

Group 7

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KNN+PCA

- Simple strategy
- PCA for dimensionality reduction
- Selected configuration: K=9 and PCA=10 (25.91% of the energy)
- Good tradeoff between dimensionality and CER with 10 PC

```
python mini_project.py -PCA -c 10 -kNN -nn 9
```

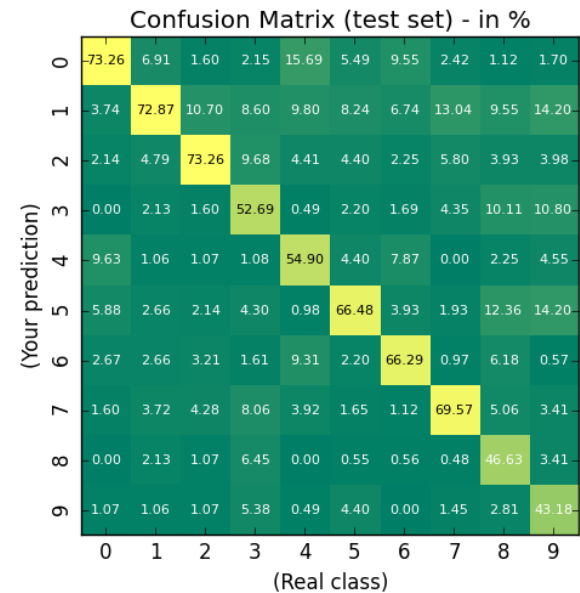
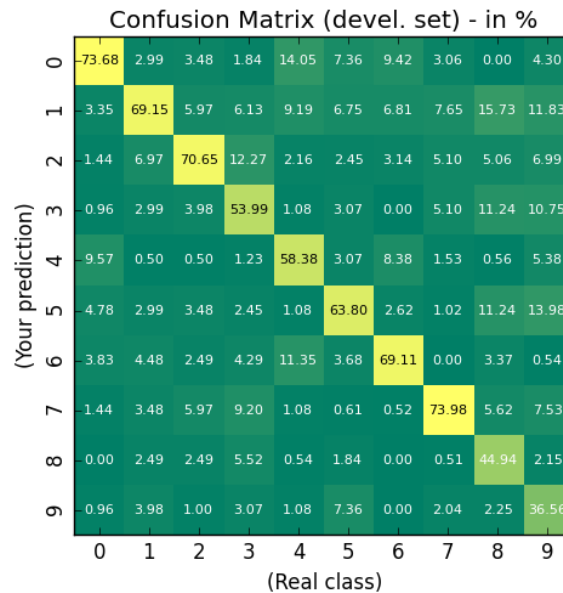
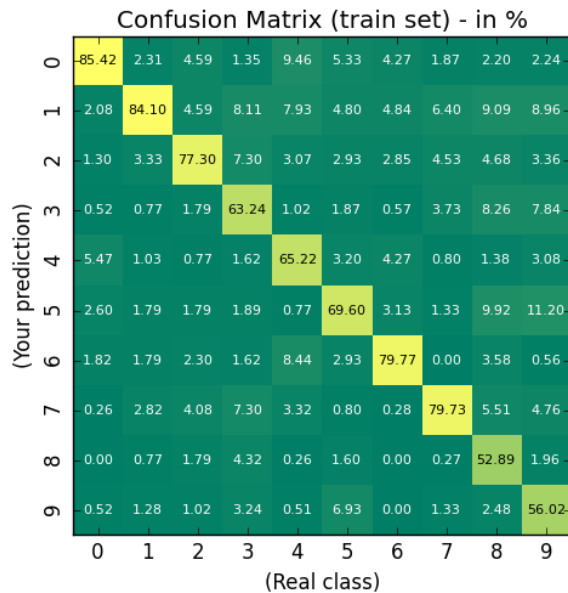
```
CER Train: 28.50%
```

```
CER Dev: 38.07%
```

```
CER Eval: 37.91%
```

KNN+PCA

- Confusion matrix



GMM+PCA

- Generative approach to model the digits
- PCA for dimensionality reduction
- Number of gaussian components 150

```
python mini_project.py -PCA -c 10 -GMM -nb_gaus  
150
```

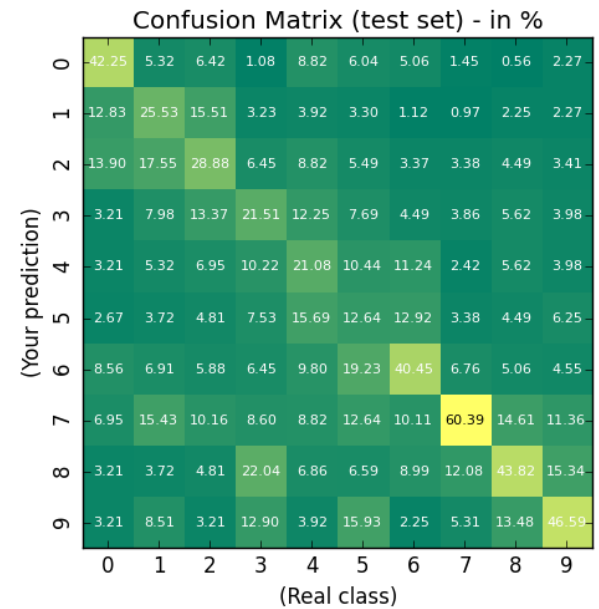
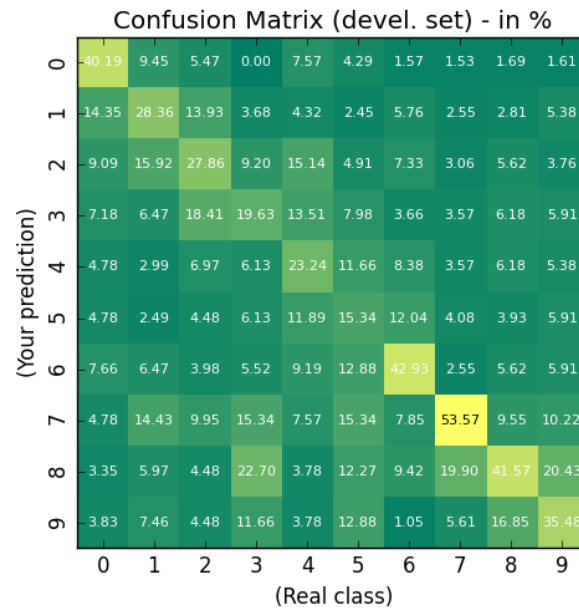
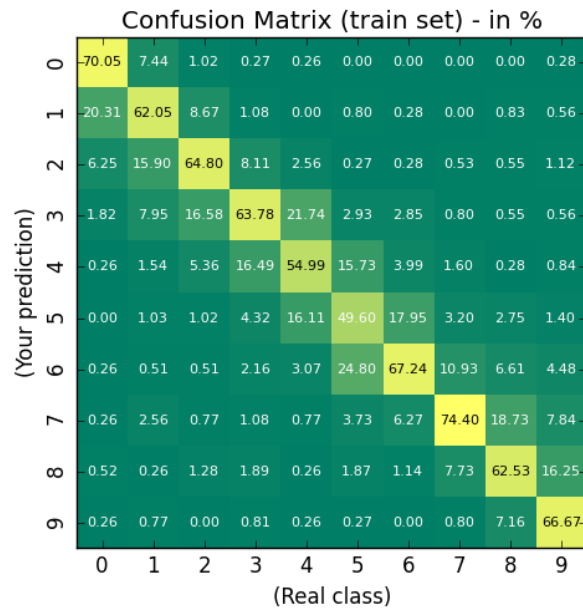
```
CER Train: 36.45%
```

```
CER Dev: 66.68%
```

```
CER Eval: 65.62%
```

GMM+PCA

- Confusion matrix



GMM+PCA

Clear overfitting: modelling with less gaussian components:

```
python mini_project.py -PCA -c 10 -GMM -nb_gaus  
16
```

```
CER Train: 62.54%
```

```
CER Dev: 67.70%
```

```
CER Eval: 65.46%
```

- We believe that the GMM was modelled in a wrong way