

TFG informe inicial

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November 9, 2017

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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, co
- **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
```

```

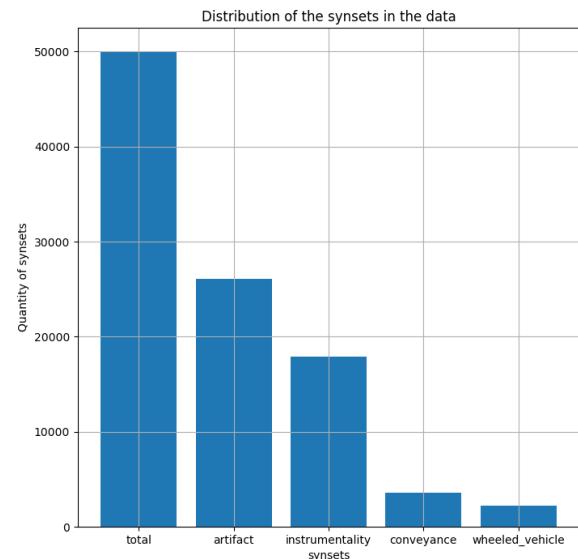
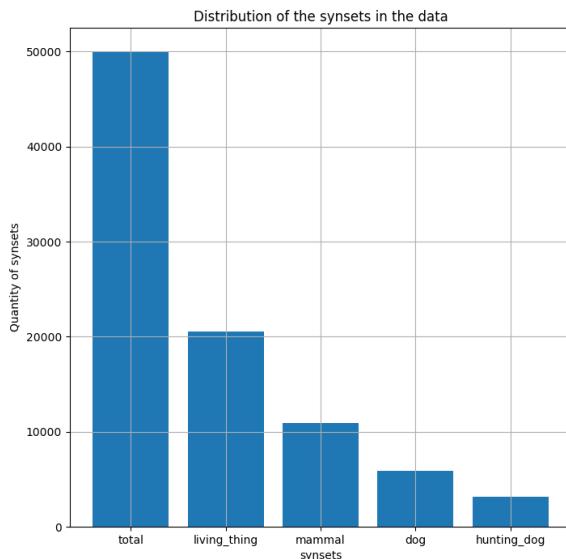
'fc7': [8320, 12416], # 15
'conv1': [0, 128], # 16
'conv2': [128, 384], # 17
'conv3': [384, 1152], # 18
'conv4': [1152, 2688], # 19
'conv5': [2688, 4224], # 20
'conv': [0, 4224], # 21
'2_5conv': [128, 4224], # 22
'fc6tofc7': [4224, 12416], # 23
# 'all':[0,12416] # 24
}
self.reduced_layers = {
    'conv1':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

```

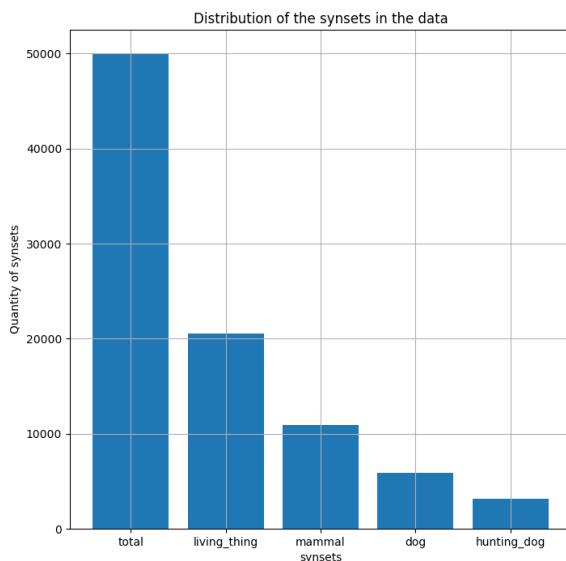
1.2 Generated Data

- **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** dfd
- **features_per_layer[synsets].pkldsf**
- **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].pklfdsfs**

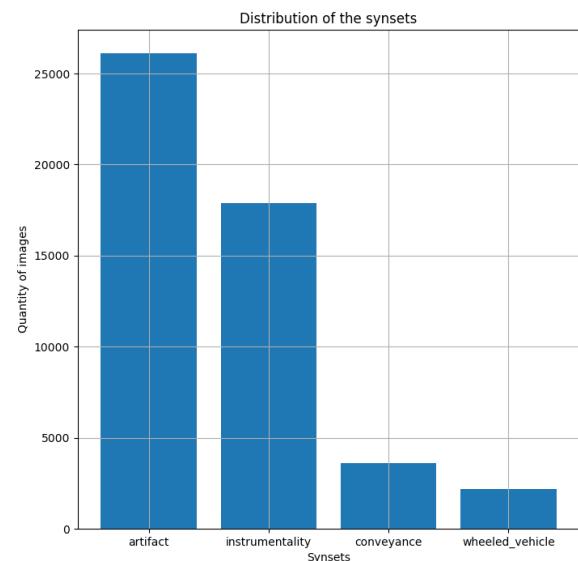
2 Análisis Base



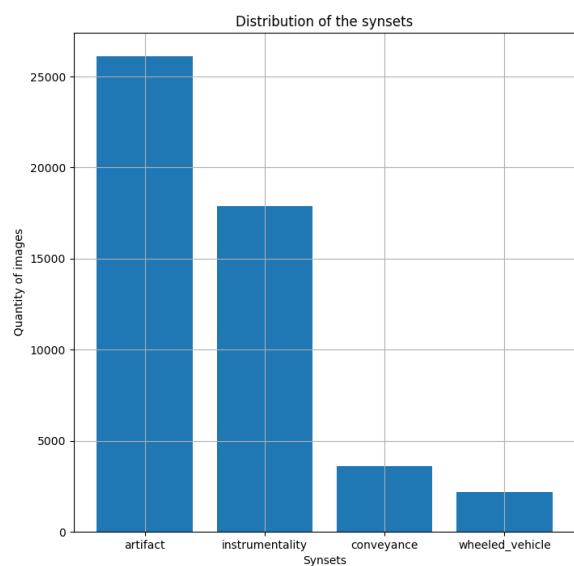
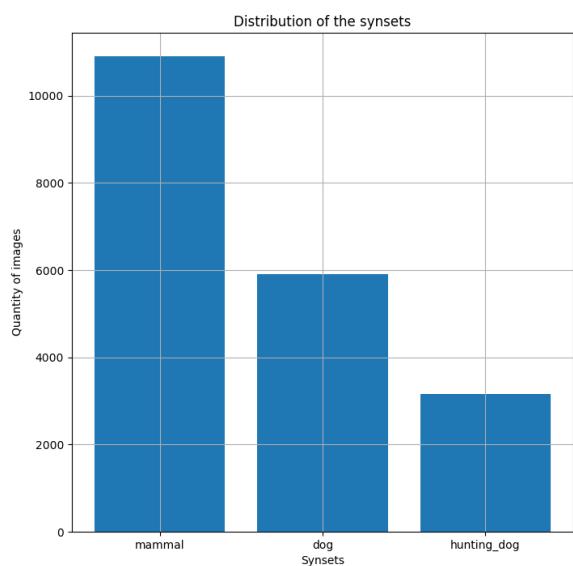
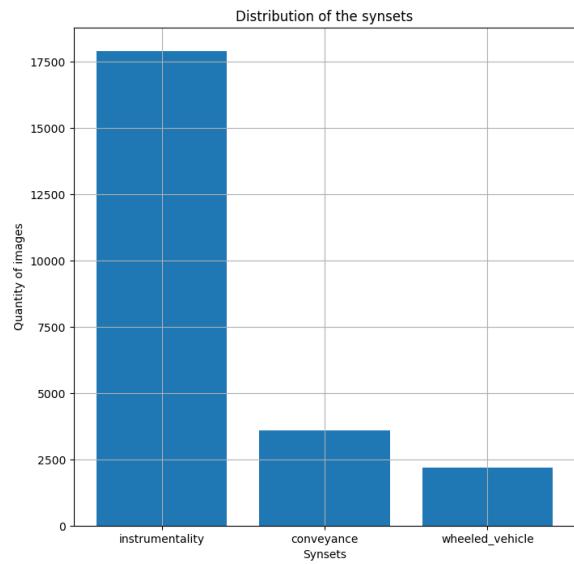
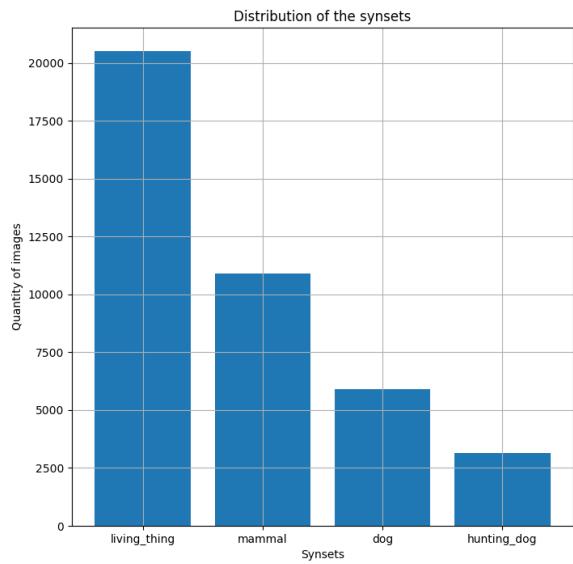
2.1 Intra sinset

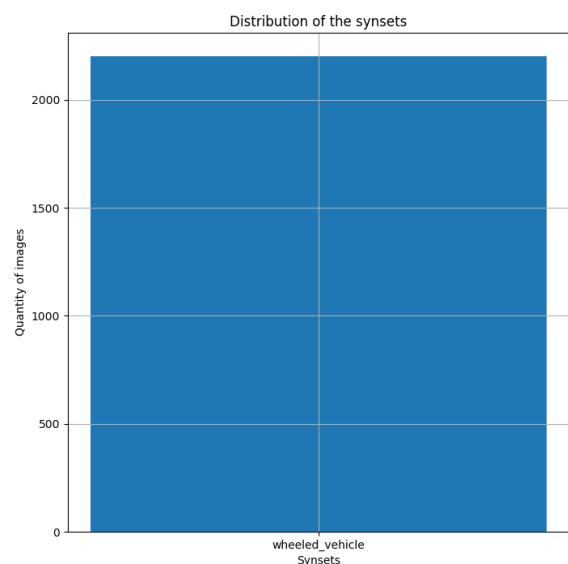
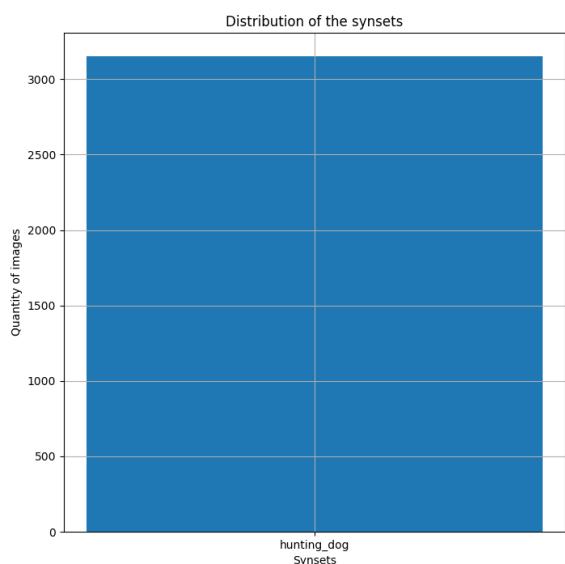
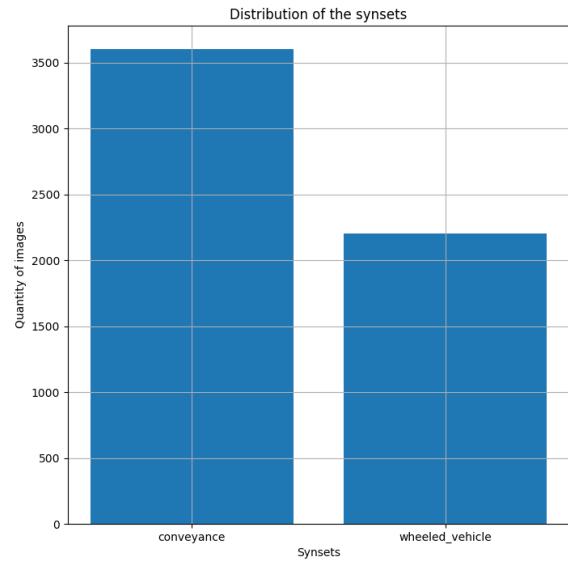
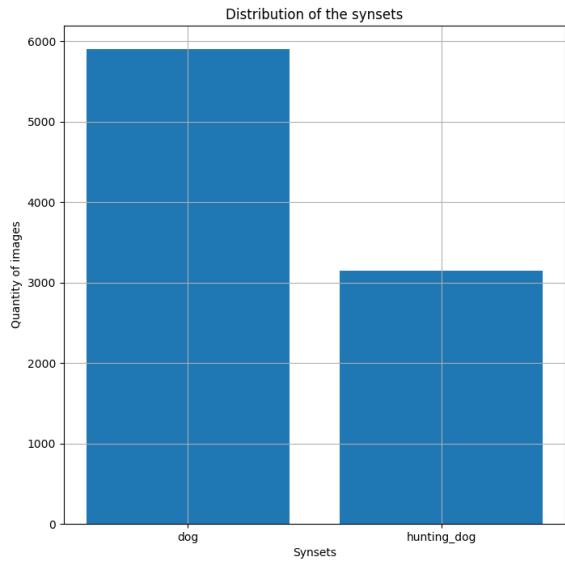


Living Things

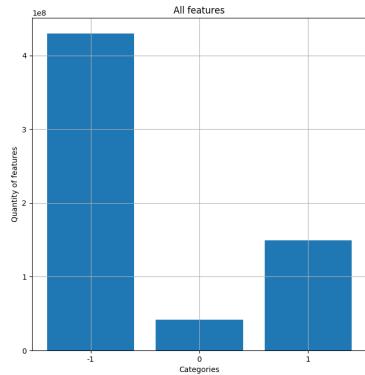


Non Living Things

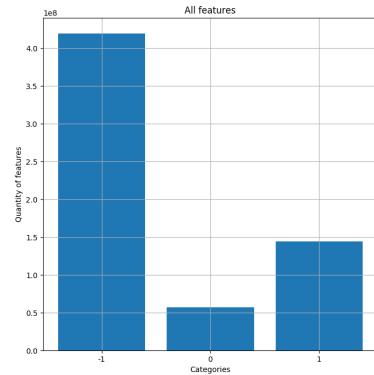




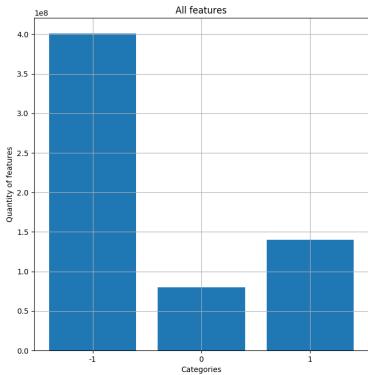
2.2 Distribución total de las features



Embedding 19

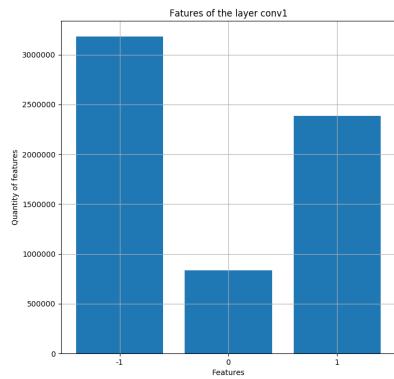


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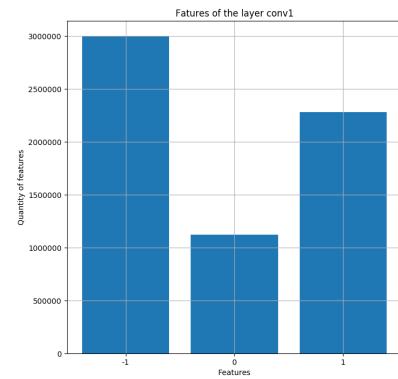


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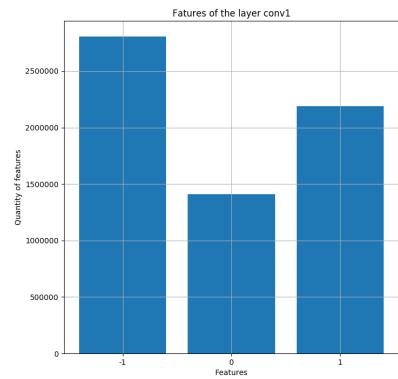
2.3 Distribución de las features por layer



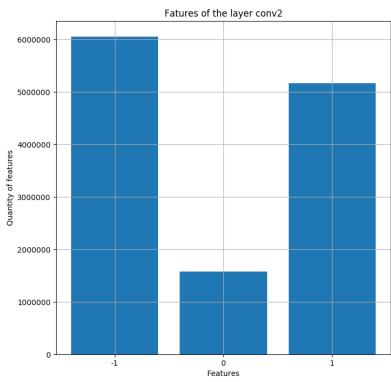
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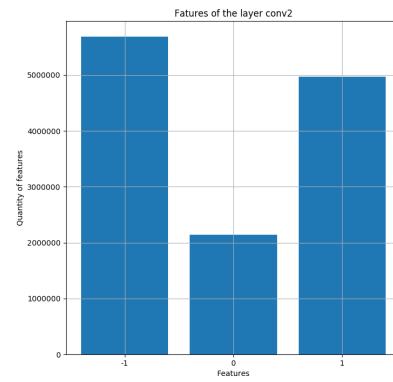
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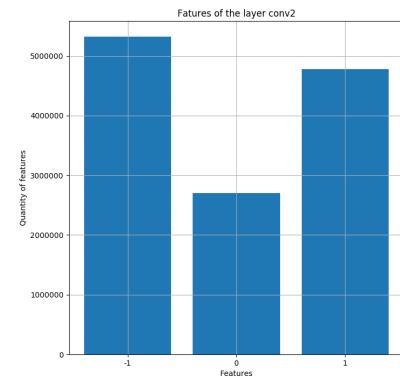
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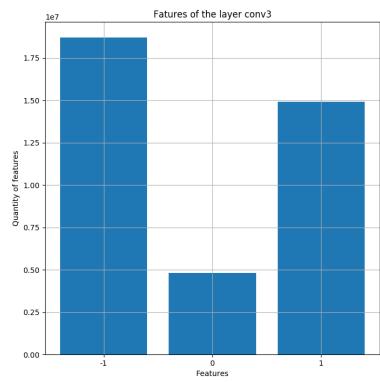
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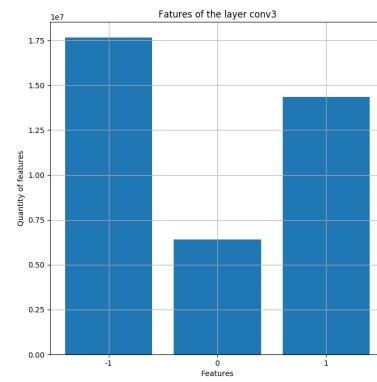
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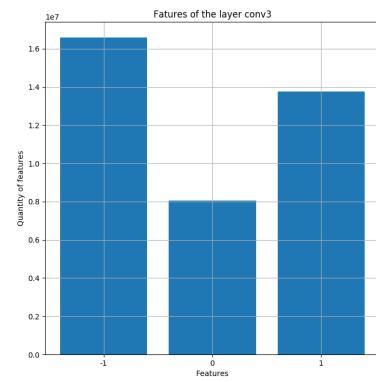
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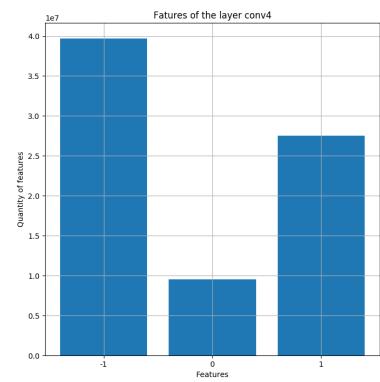
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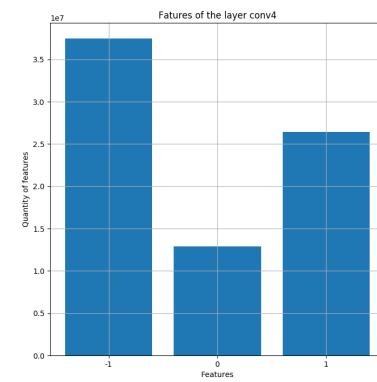
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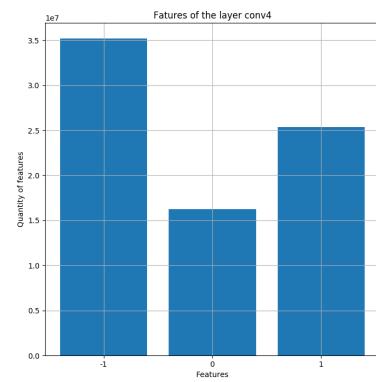
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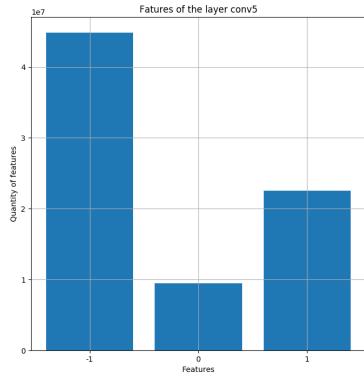
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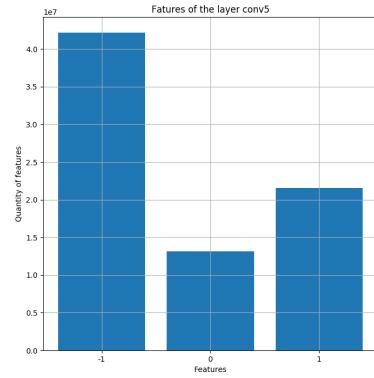
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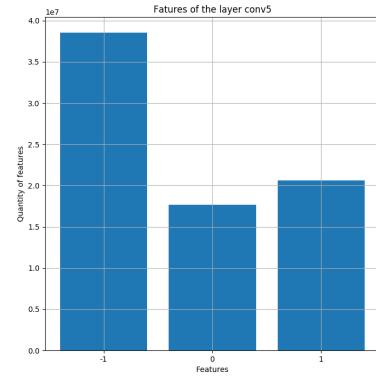
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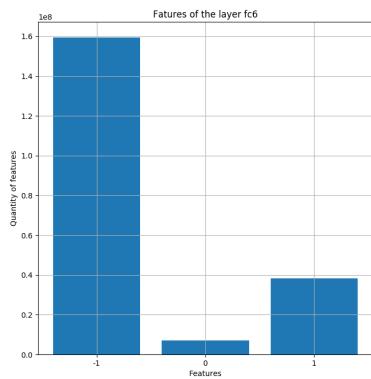
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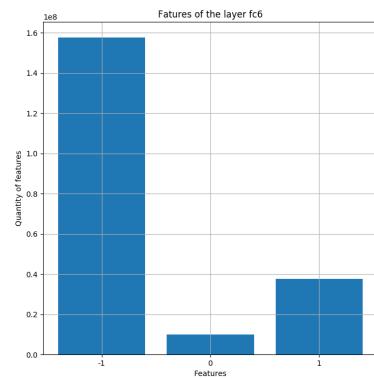
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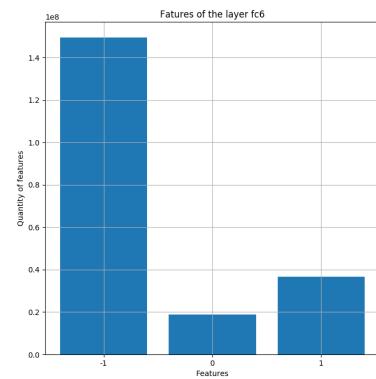
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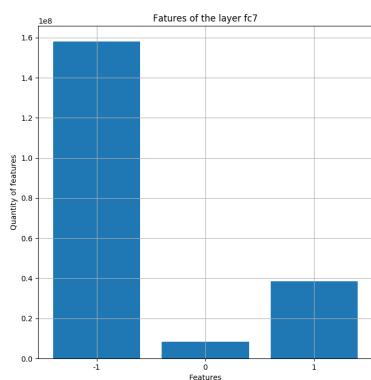
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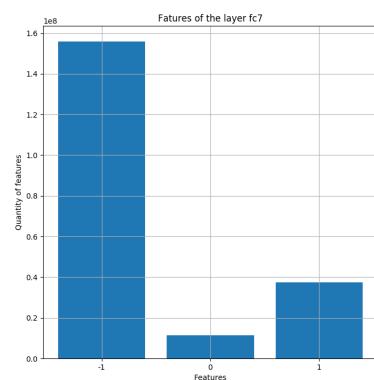
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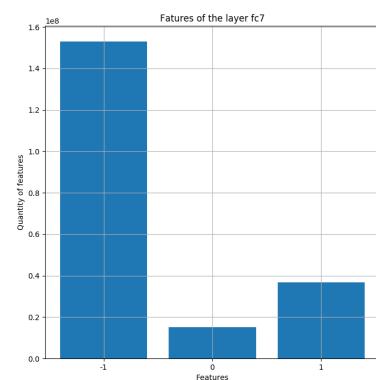
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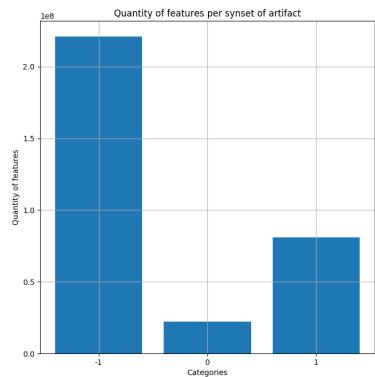


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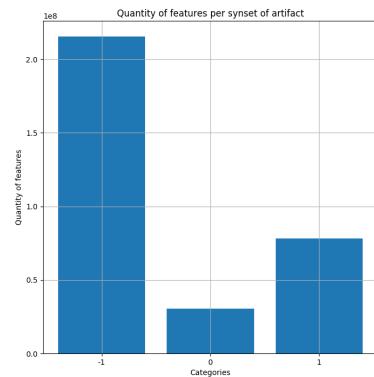


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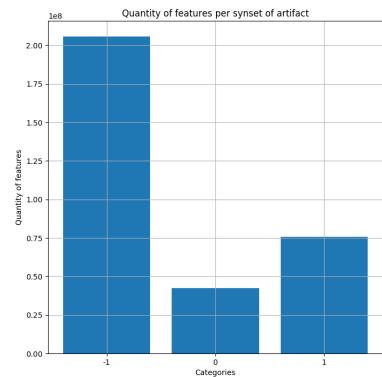
2.4 Distribución de las features por synset



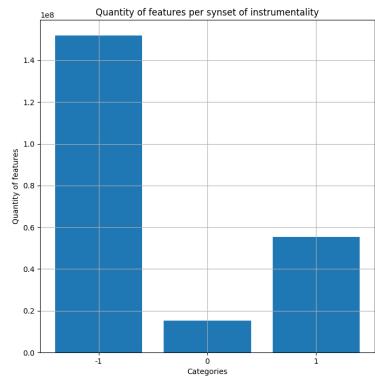
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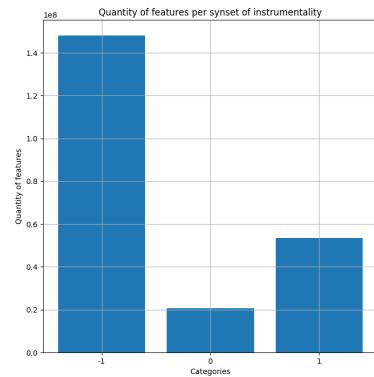
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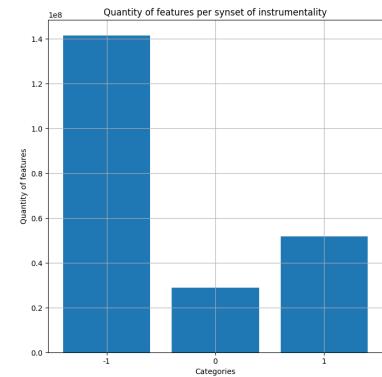
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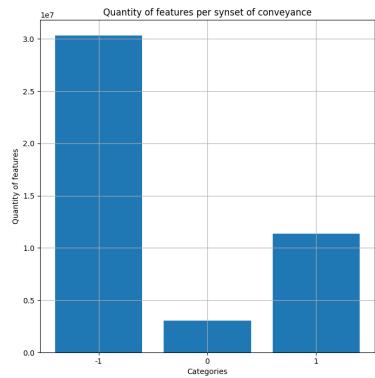
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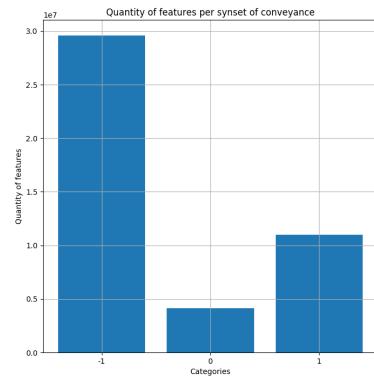
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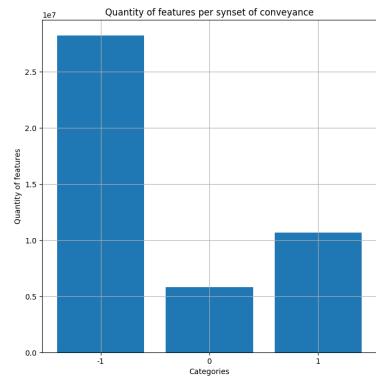
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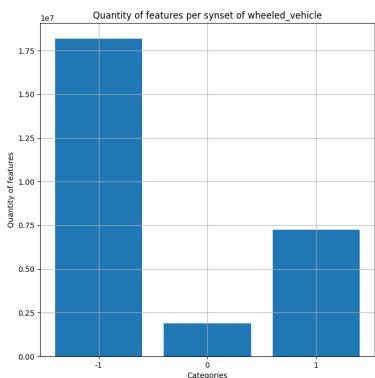
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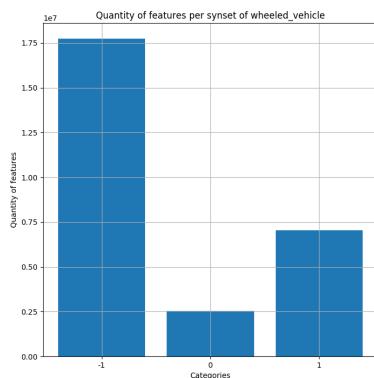
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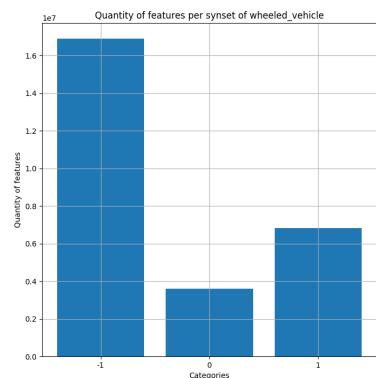
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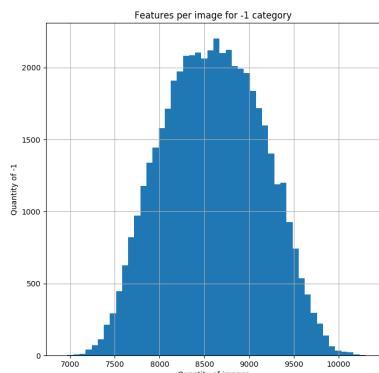
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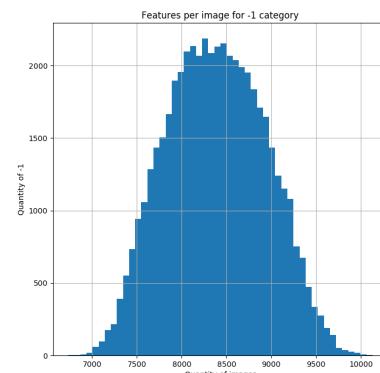
Embedding 31

2.5 Features per image

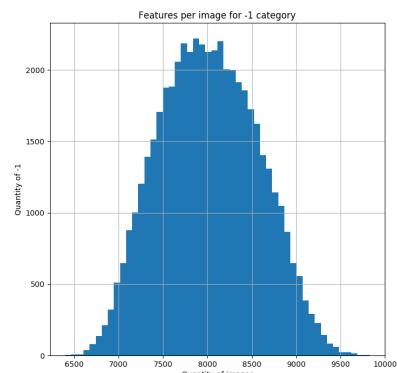
There are for each image the total counting of features active, for the different possible categories ($-1, 0, 1$):



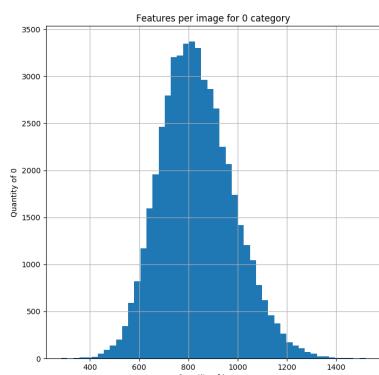
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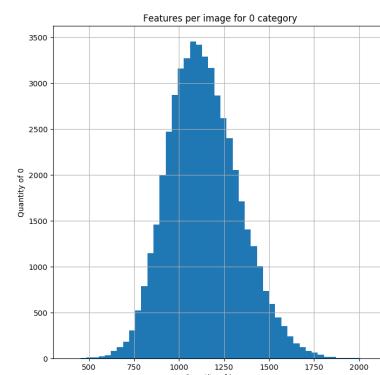
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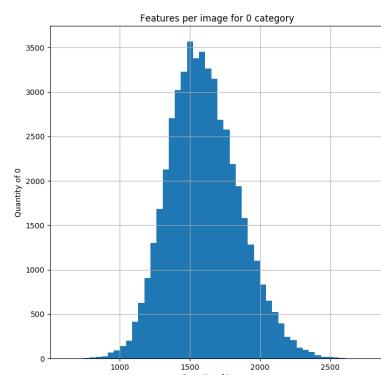
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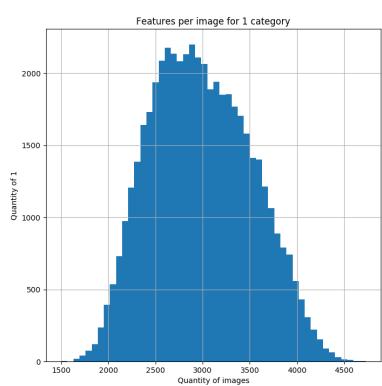
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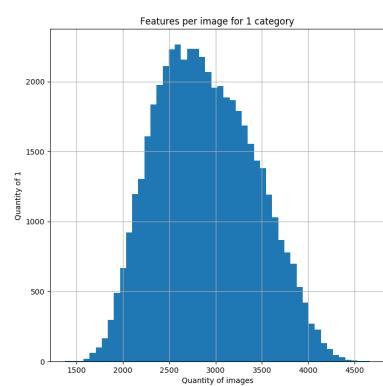
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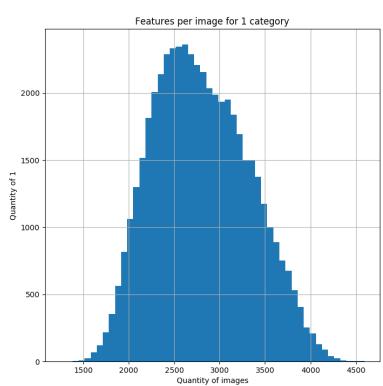
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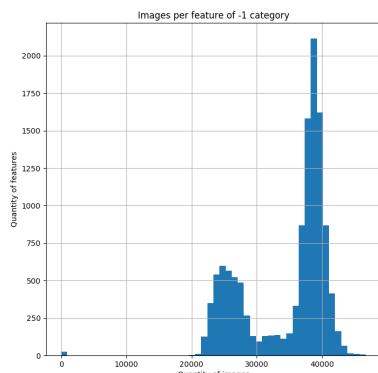
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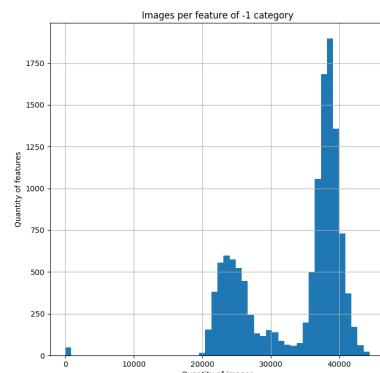
Embedding 31

2.6 Images per feature

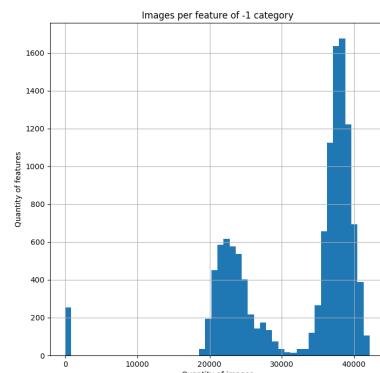
Now I calculate for each feature how many images activate in each specific category:



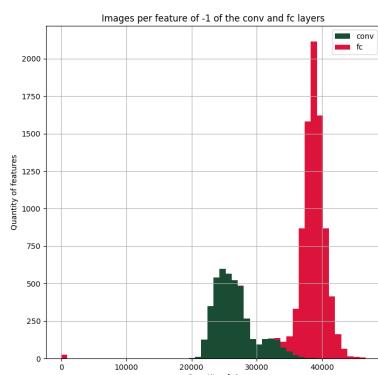
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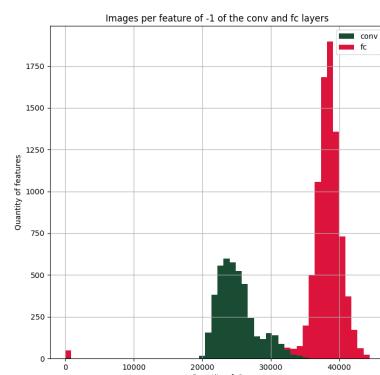
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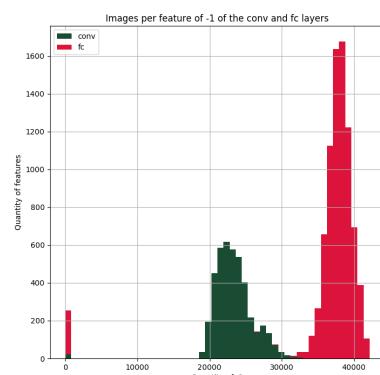
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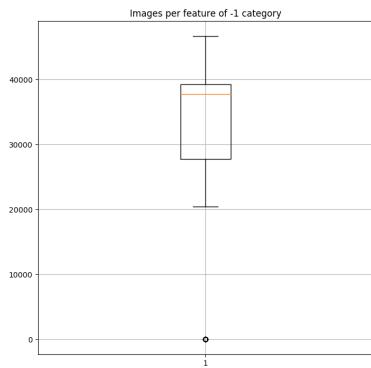
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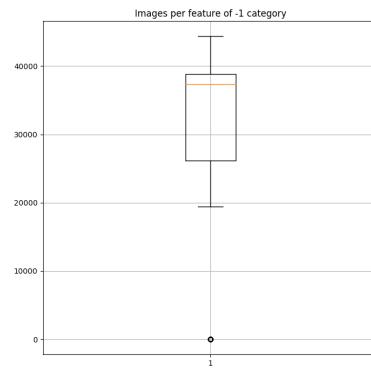
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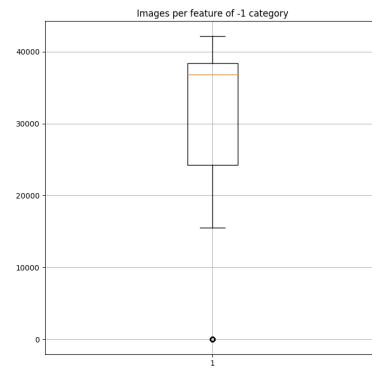
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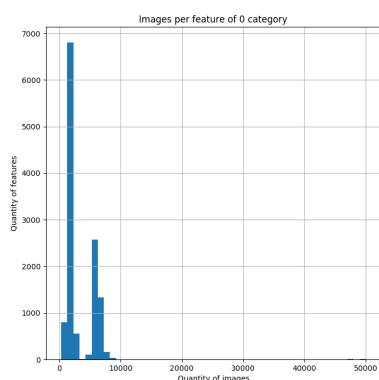
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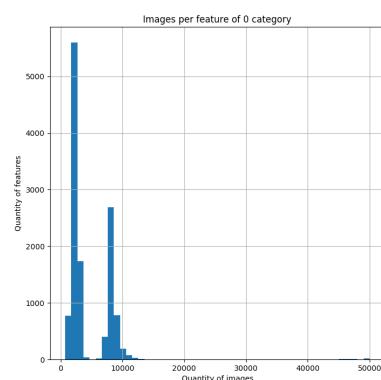
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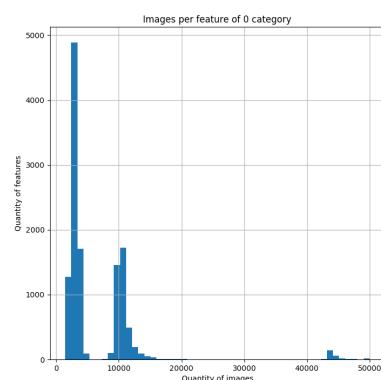
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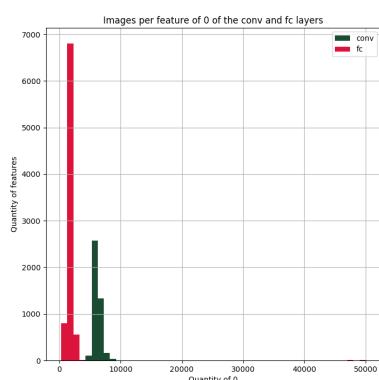
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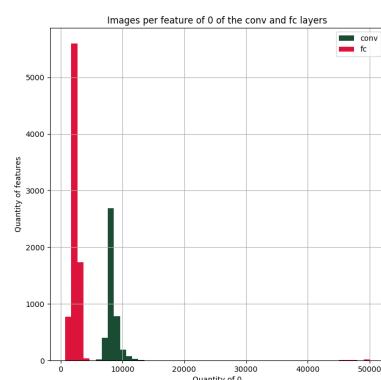
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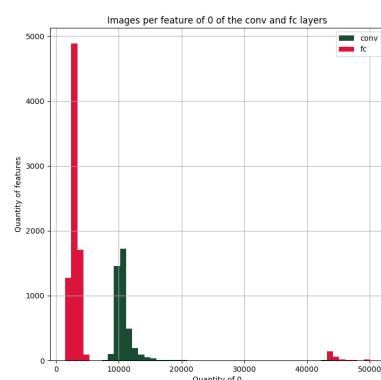
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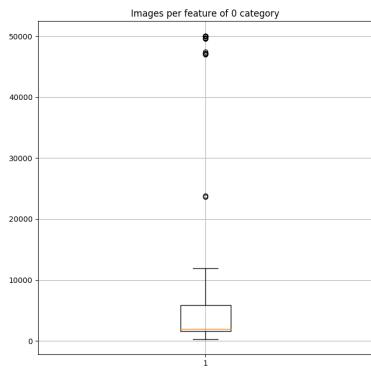
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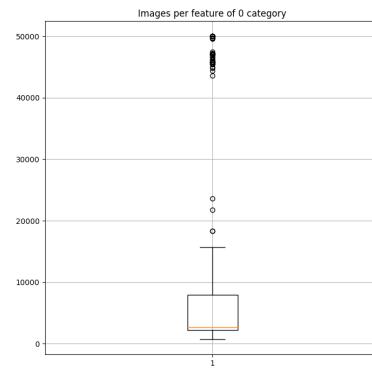
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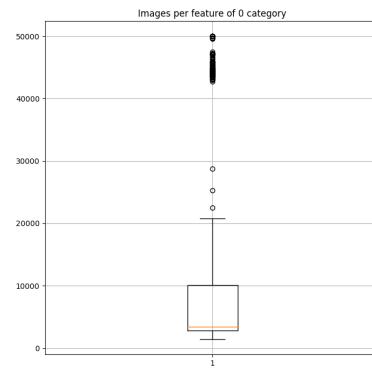
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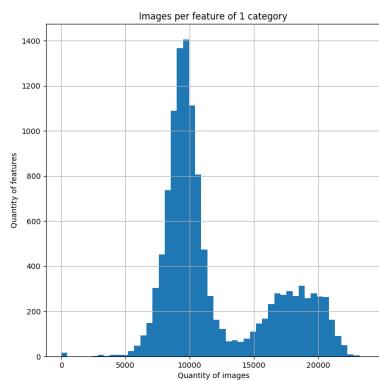
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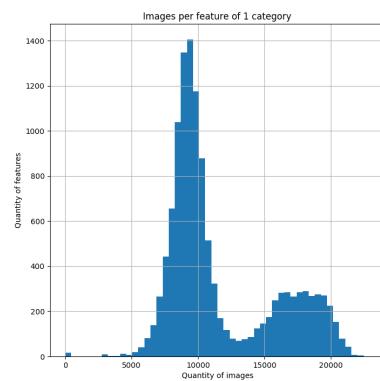
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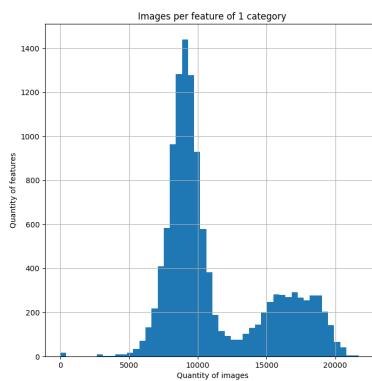
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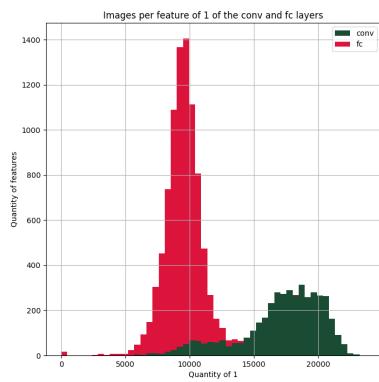
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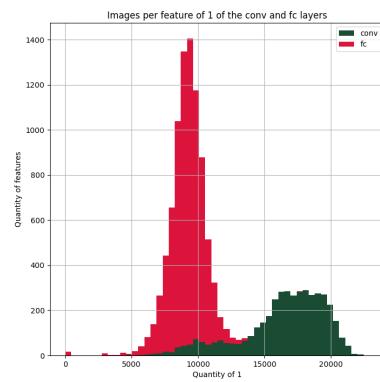
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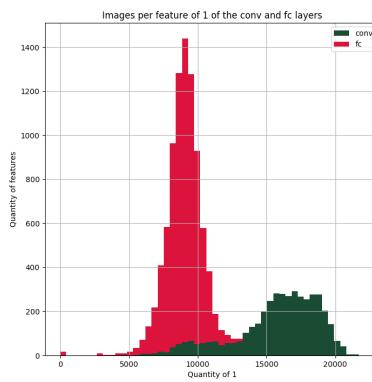
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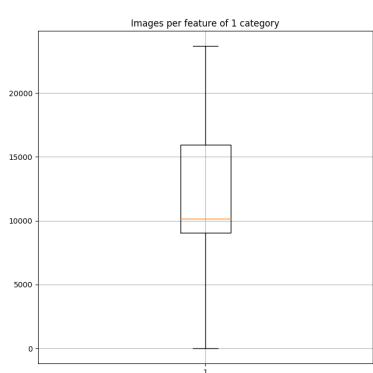
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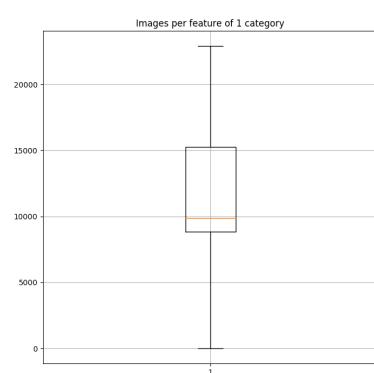
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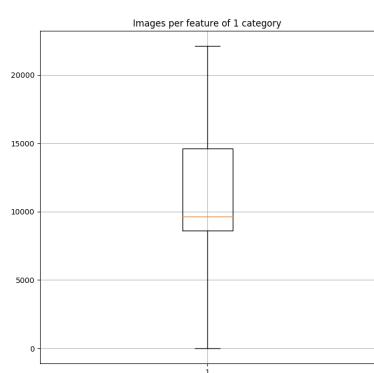
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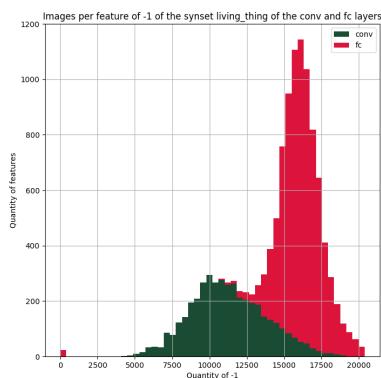


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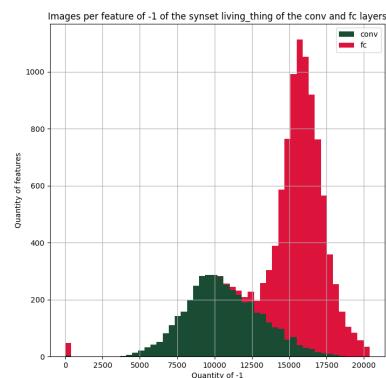


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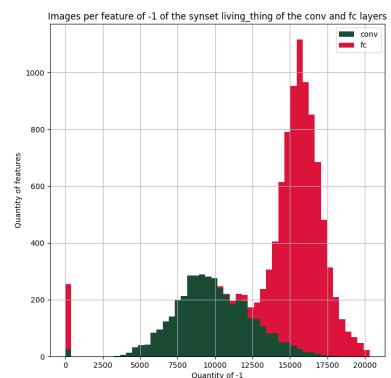
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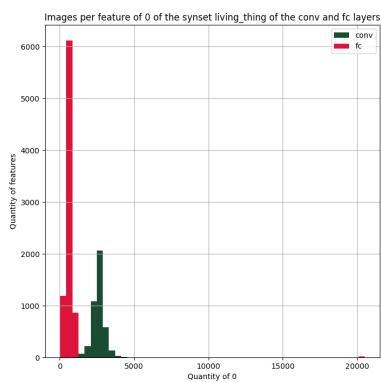
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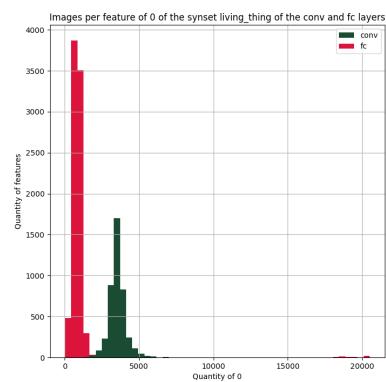
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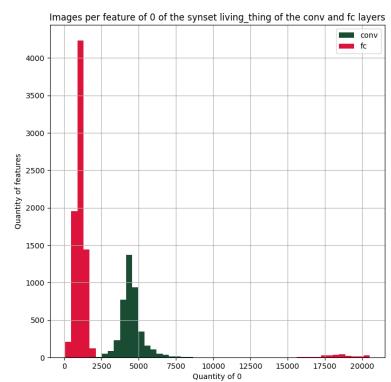
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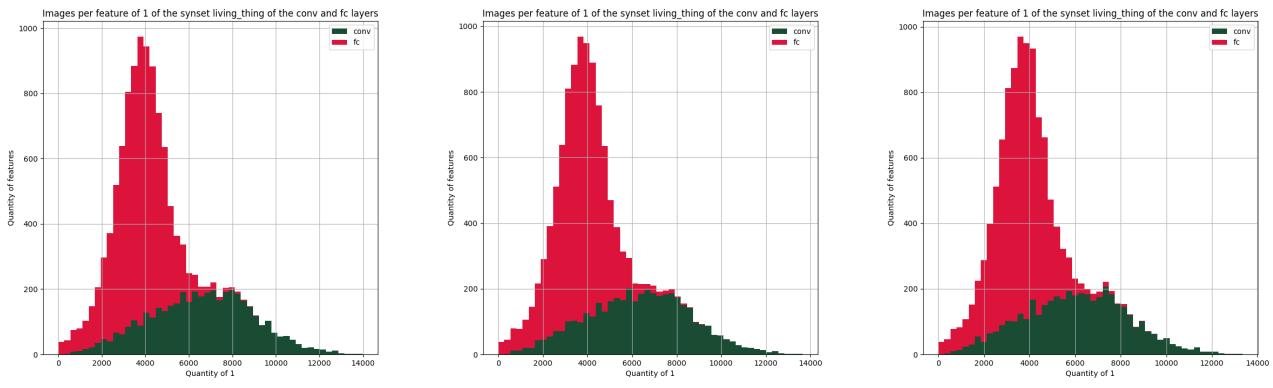
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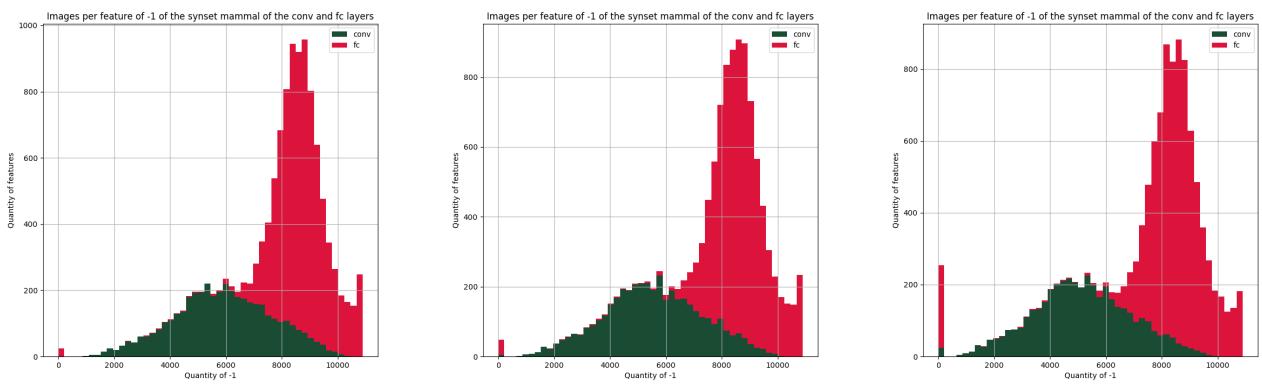
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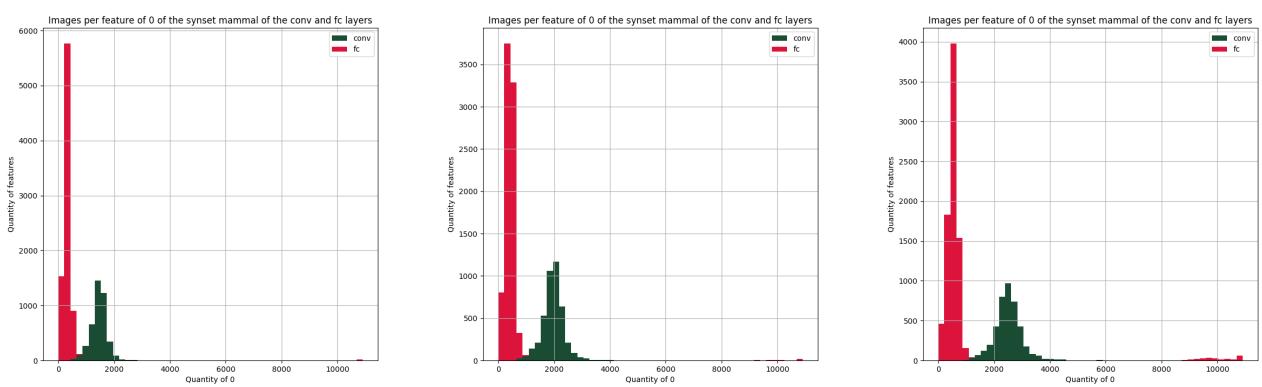
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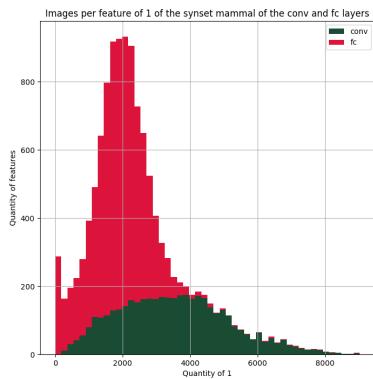
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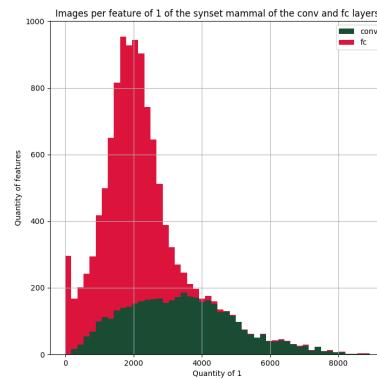
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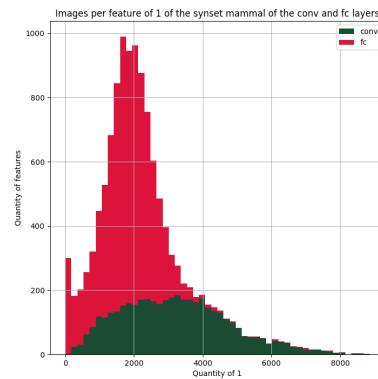
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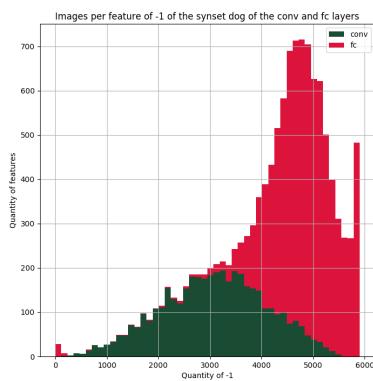
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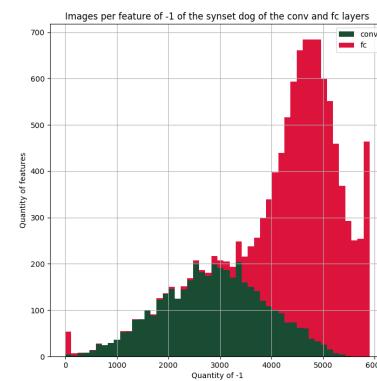
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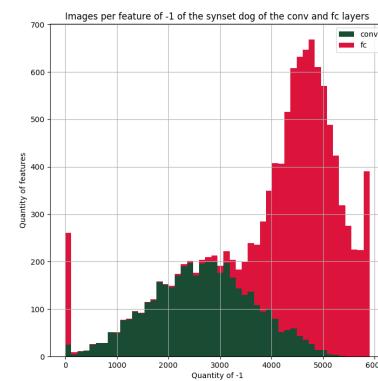
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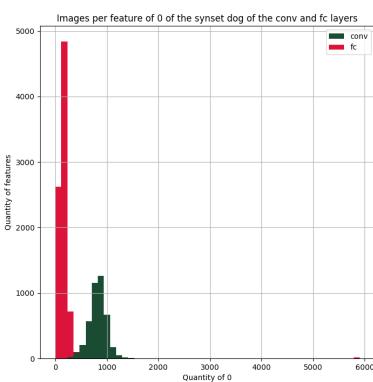
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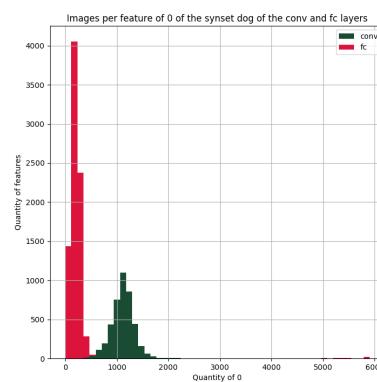
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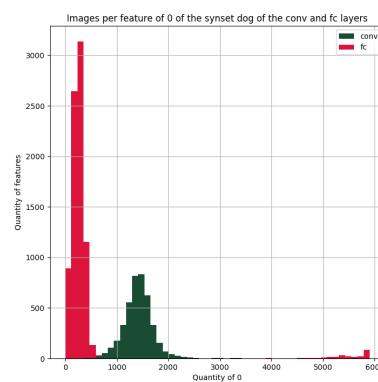
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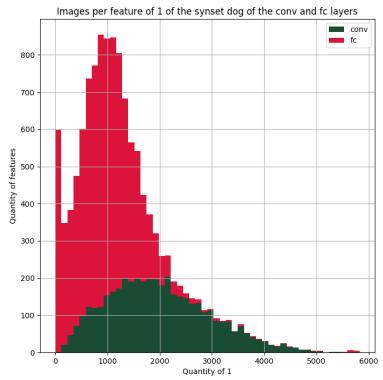
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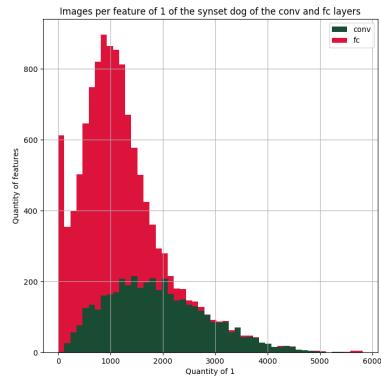
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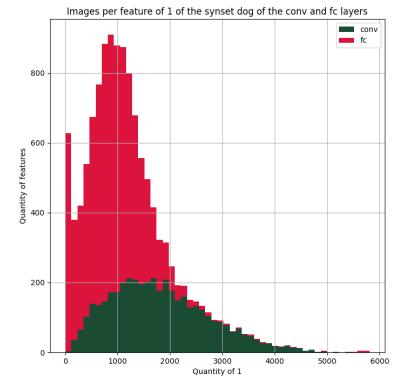
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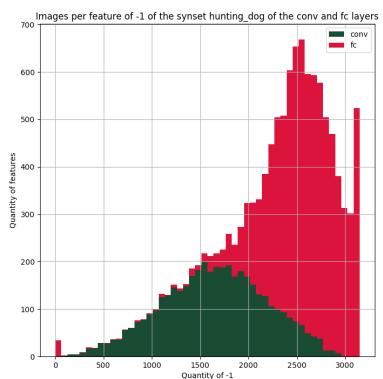
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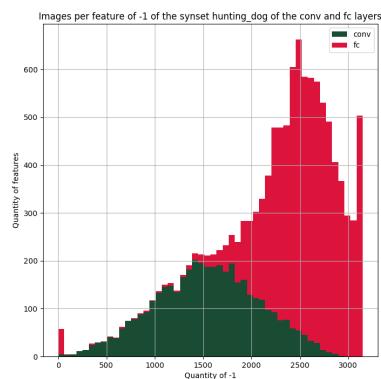
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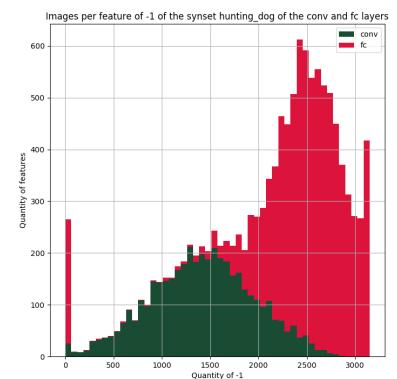
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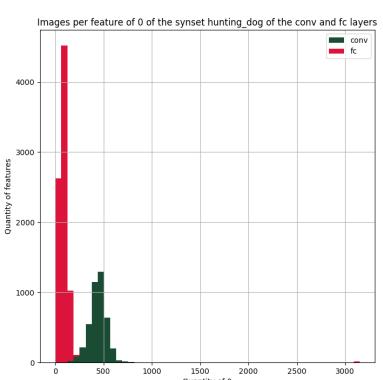
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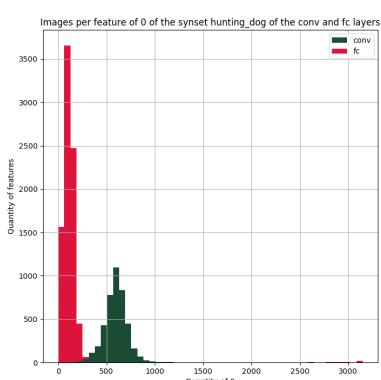
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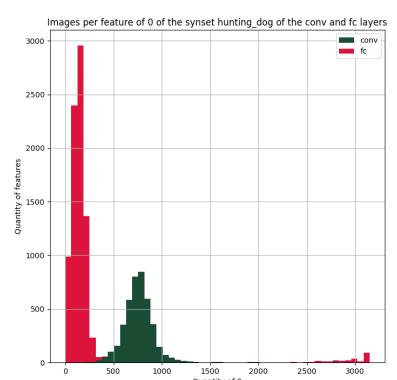
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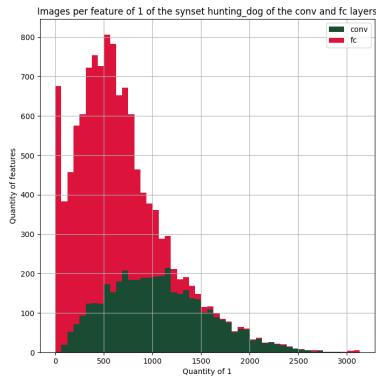
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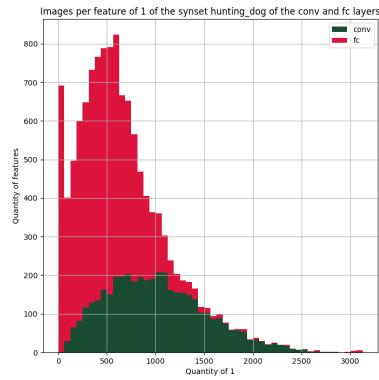
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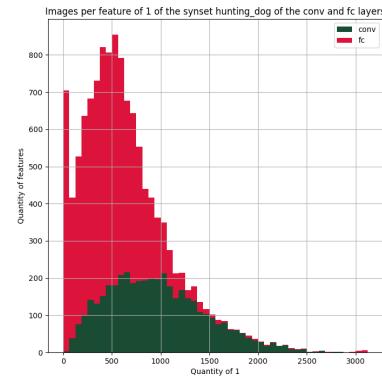
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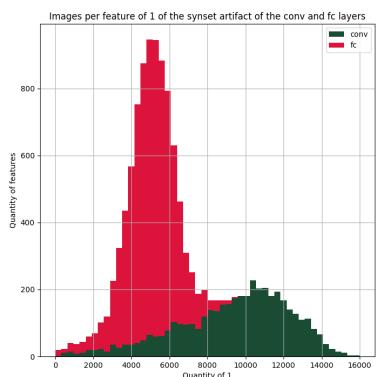
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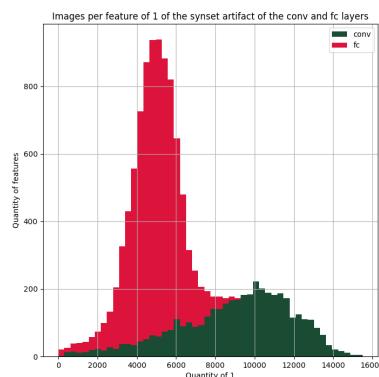
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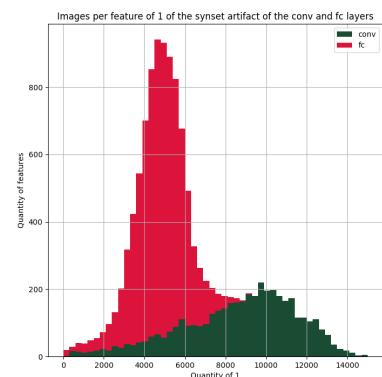
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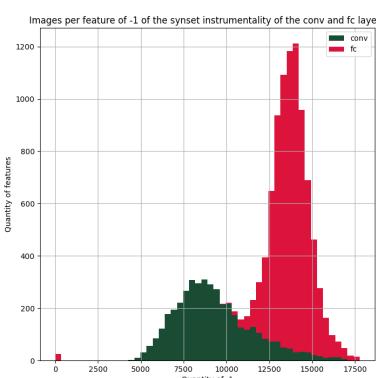
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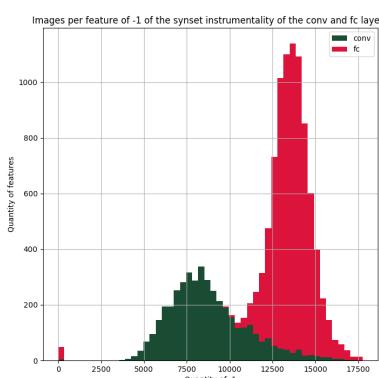
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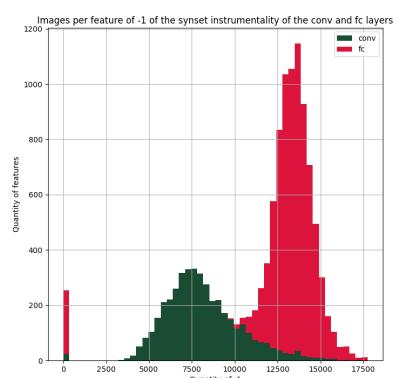
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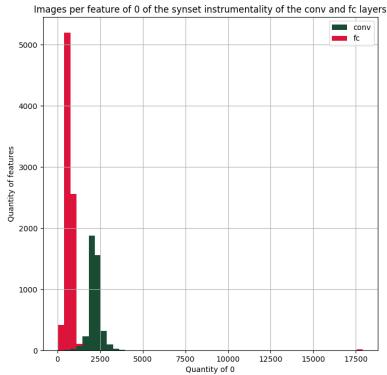
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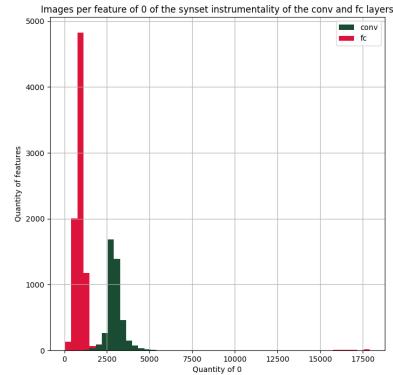
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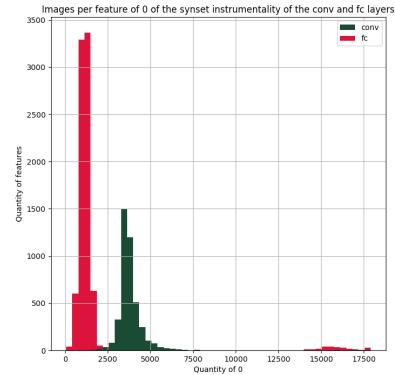
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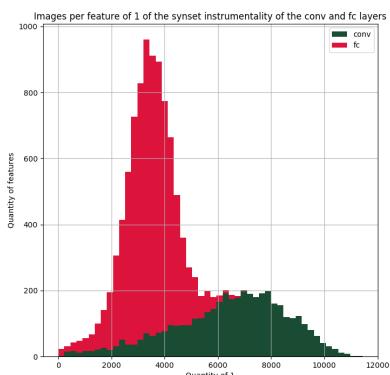
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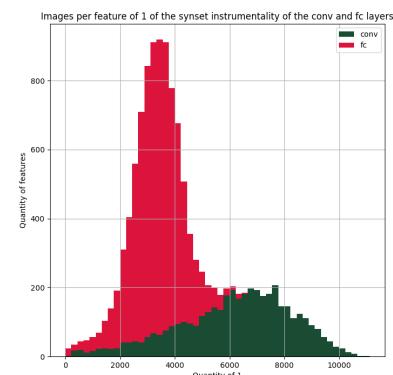
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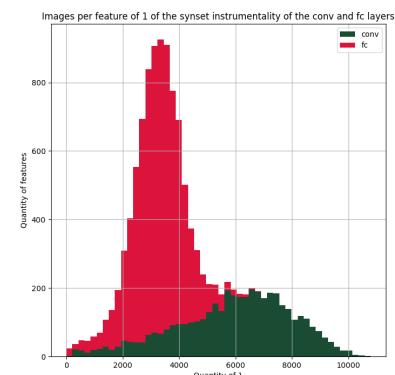
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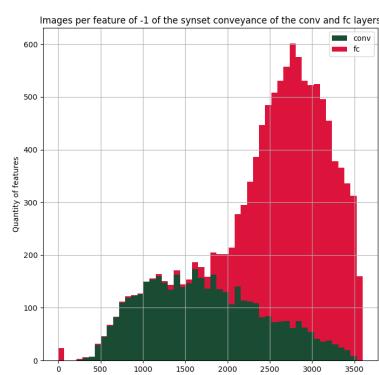
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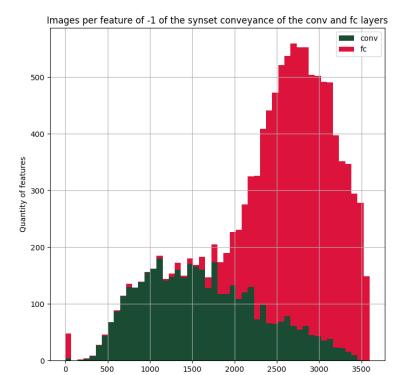
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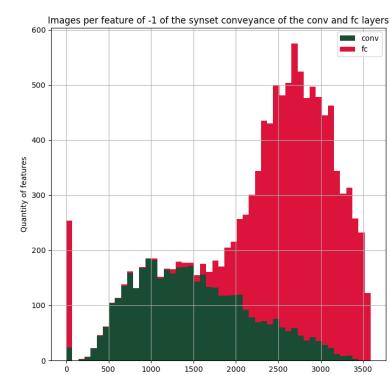
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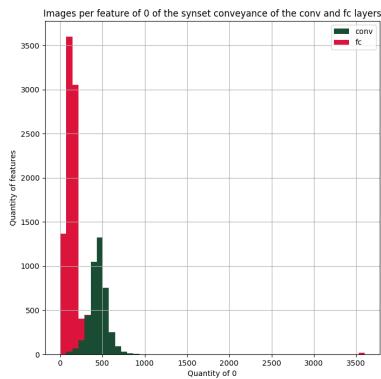
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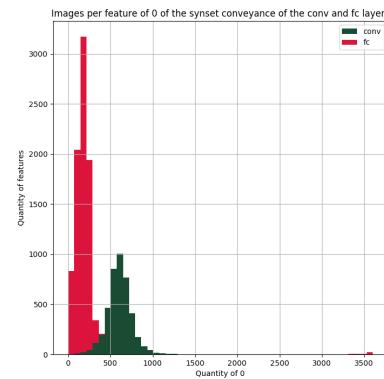
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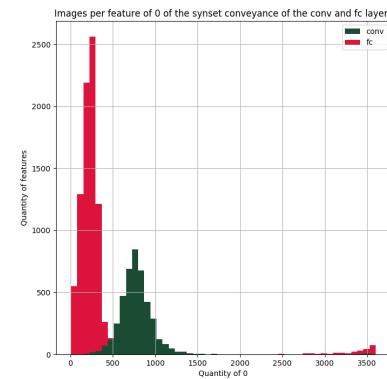
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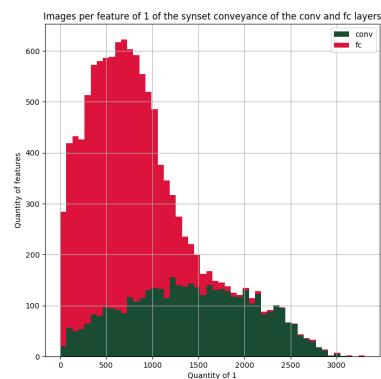
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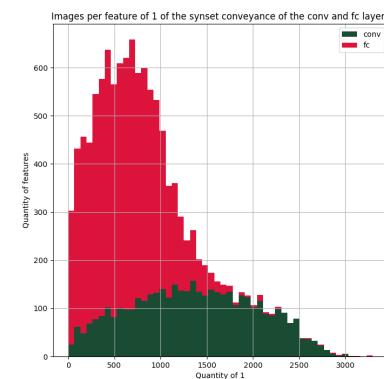
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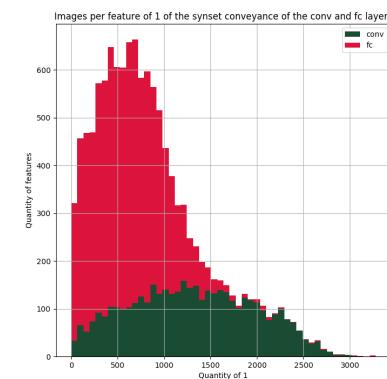
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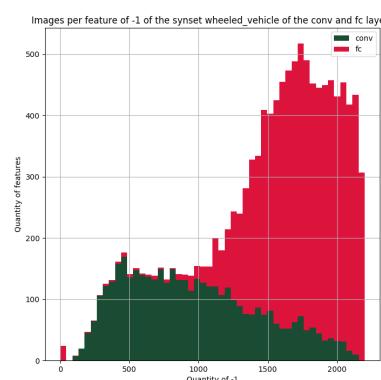
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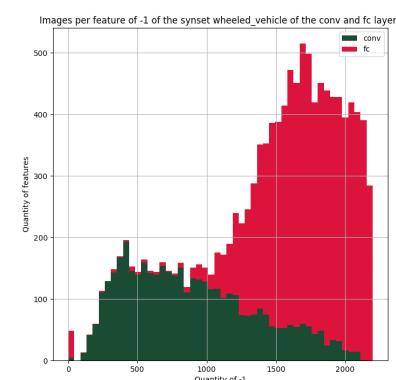
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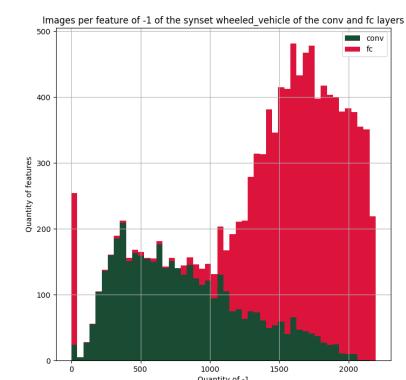
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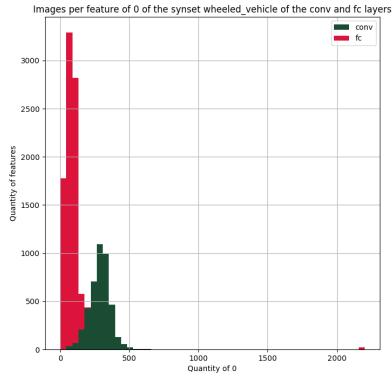
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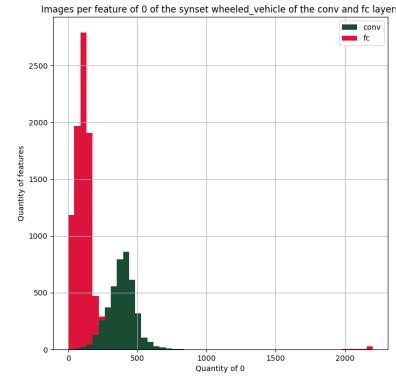
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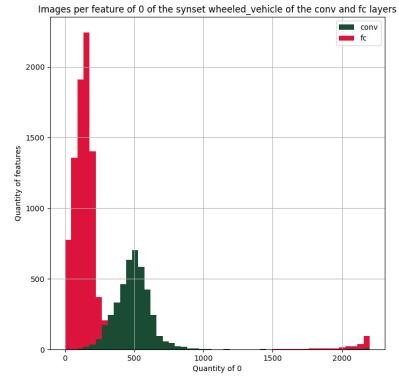
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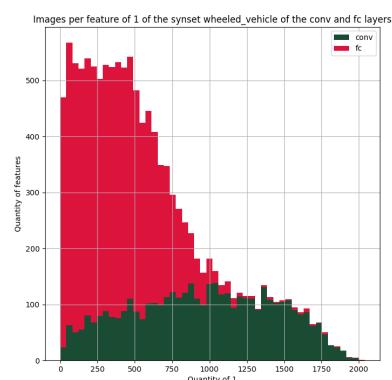
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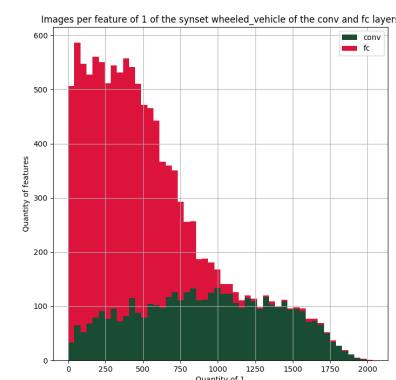
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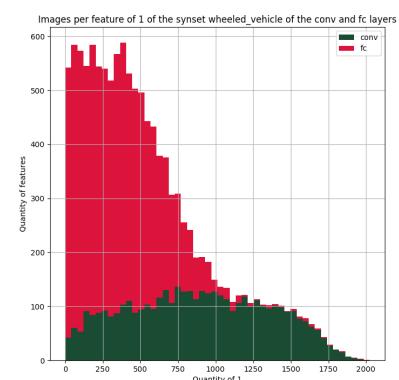
Embedding 31



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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

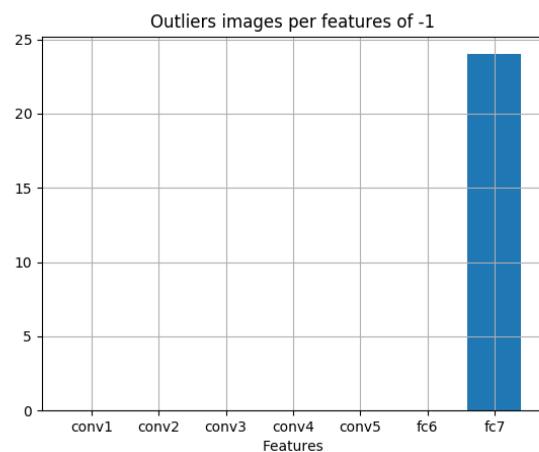


Figure 48: Category: -1

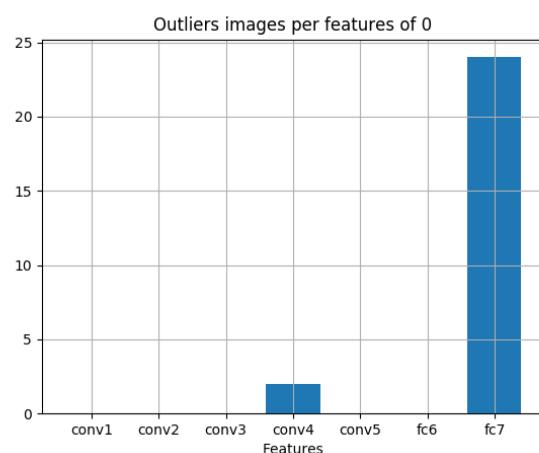


Figure 49: Category: 0

2.10 Matrices de cambio

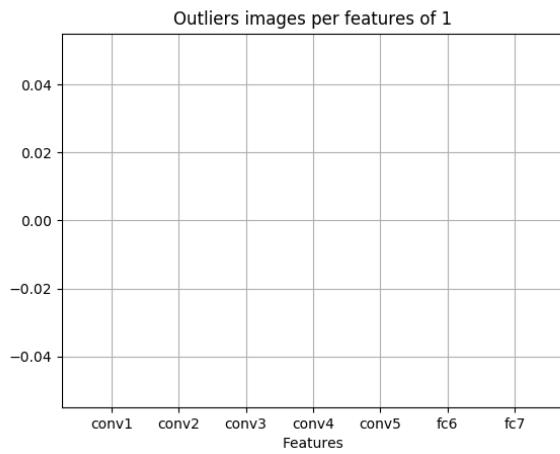
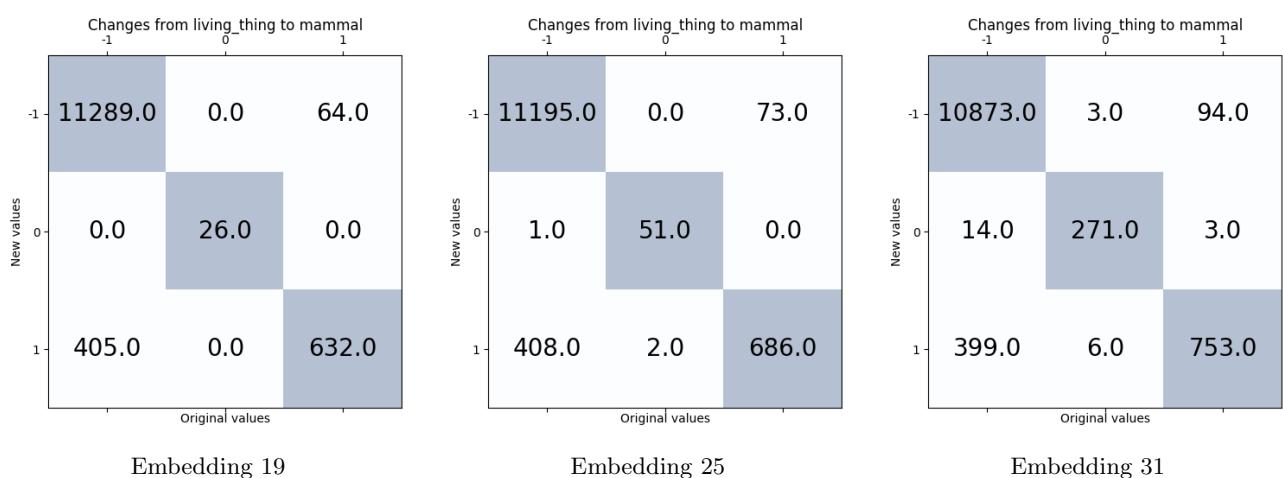
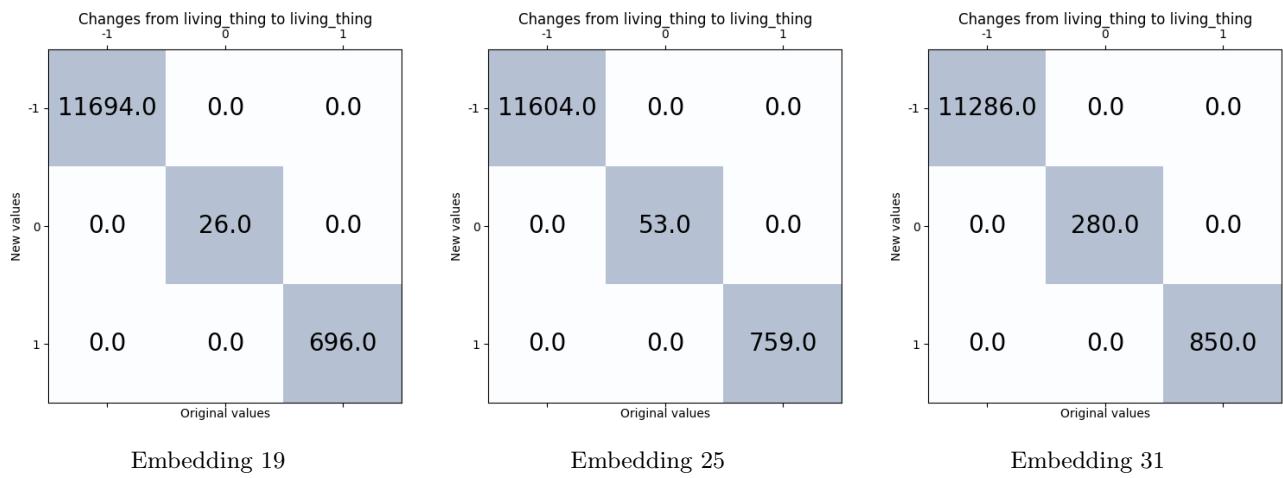
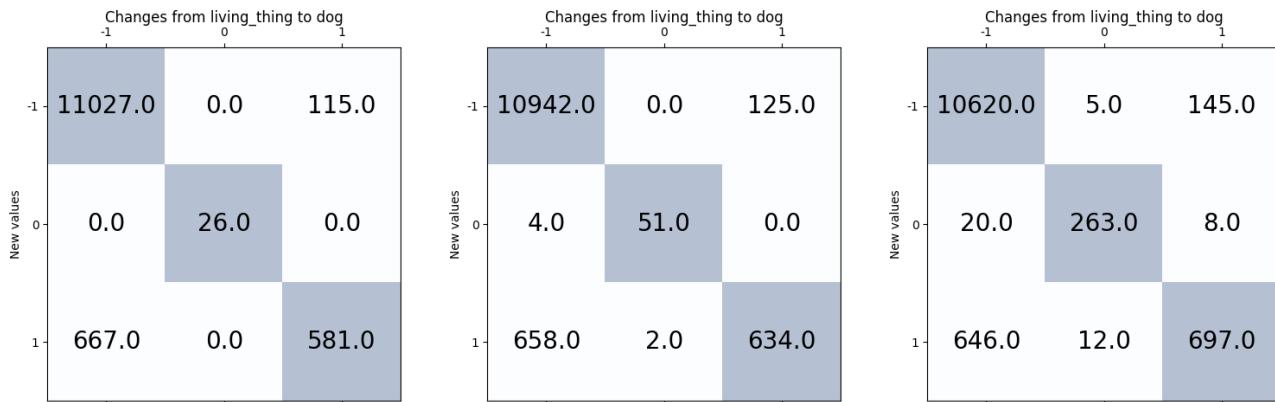


Figure 50: Category: 1

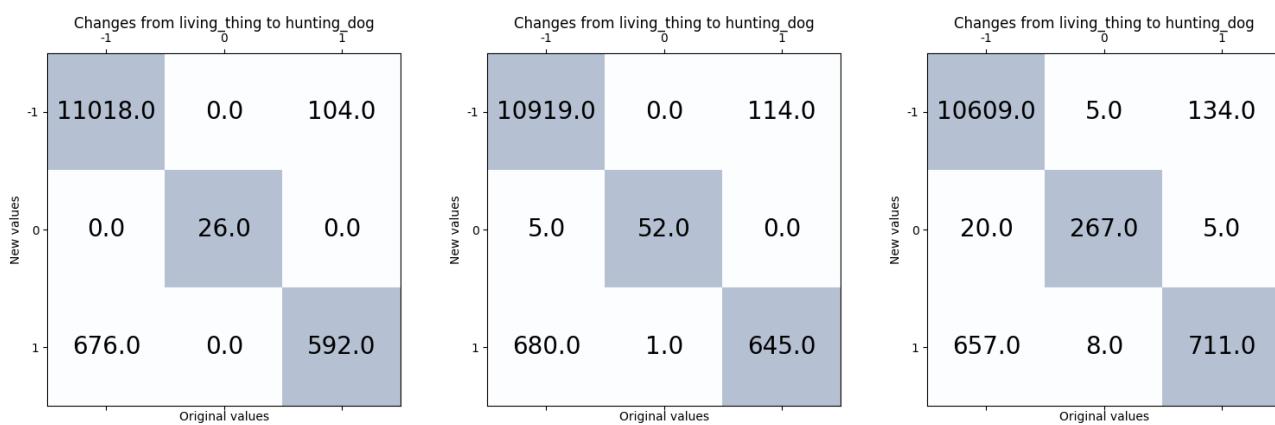




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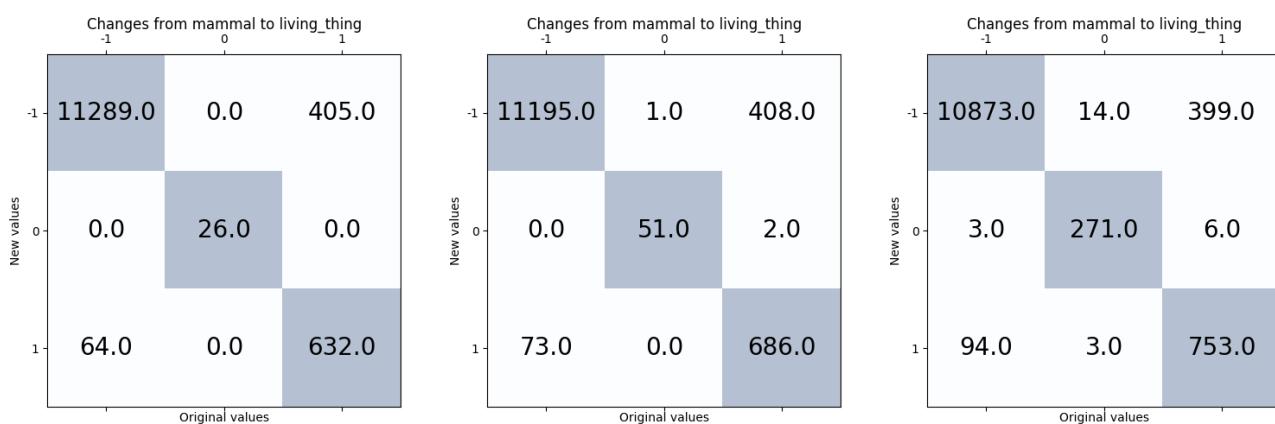
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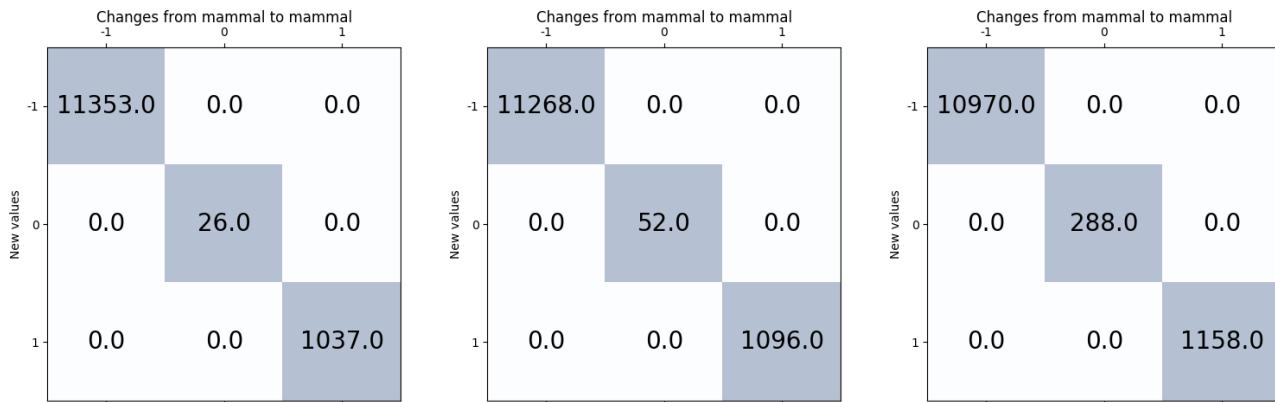
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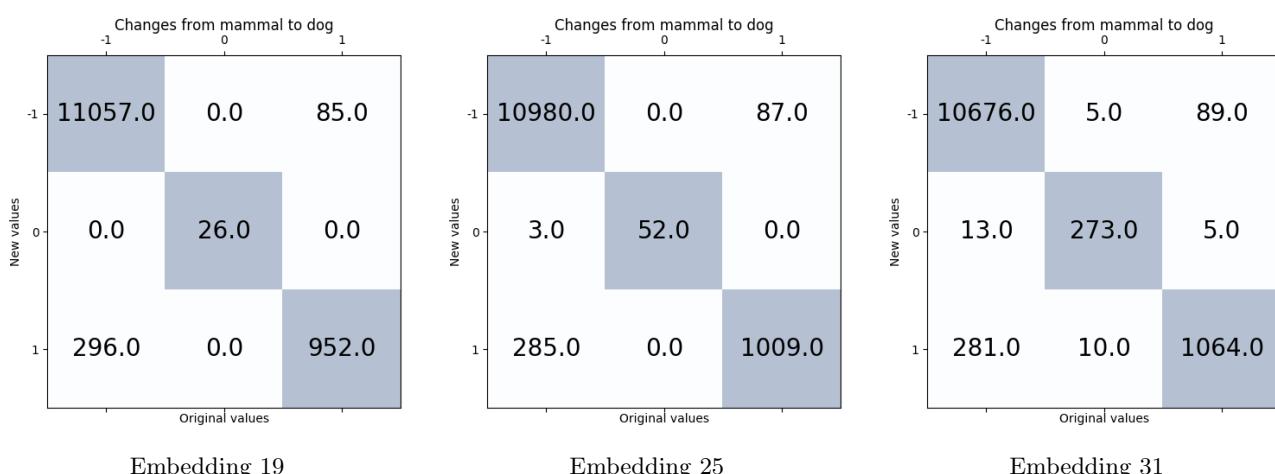
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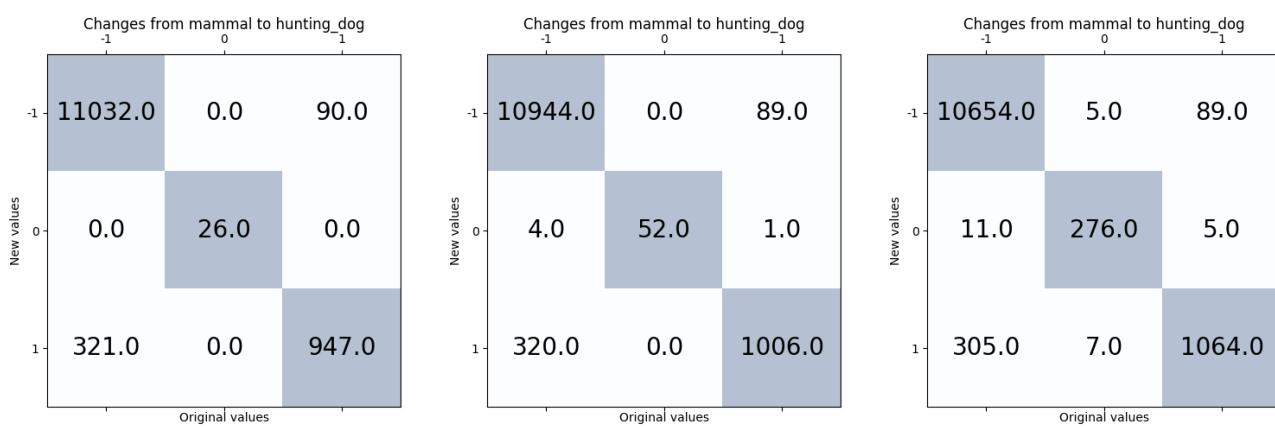
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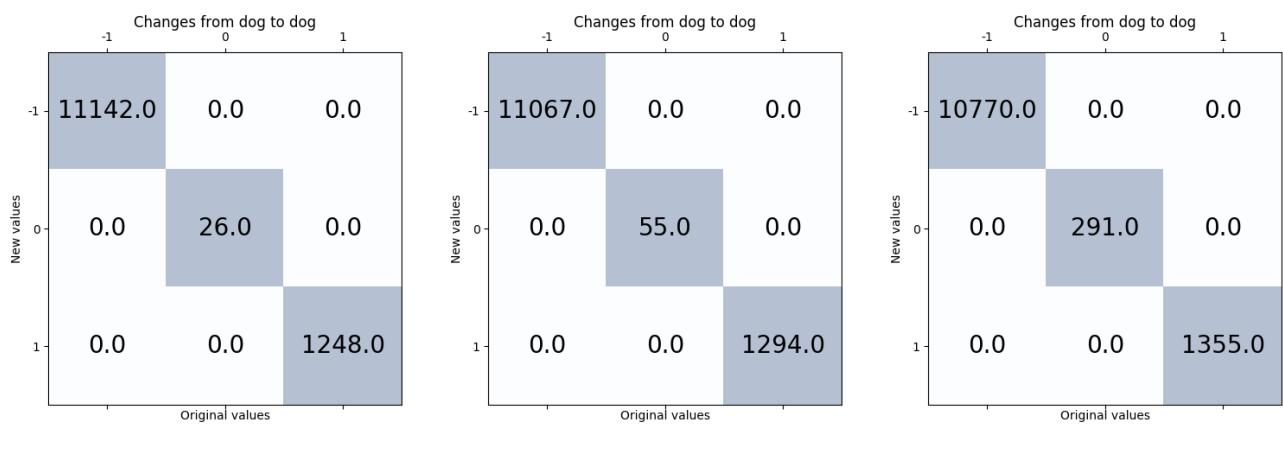
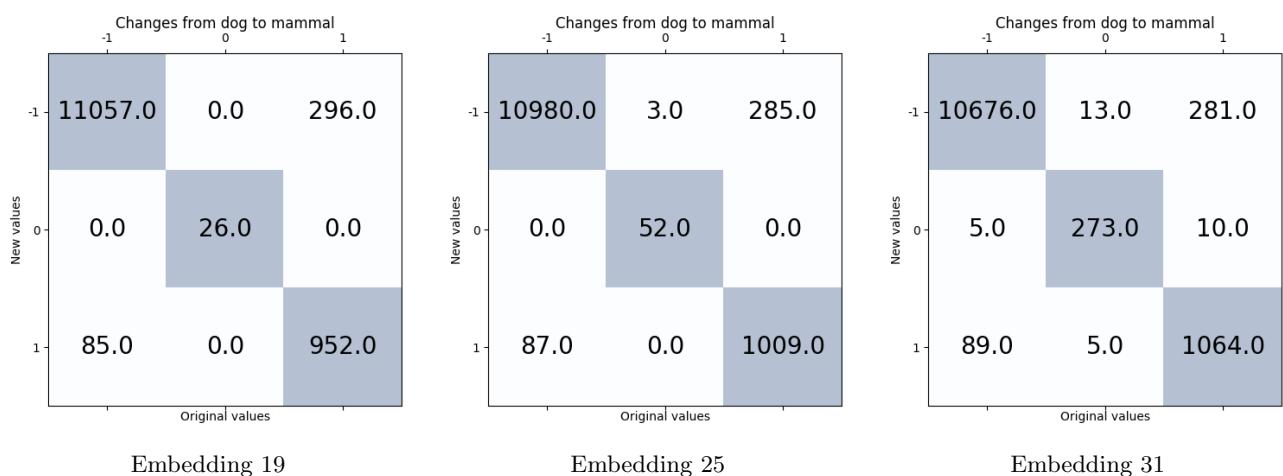
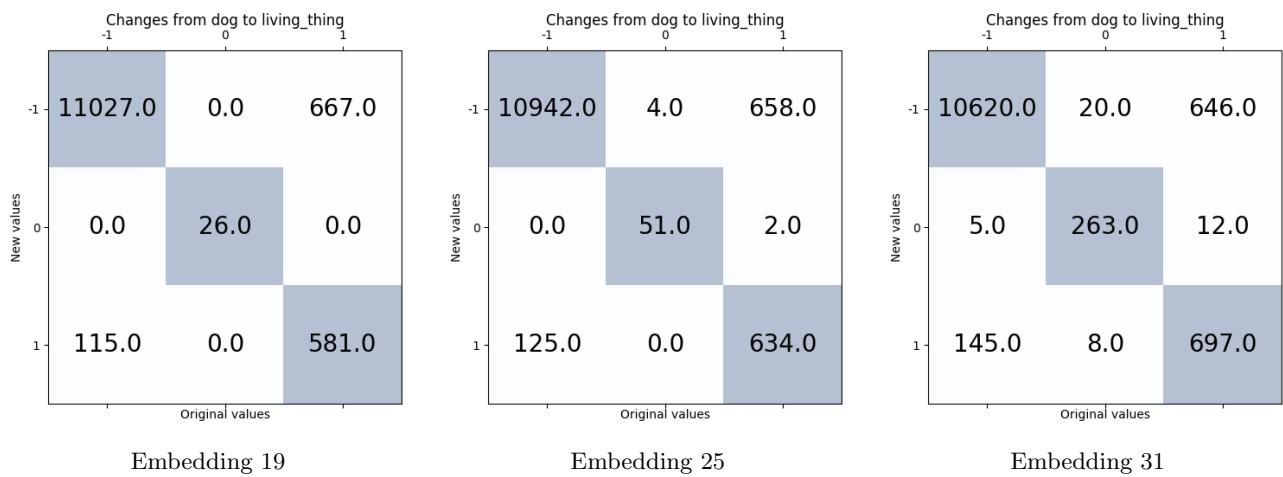
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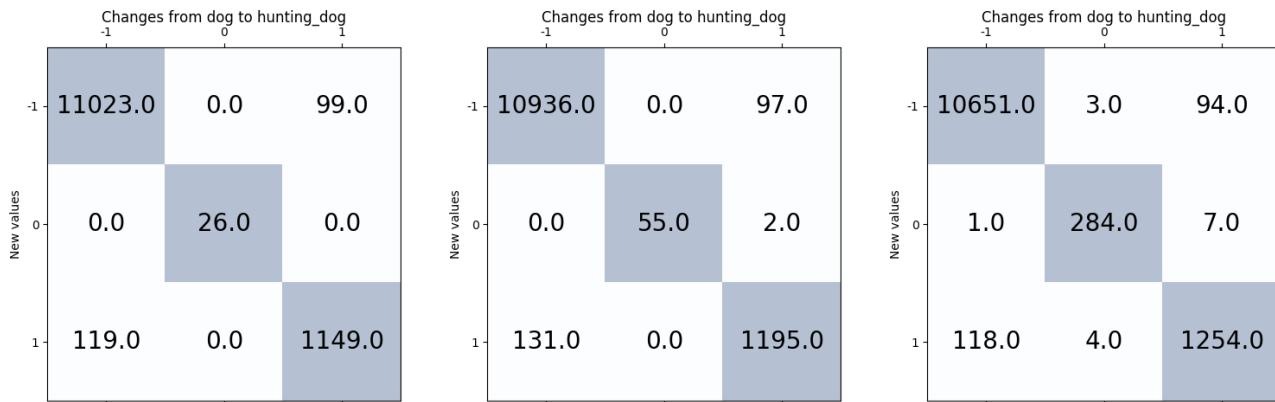


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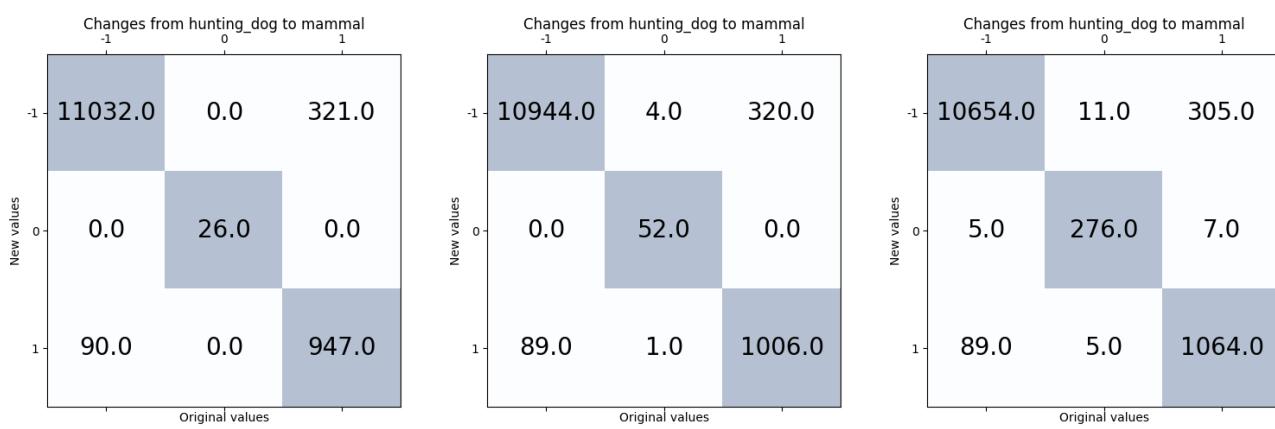
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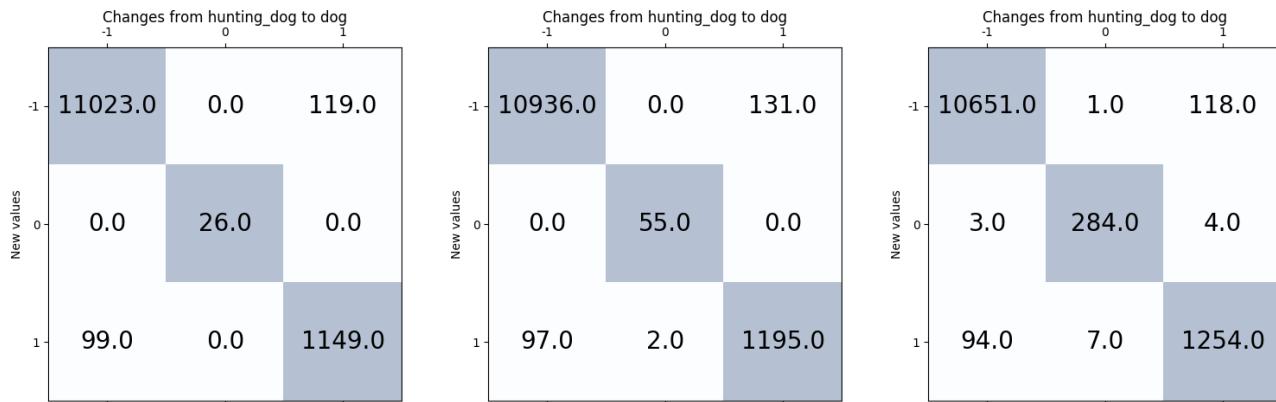
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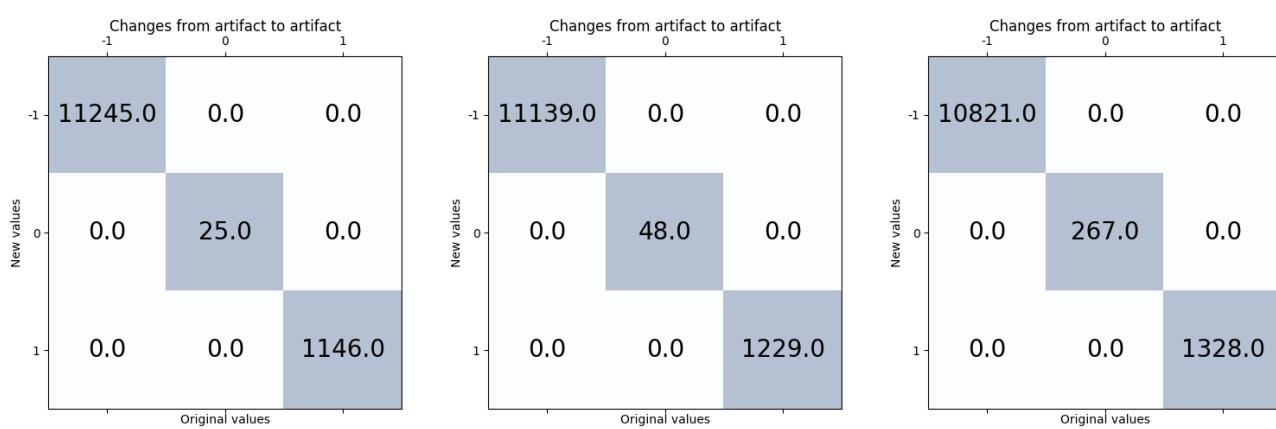
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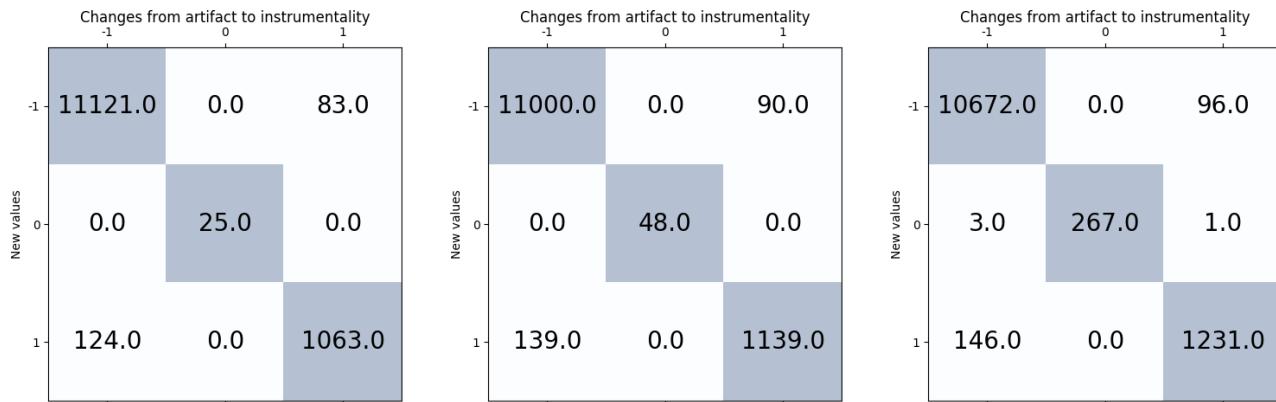
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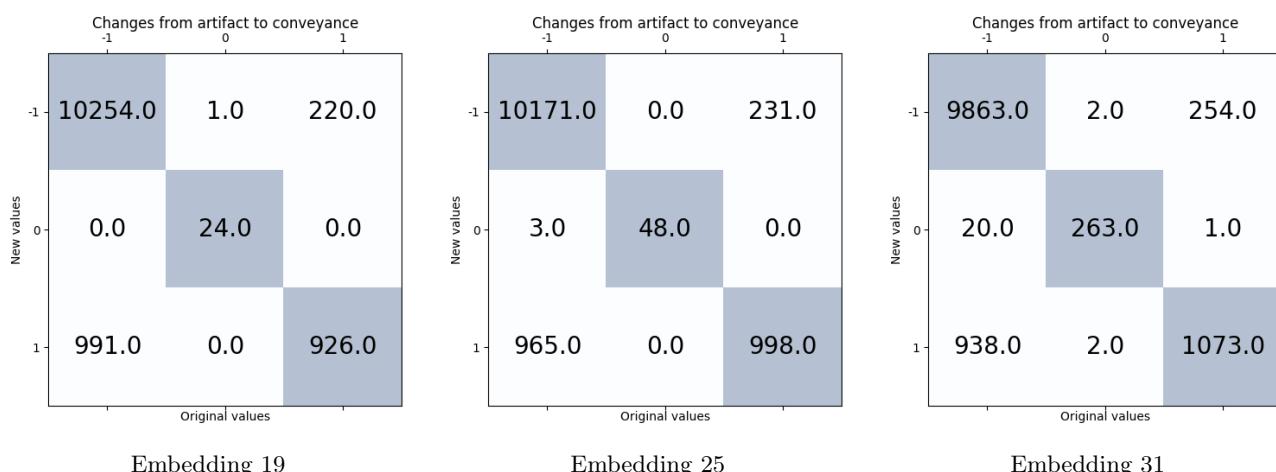
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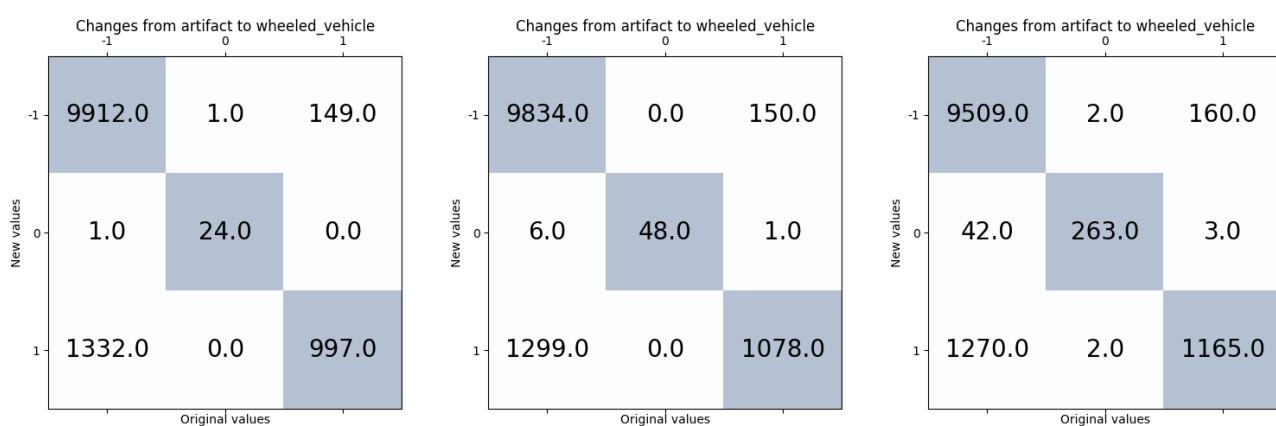
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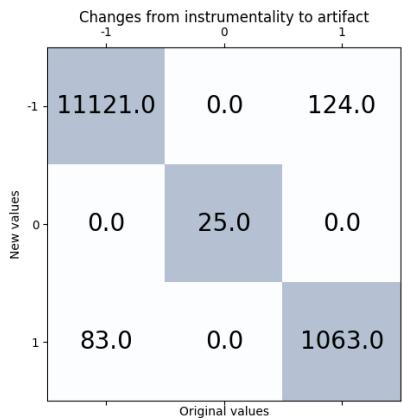
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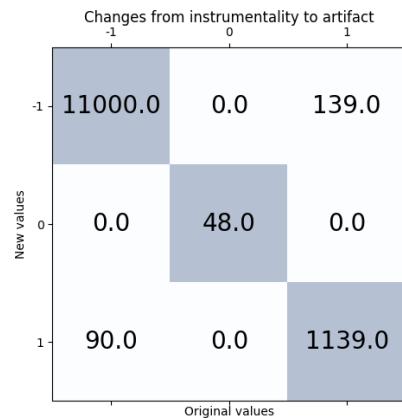
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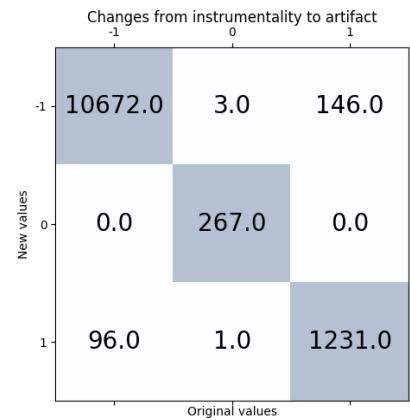
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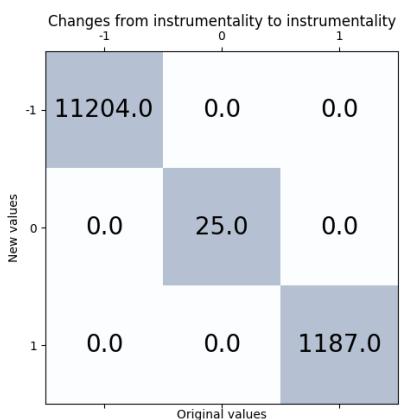
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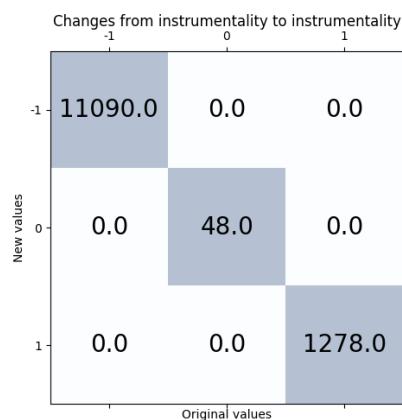
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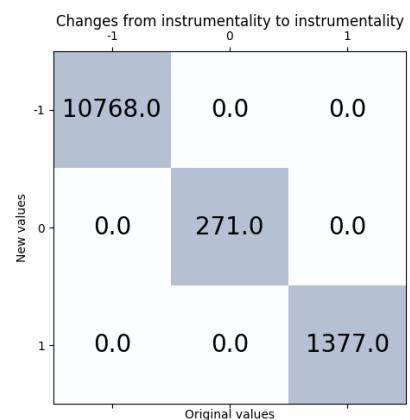
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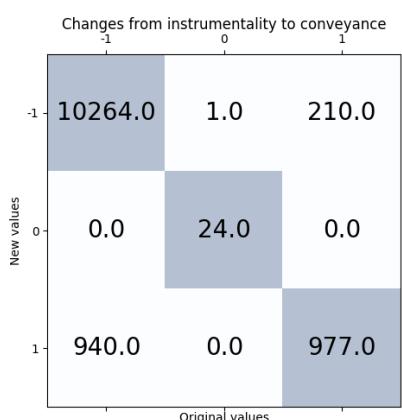
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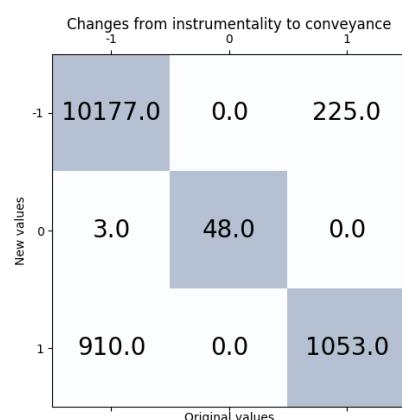
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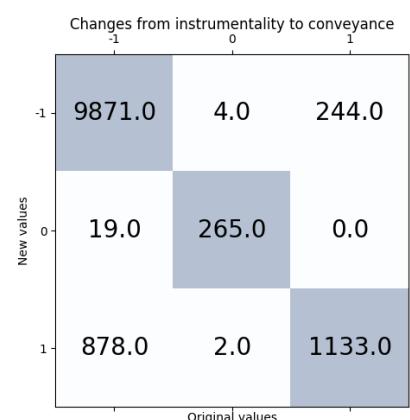
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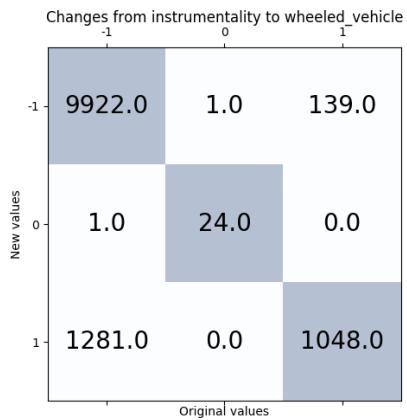
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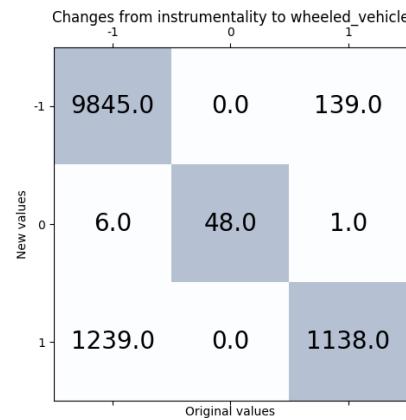
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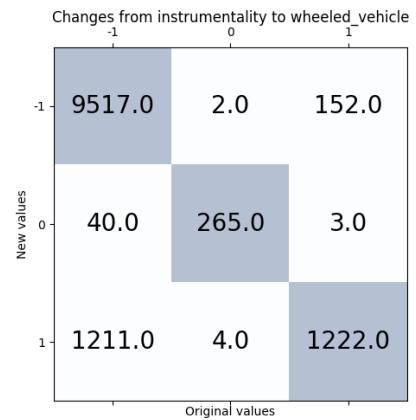
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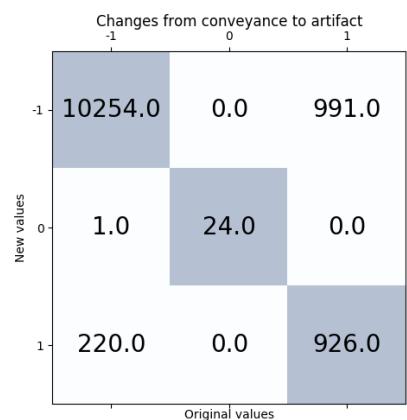
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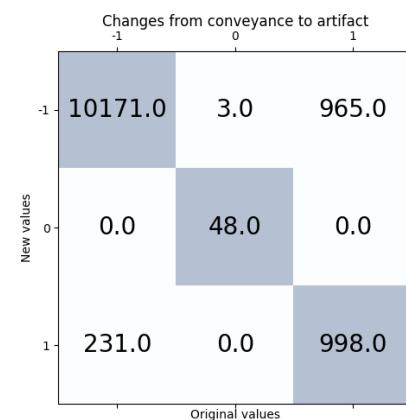
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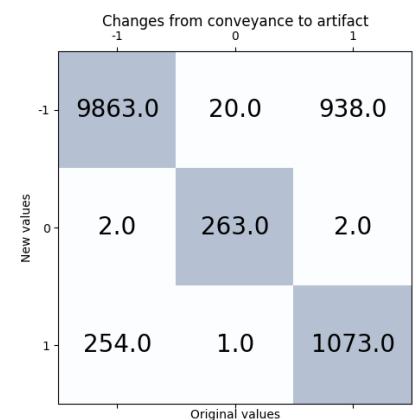
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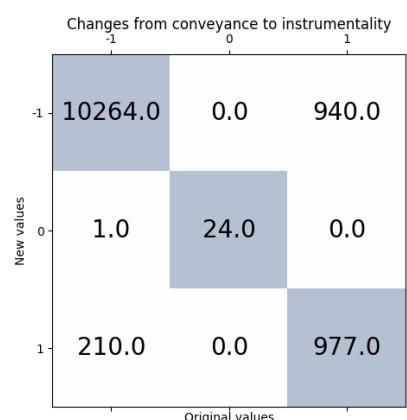
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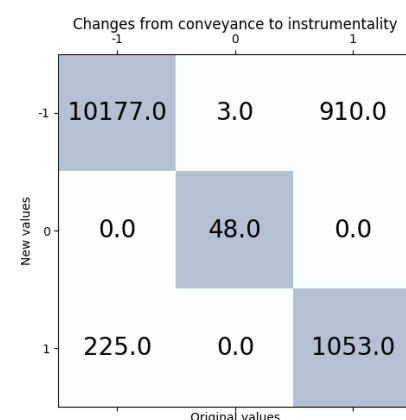
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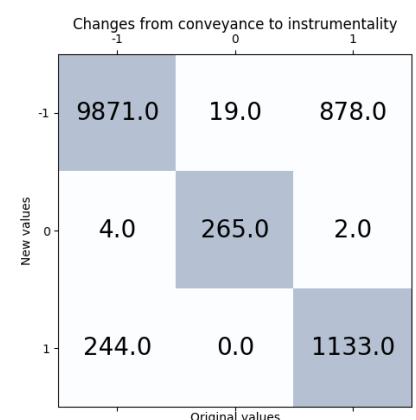
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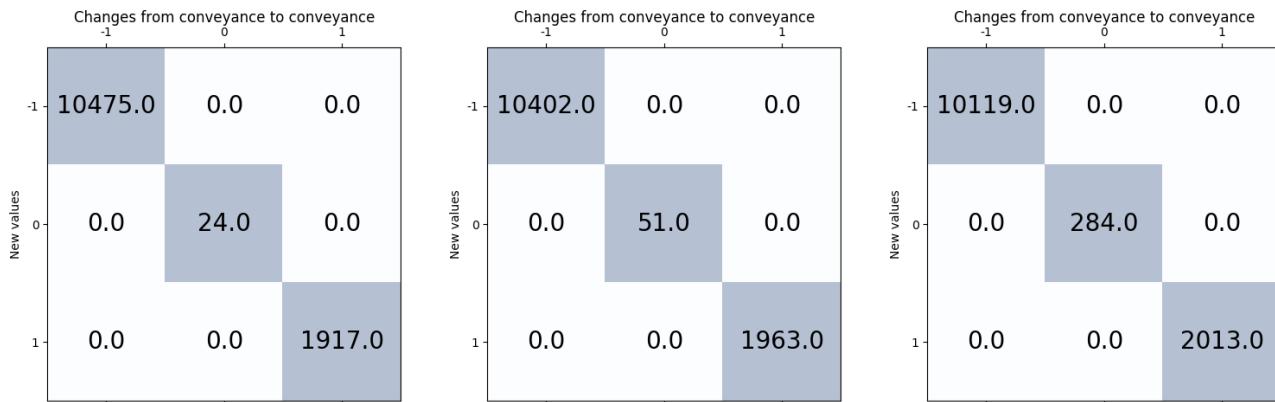
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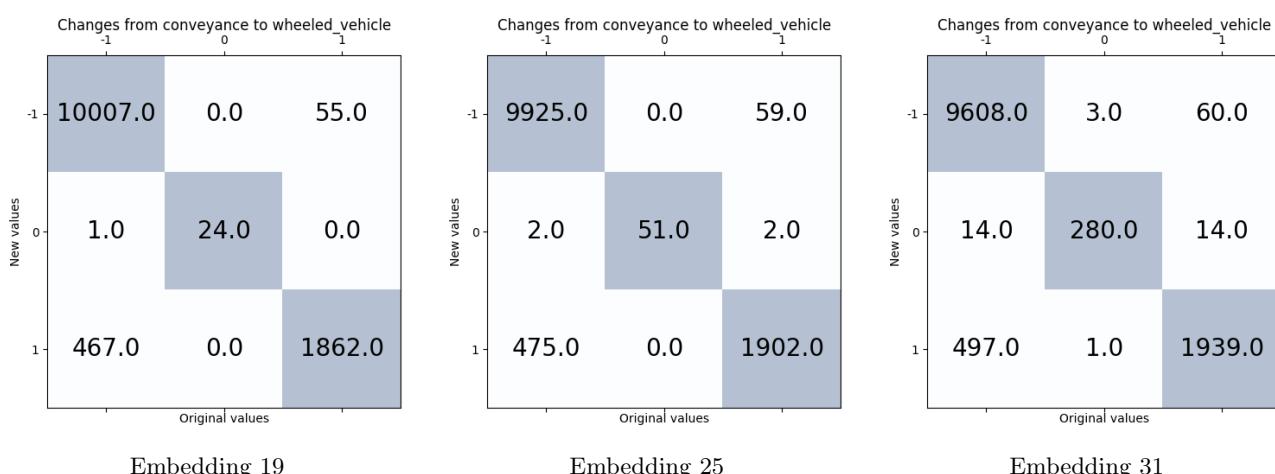
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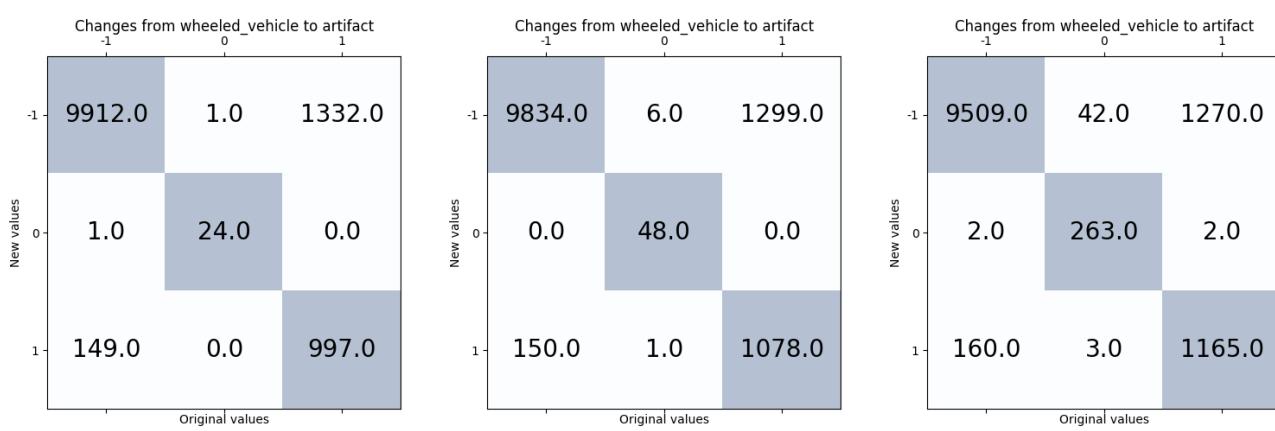
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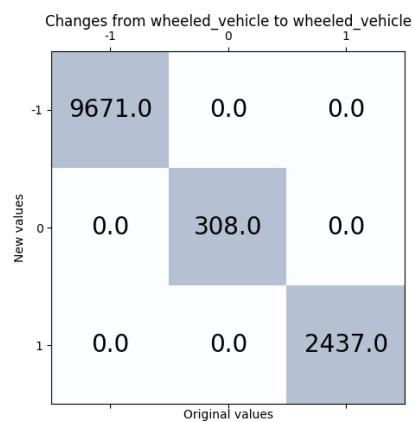
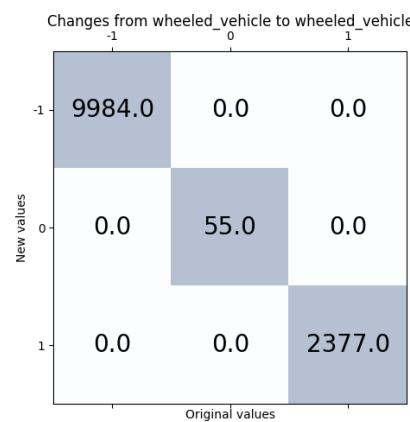
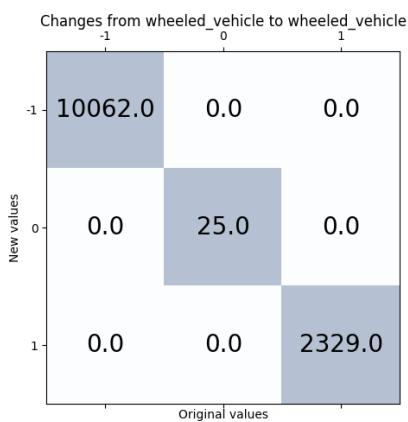
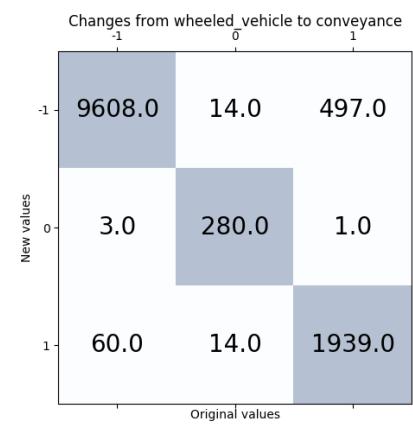
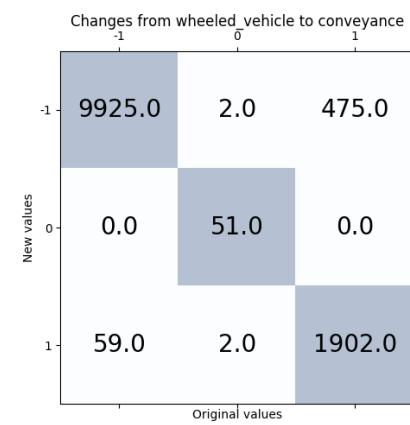
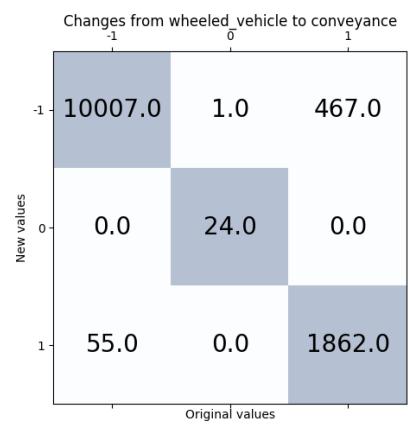
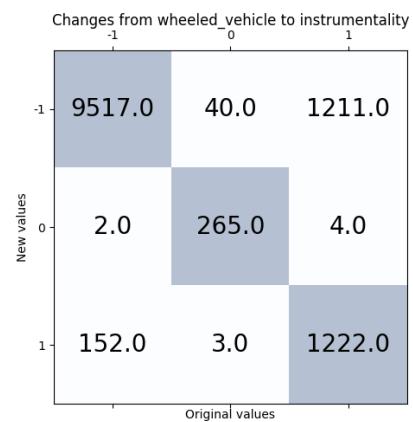
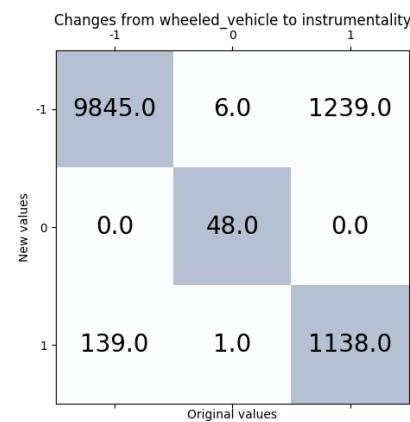
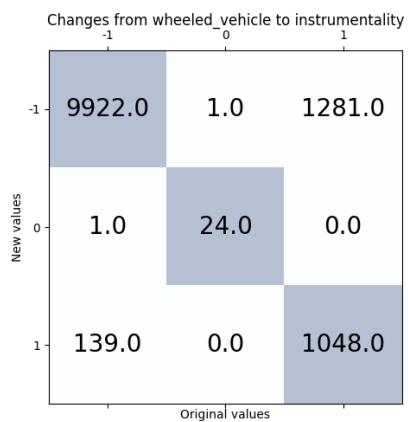
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