<div align="center">**PCA Conclusion**</div>

The eigenvectors from PCA can be found on folder */reports/data* with files *pca_{room}_eigenvectors.csv*

# 1. Features' distribution

## Conference Room data
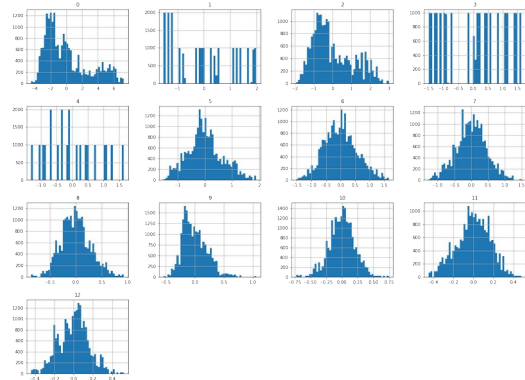
<div align="center">Without PCA</div>

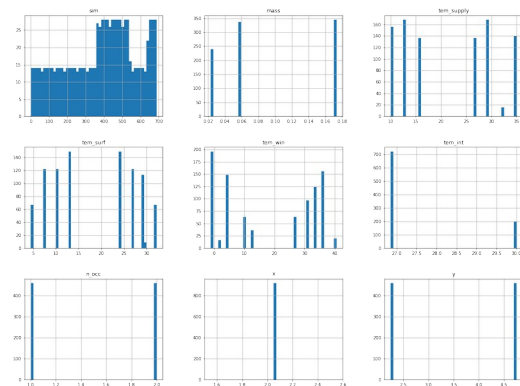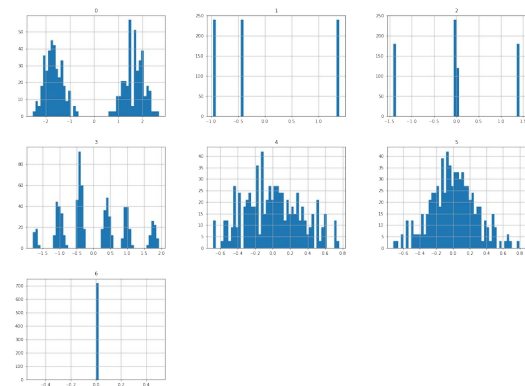<div align="center">With PCA</div>



## Enclosed Office

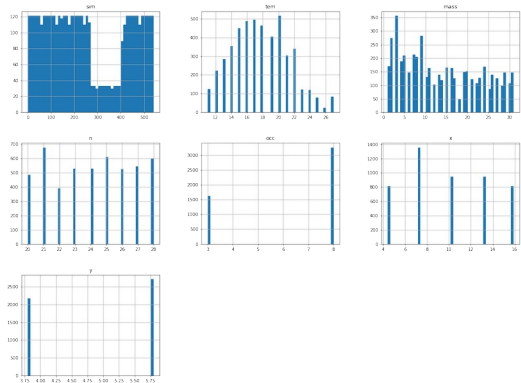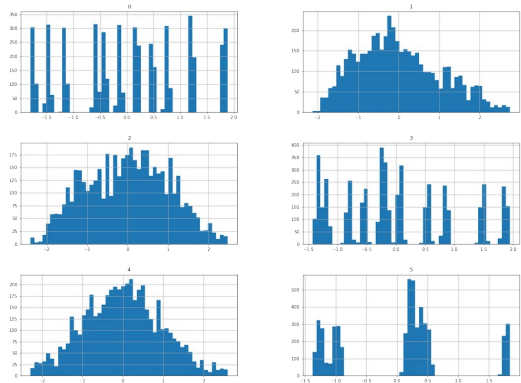<div align="center">Without PCA</div>

<div align="center">With PCA</div>
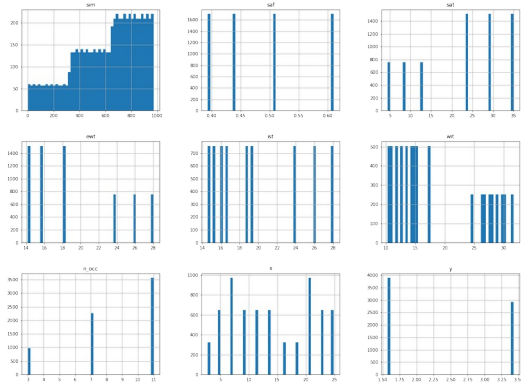
# Open Office

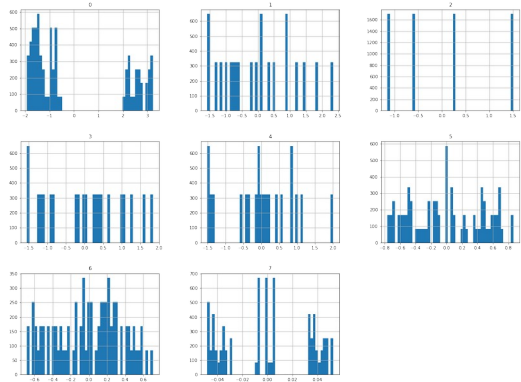## Without PCA



## With PCA



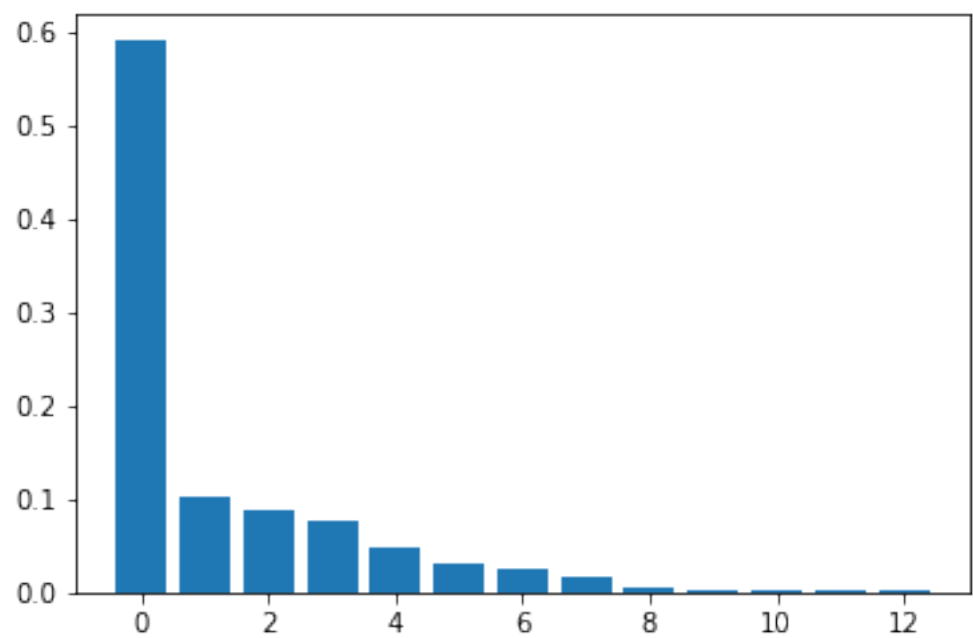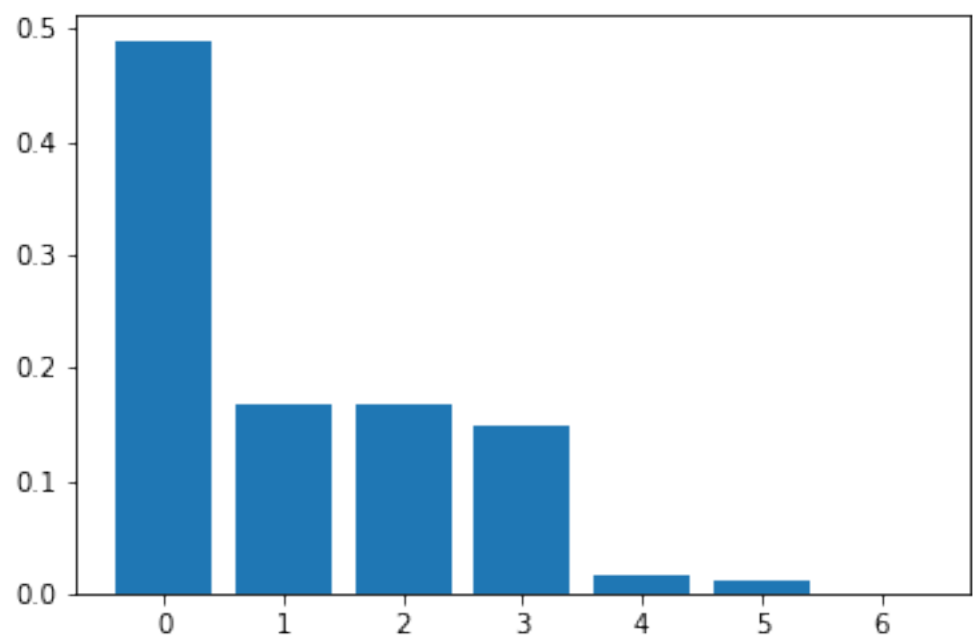# Small Office

## Without PCA



## With PCA
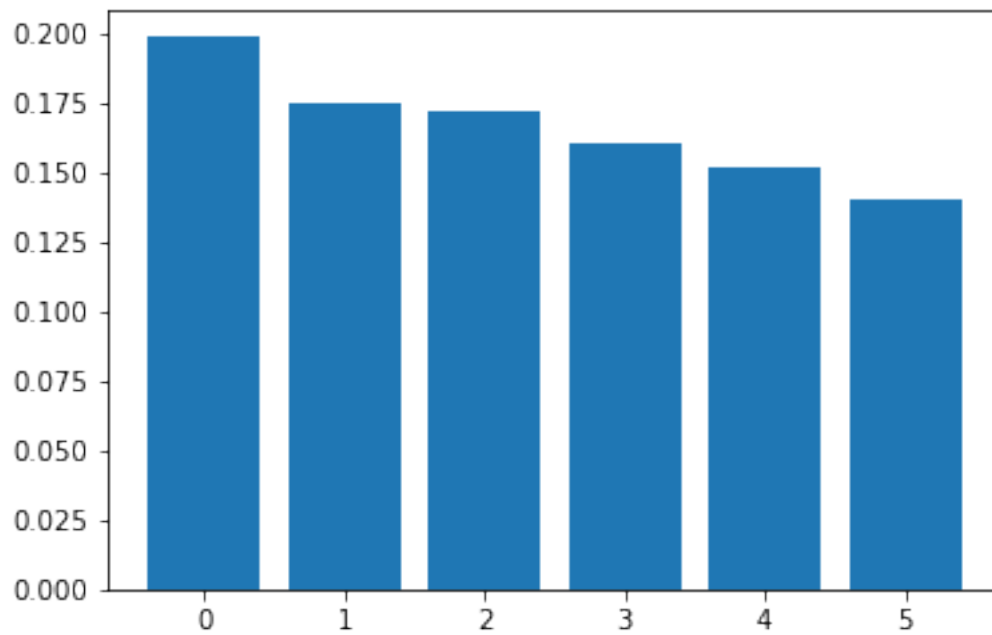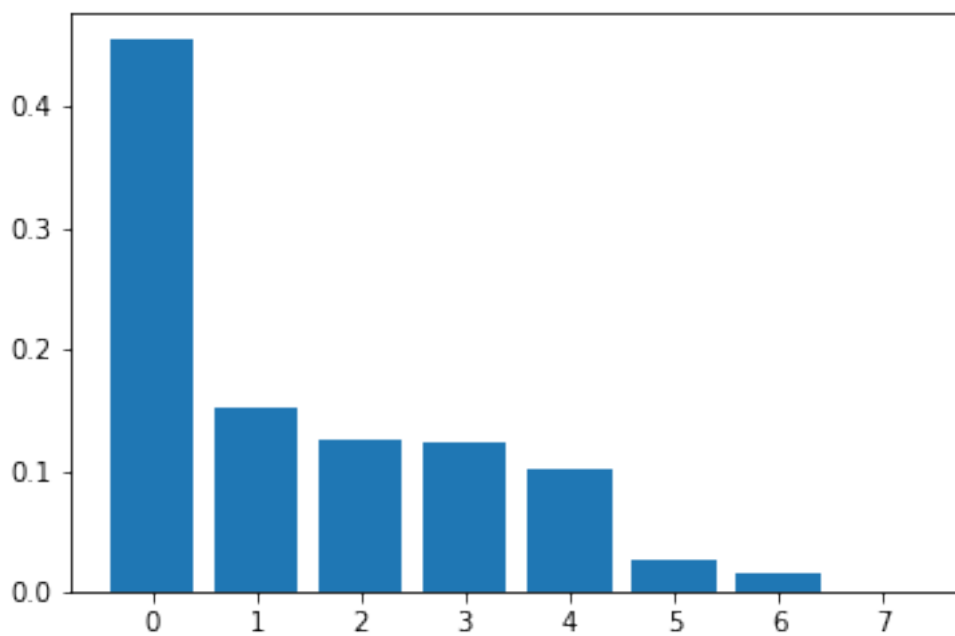
## 2. PCA's Explained Variance Ratio

**Conference Room data**



**Enclosed Office**

**Open Office**



**Small Office**



## 3. PCA Evaluation on Machine Learning models

### 3.1 Linear Regression

| | MSE without PCA | MSE with PCA | Training time without PCA | Training time with PCA |
|---|---|---|---|---|
| Conference Room with target MRT | 0.0363 | 0.0363 | 0.0126 | 0.0143 |
| Conference Room with target T | 0.1325 | 0.1325 | 0.0094 | 0.0113 |
| Conference Room with target V | 0.0011 | 0.0011 | 0.0147 | 0.0123 |
| Enclosed Office with target MRT | 1.7880 | 1.7880 | 0.0037 | 0.0034 |
| Enclosed Office with target T | 3.0036 | 3.0036 | 0.0052 | 0.0041 |
| Enclosed Office with target V | 0.0017 | 0.0017 | 0.0046 | 0.0067 |
| Open Office with target MRT | 0.0025 | 0.0025 | 0.0053 | 0.0073 |
| Open Office with target T | 0.0412 | 0.0412 | 0.0065 | 0.0059 |
| Open Office with target V | 0.0002 | 0.0002 | 0.0080 | 0.0064 |
| Small Office with target MRT | 0.4468 | 0.4468 | 0.0096 | 0.0070 |
| Small Office with target T | 0.1658 | 0.1658 | 0.0043 | 0.0080 |
| Small Office with target V | 0.0004 | 0.0004 | 0.0067 | 0.0075 |

## 3.2 Feedforward Neural Network

| | MSE without PCA | MSE with PCA | Training time without PCA | Training time with PCA |
|---|---|---|---|---|
| Conference Room with target MRT | 0.0059 | 0.0023 | 190.46 | 200.49 |
| Conference Room with target T | 0.0282 | 0.0168 | 198.22 | 199.61 |
| Conference Room with target V | 0.0003 | 0.0003 | 203.27 | 193.58 |
| Enclosed Office with target MRT | 0.1429 | 0.1337 | 8.6314 | 6.0204 |
| Enclosed Office with target T | 0.5687 | 0.2845 | 6.2719 | 6.1693 |
| Enclosed Office with target V | 0.0004 | 0.0003 | 6.2108 | 6.2445 |
| Open Office with target MRT | 0.0024 | 0.0027 | 43.7616 | 44.0263 |
| Open Office with target T | 0.0266 | 0.1383 | 45.3539 | 46.2882 |
| Open Office with target V | 0.0001 | 0.0002 | 47.3532 | 44.3448 |
| Small Office with target MRT | 0.0614 | 0.0128 | 66.4922 | 64.8353 |
| Small Office with target T | 0.0842 | 0.0151 | 67.4418 | 66.7365 |
| Small Office with target V | 5.5294e-05 | 5.3817e-05 | 64.6739 | 0.0075 |