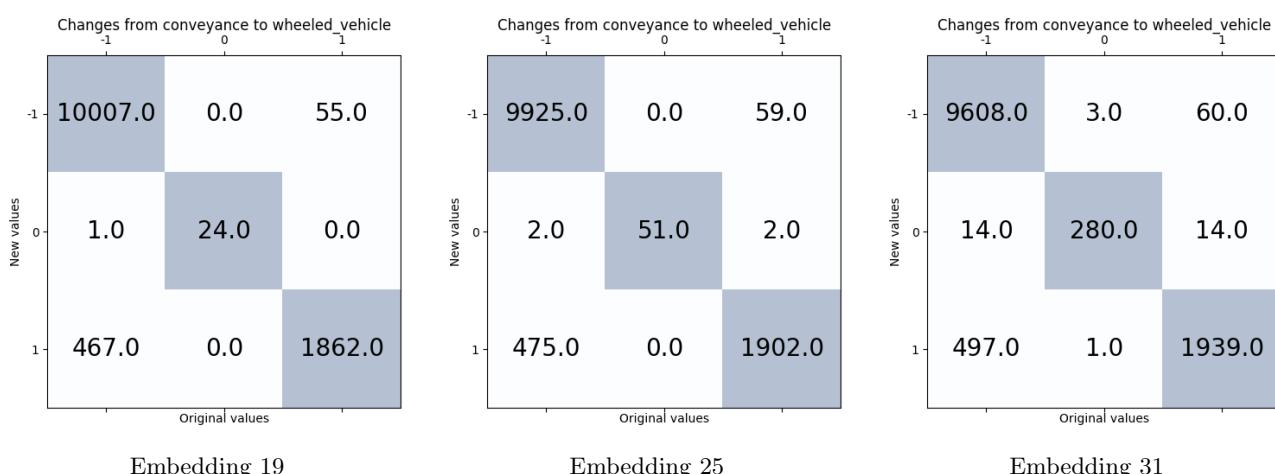
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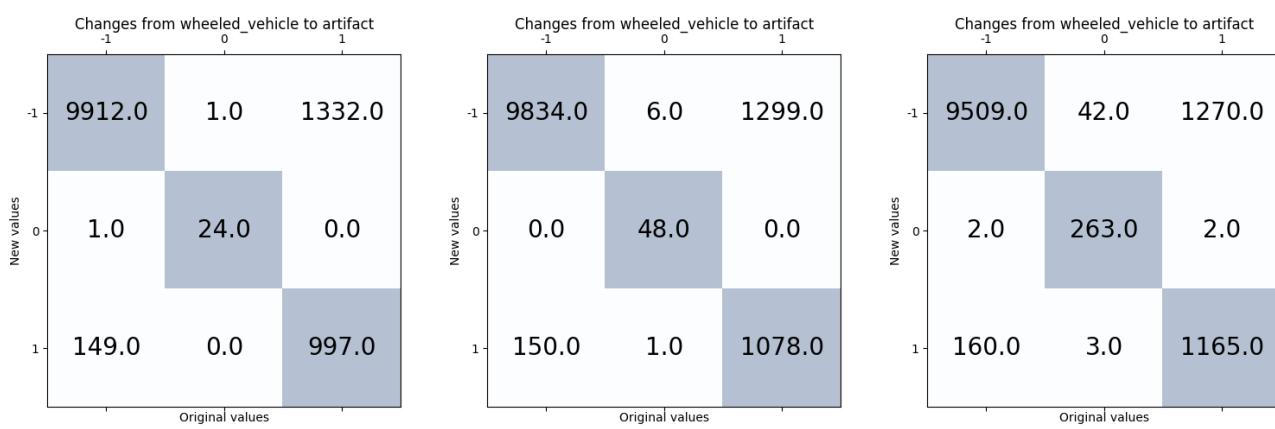
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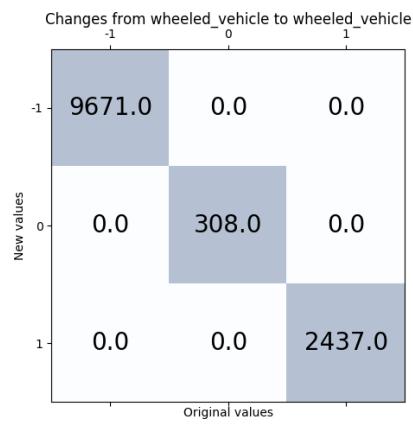
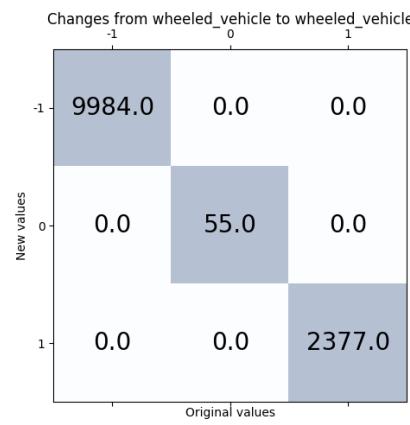
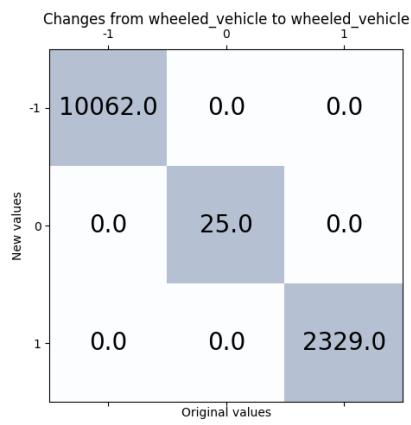
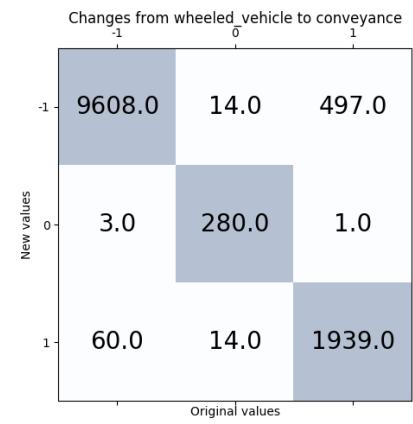
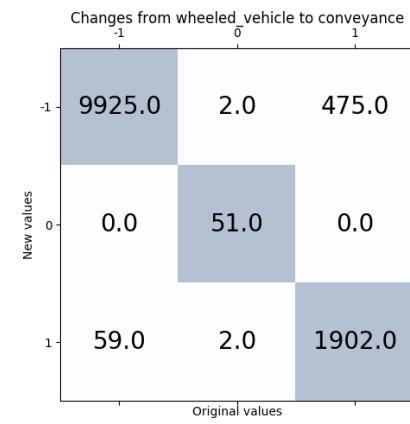
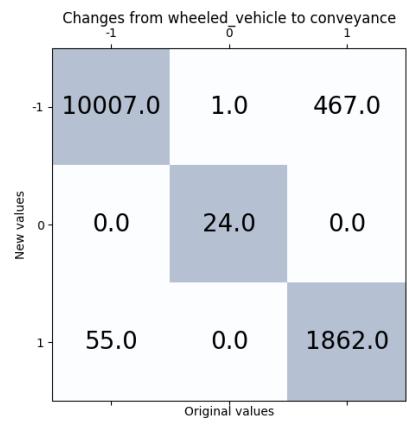
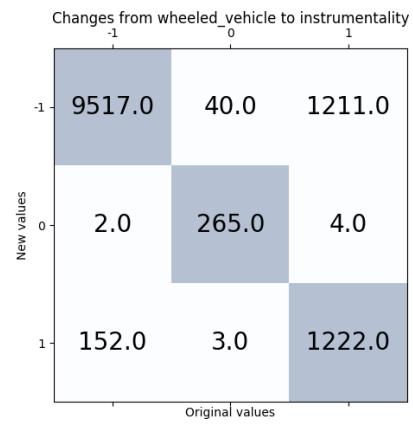
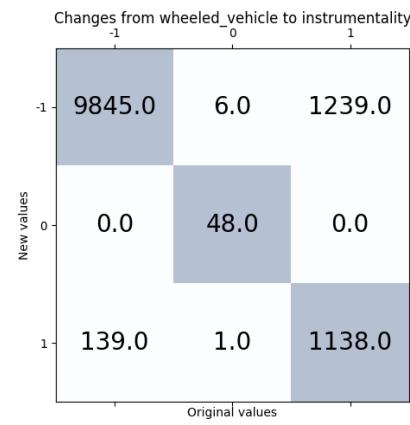
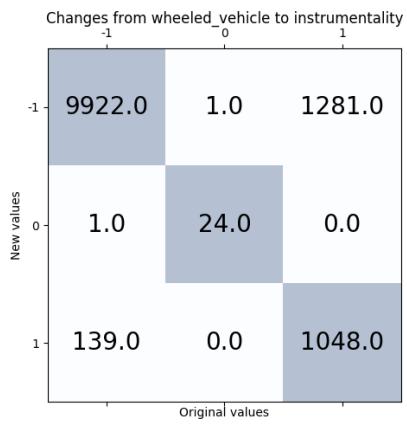
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