

Image to Code

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Component	Total images (.png)	total codes (.json)
Button	3296	3296
Switch	402	402
Card	2706	2706
Checkbox	1614	1614
Icon	5791	5791
total	13809	13809
	27618	

file name example-

00tGyTg92zwAAGyy1L6K.json

00tGyTg92zwAAGyy1L6K.png



all code file names match with
image file names

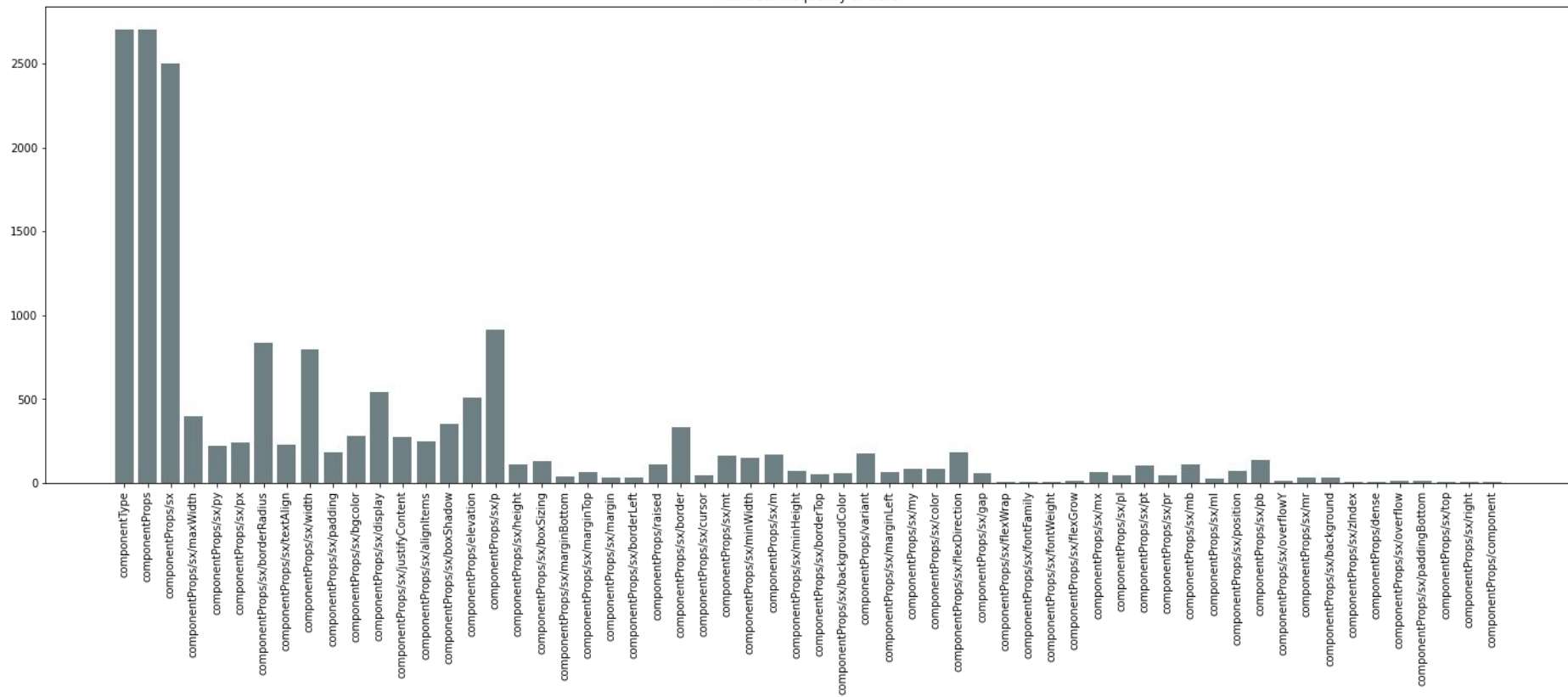


Total **150** unique (flattened) attributes found across all components

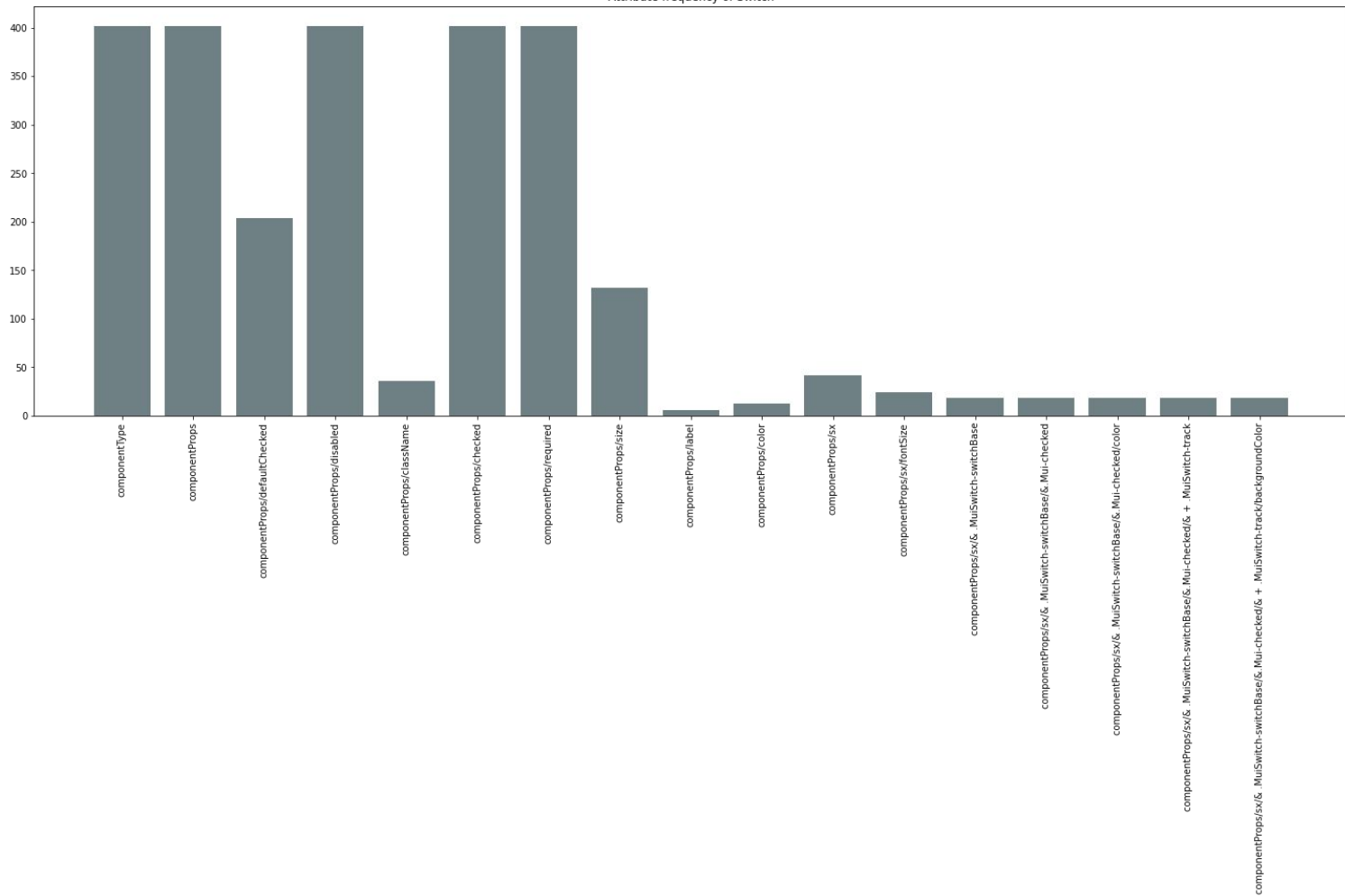


No information on the default values of the attributes is available

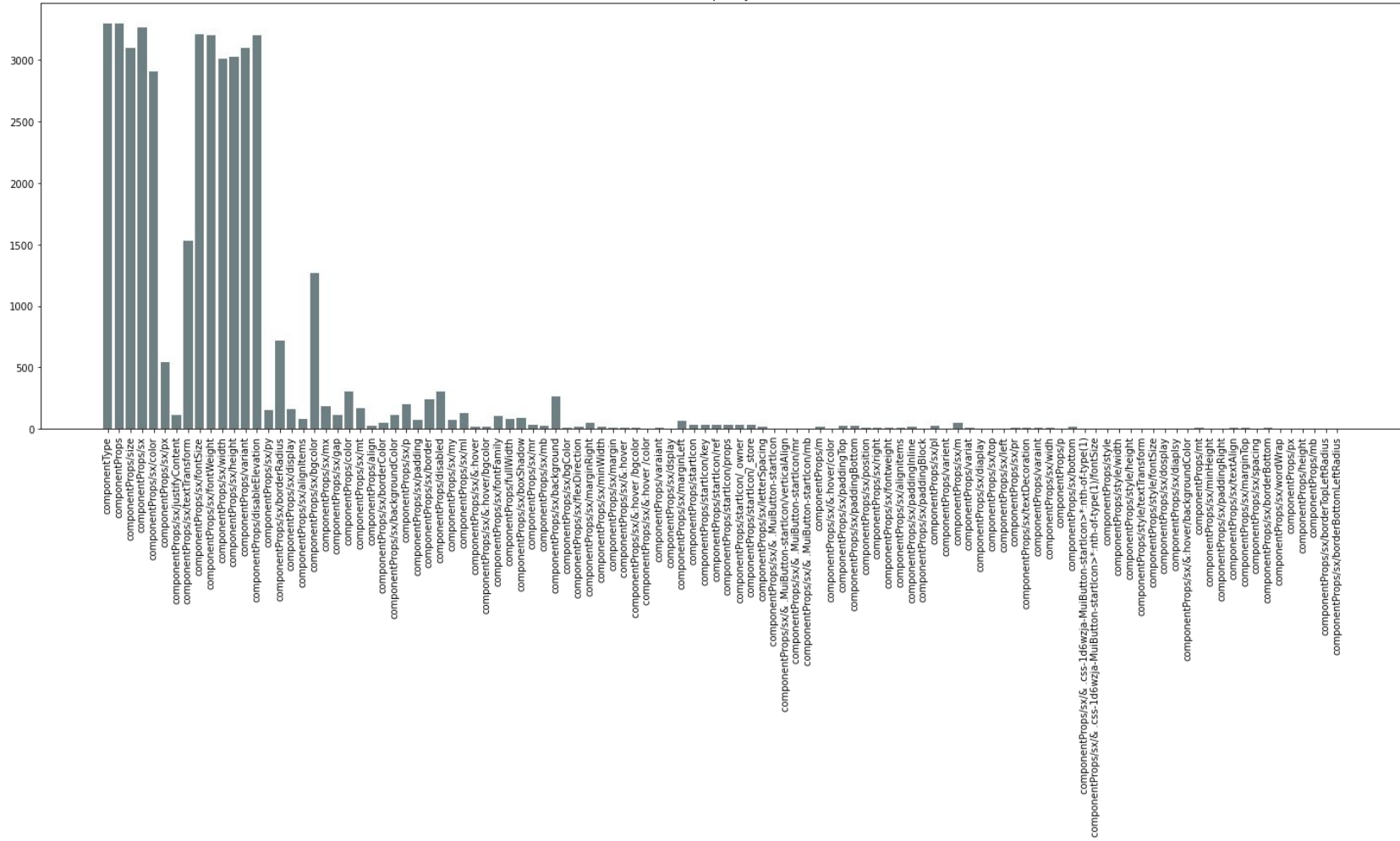
Attribute frequency of Card



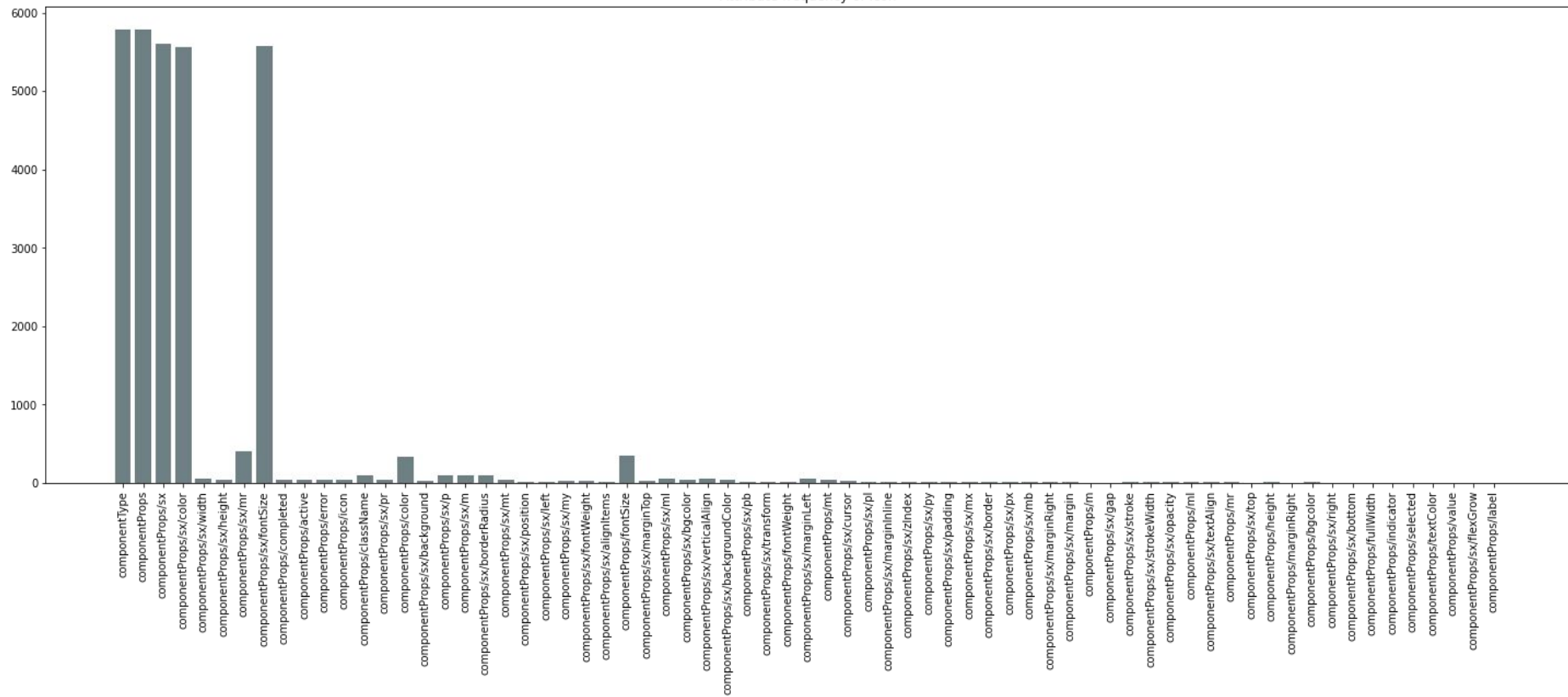
Attribute frequency of Switch



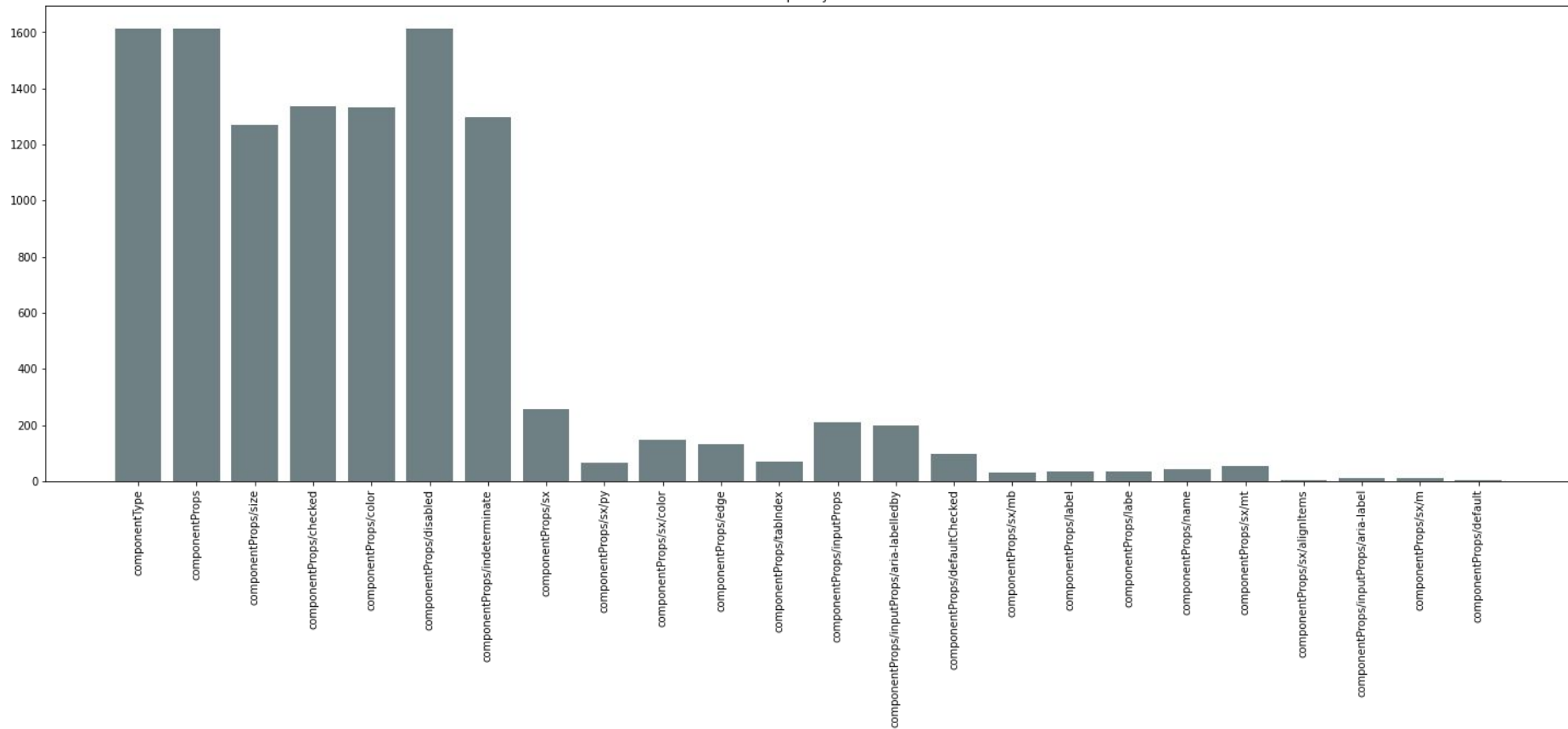
Attribute frequency of Button



Attribute frequency of Icon



Attribute frequency of Checkbox



	componentP rops/sx/flex Grow	componentP rops/sx/& .MuiButton- startIcon/m r	componentP rops/m	componentP rops/style/wi dth	componentP rops/style/h eight	componentP rops/px	componentP rops/height	componentP rops/mb	componentP rops/icon	componentP rops/fontWe ight	componentP rops/ml	componentP rops/value	componentP rops/tabInd ex
count	14	3	16	5	5	3	6	2	38	6	4	1	72
mean	0.428571	0	1.25	115	30	3	8	2	3.578947	350	2.5	0	-1
std	0.513553	0	0.447214	0	0	0	1.549193	0	1.637922	122.474487	1.732051	NaN	0
min	0	0	1	115	30	3	7	2	1	300	1	0	-1
0.25	0	0	1	115	30	3	7	2	2	300	1	0	-1
0.5	0	0	1	115	30	3	7	2	3.5	300	2.5	0	-1
0.75	1	0	1.25	115	30	3	9.25	2	5	300	4	0	-1
max	1	0	2	115	30	3	10	2	6	600	4	0	-1

refer to reports/pureCode.xlsx for more analysis


```
"componentType": "Button",
"componentProps": {
  "variant": "text",
  "sx": {
    "color": "#f8be7c",
    "bgcolor": "white",
    "border": "2px solid #f8be7c",
    "borderRadius": "10px",
    "textTransform": "none",
    "fontWeight": 500,
    "fontSize": "15px",
    "width": "77.578125px",
    "height": "38.25px"
  },
  "size": "small",
  "disableElevation": false
}
```

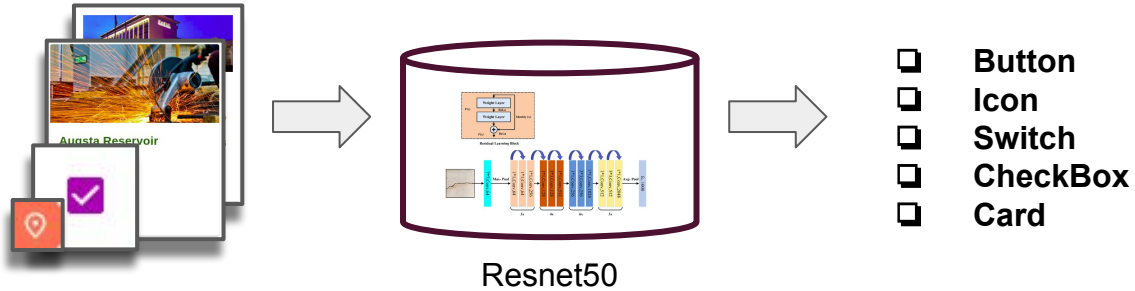
Challenges:

- Heterogeneous representations:
 - properties regarding color may be have multiple representations ex: white, #f8be7c
 - componentProps/sx/maxWidth can be represented in px or %
- One attribute may have multiple values ex - "border": "2px solid black"

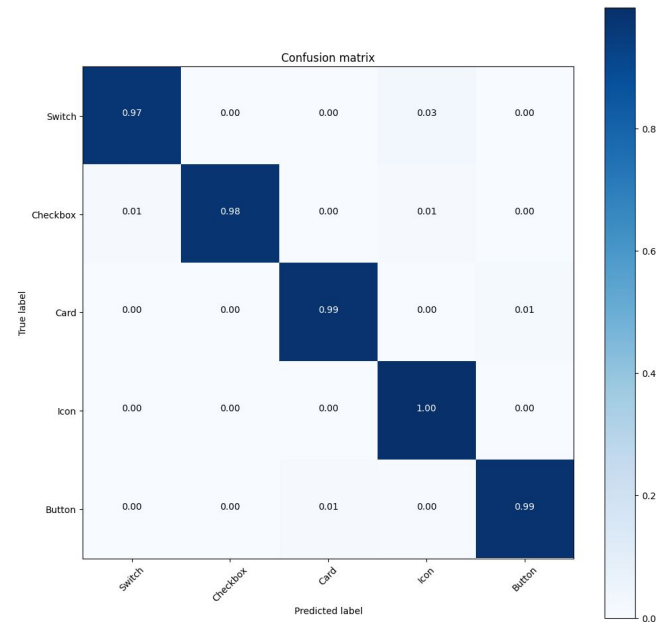
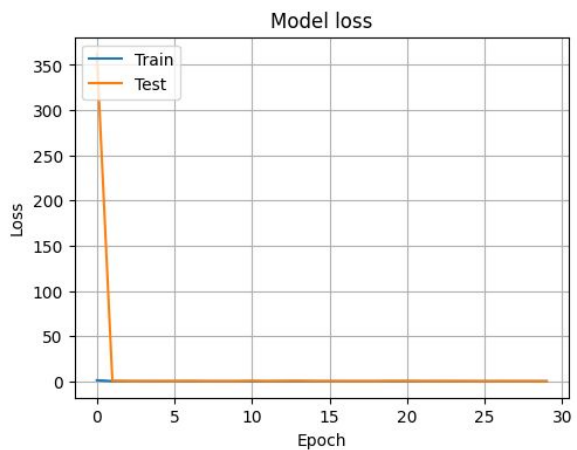
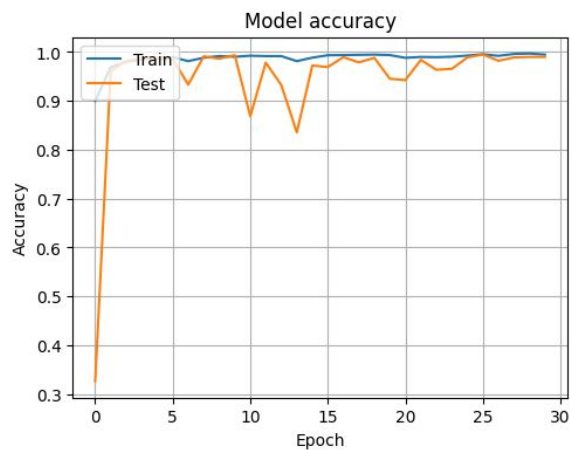
Potential caveats for over fitting

- **Some elements have** a constant value throughout the dataset, while the domain knowledge suggests that this need not always be the case. ex:
 - **componentProps/style/width** = 115.0
 - **componentProps/style/height** = 30.0

Component Classification using CNN

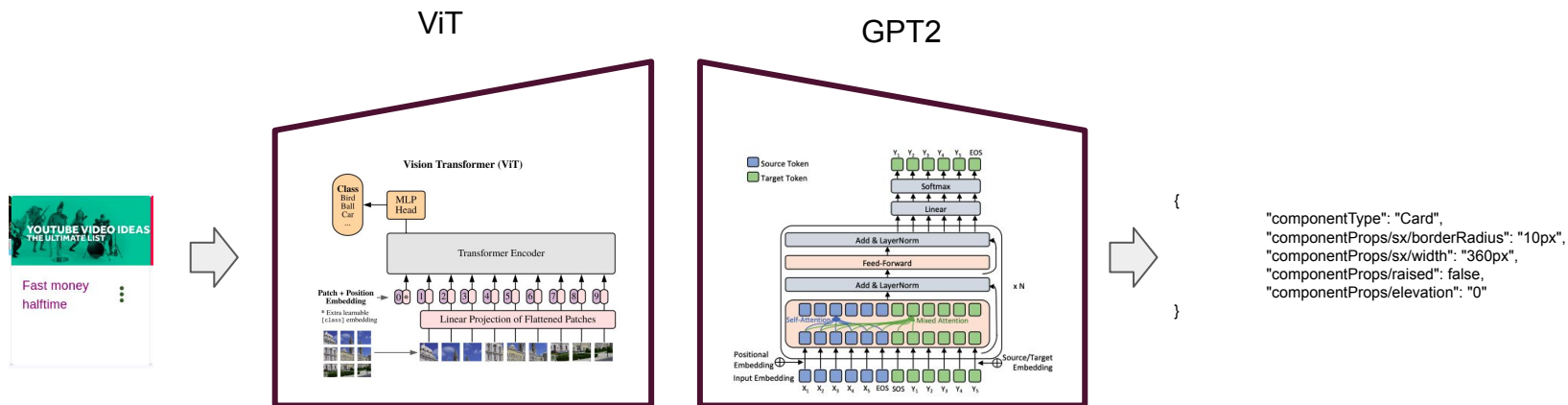


- Used ResNET50 for a multiclass classification
- Loss function used: categorical_crossentropy
- Optimizer: Adam



	precision	recall	f1-score	support
Switch	0.96	0.97	0.97	75
Checkbox	1.00	0.98	0.99	340
Card	0.99	0.99	0.99	537
Icon	0.99	1.00	1.00	1166
Button	0.99	0.99	0.99	644
accuracy			0.99	2762
macro avg	0.99	0.99	0.99	2762
weighted avg	0.99	0.99	0.99	2762

- Model could classify the component from a given image with 99% accuracy



Generate the json text from images using Image summarisation

- An Encoder Decoder model is used
- A vision transformer is used as an encoder
- GPT2 is used as a decoder
- ROGUE

1. Read image (PIL.Image())
2. Transform image
 - a. **Resizing** the image to (224,224)
 - b. **Normalizing** the image
 - c. Converting the image to **Tensor**
3. Extract the pixel values from the image using feature extractor
4. Load captions from the dataframe
5. Tokenize the captions
6. Pad the tokenized captions to max length
7. return tokenized captions and images