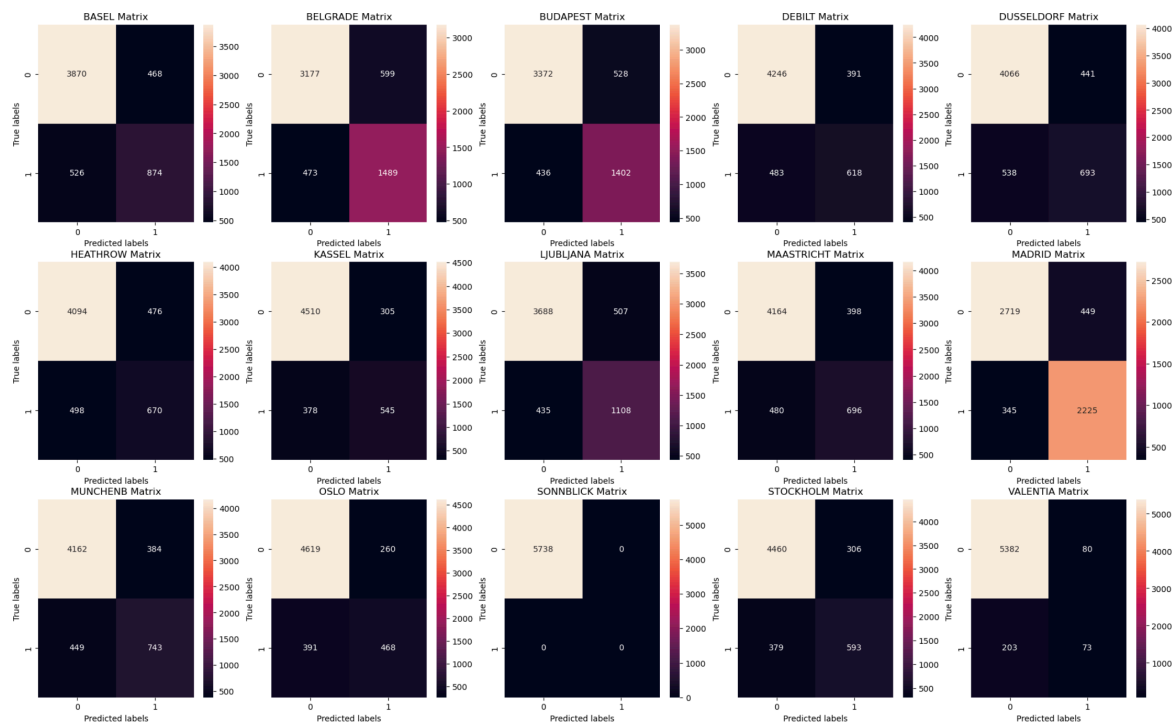
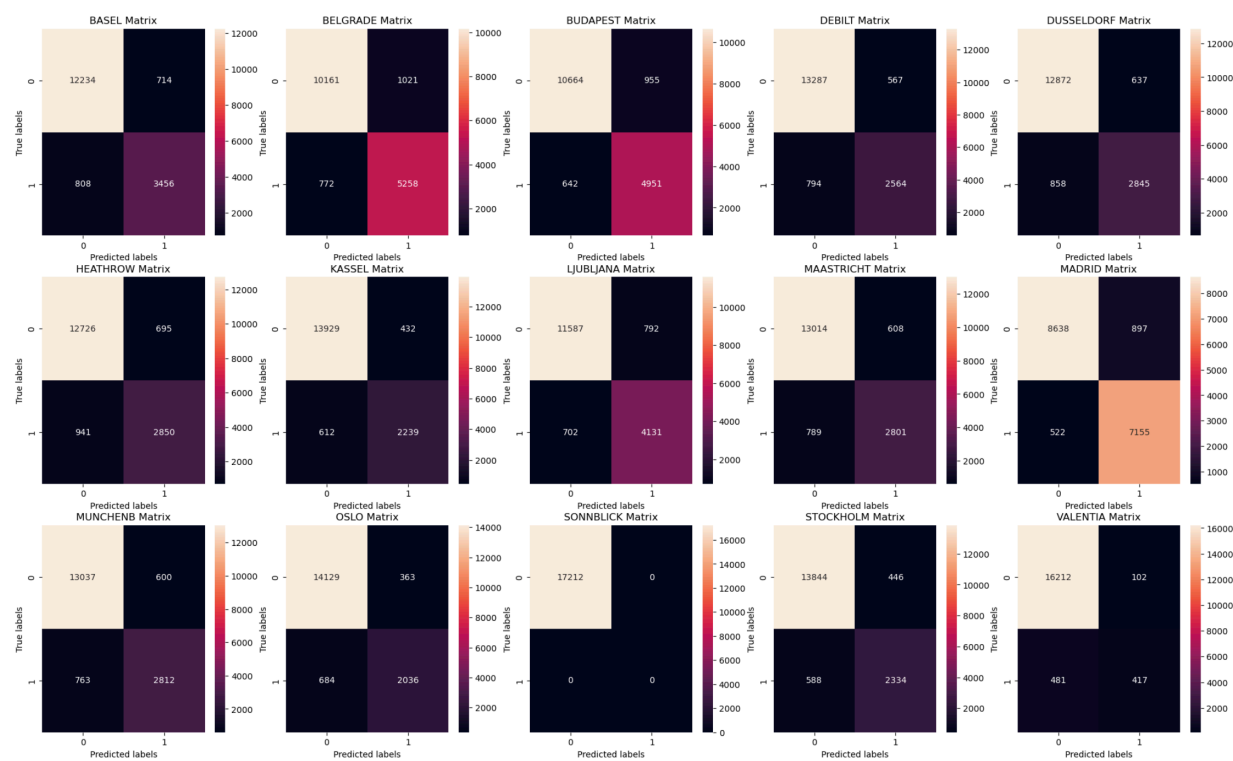


Confusion Matrix - Test Data:



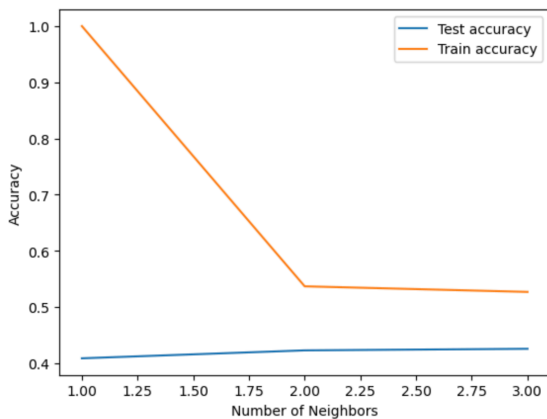
Weather Station	Accurate Predictions		False Unpleasant	False Pleasant	Accuracy Rate
Basel	3870	874	468	526	83%
Belgrade	3177	1489	599	526	81%
Budapest	3372	1402	391	483	85%
Debilt	4246	618	391	483	85%
Dusseldorf	4066	693	441	538	83%
Heathrow	4094	670	476	498	83%
Kassel	4510	545	305	378	88%
Ljubljana	3688	1108	507	435	84%
Maastricht	4164	696	398	480	85%
Madrid	2719	2225	449	345	86%
Munchenb	4162	743	384	449	85%
Oslo	4619	468	260	391	89%
Sonnblick	5738	0	0	0	100%
Stockholm	4460	593	306	379	88%
Valentia	5382	73	80	303	93%
				Total Average	86%

Confusion Matrix - Train Data:



Weather Station	Accurate Predictions		False Unpleasant	False Pleasant	Accuracy Rate
Basel	12234	3456	714	808	91%
Belgrade	10161	5258	1021	772	90%
Budapest	10664	4951	955	642	91%
Debilt	13287	2564	567	794	92%
Dusseldorf	12872	2845	637	858	91%
Heathrow	12726	2850	695	941	90%
Kassel	13929	2239	432	612	94%
Ljubljana	11587	4131	792	702	91%
Maastricht	13014	2801	608	789	92%
Madrid	8638	7155	897	522	92%
Munchenb	13037	2812	600	763	92%
Oslo	14129	2036	363	684	94%
Sonnblick	17212	0	0	0	100%
Stockholm	13844	2334	446	588	94%
Valentia	16212	417	102	481	97%
				Total Average	93%

Observations:



After comparing both the testing and training data confusion matrixes for all 15 weather stations, we can begin to draw some initial conclusions about weather temperatures and “pleasantness” when using the K Nearest Neighbors algorithm to help determine weather prediction accuracy.

1. **Number of Neighbors:** after fitting the KNN model, you can see the relationship between number of neighbors and model accuracy has a decrease in accuracy after 2 neighbors for training data.
2. **Algorithm Prediction Accuracy:** the test data confusion matrix shows about an 86% accuracy when used to predict false positive or false negative weather “pleasantness” ratings. The training data has about a 93% prediction accuracy, but this is overly optimistic results as the model has already seen the data during the testing predictions.
3. **Full Accuracy:** the Sonnblick station shows a fully accurate prediction, meaning that this could be an instance of overfitting, where the model memorized the training data and is not generalizing well, or perhaps there are limited features for this particular weather station causing it be limited to only certain conditions, making it less accurate. Also, finding Sonnblick on a map shows the top of a mountain in Austria...perhaps there are truly no pleasant days there as it’s always...cold?
4. **Overfitting:** other than Sonnblick, stations such as Valentia or Oslo have slightly higher accuracy percentages, which could also indicate cases of overfitting. With the higher accuracy rates on the training set, this could definitely indicate cases as overfitting as this possibly indicates data leakage as mentioned above with the model already being run on the test data. The variety in the data might be biased towards certain weather conditions, thus making it more challenging for the model to predict newer, more diversified weather conditions.
5. **Dataset Features / Bias:** In general, it would seem that having a “pleasantness” rating score is already a relative, biased value—people will have their own view of whether or not *weather* feels either pleasant or unpleasant (i.e. some might appreciate sunny days in Valentia while others might think this is too hot or uncomfortable, whereas all might agree a freezing day on top of a mountain is unpleasant). Also, when you have stations with more or less differing degrees of weather patterns, this could create bias towards certain conditions, further throwing off the model predictions.