資料分析方法-HW7

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Q1:

	LR	KNN	SVM
accuracy	0.958333	0.950000	0.950000
sensitivity	1.000000	1.000000	0.970874
specificity	0.705882	0.647059	0.823529
precision	0.953704	0.944954	0.970874

Based on the results, the accuracy of all three algorithms is roughly the same. LR and KNN have predicted men's outcomes with 100% accuracy. However, SVM has a higher accuracy for predicting women's outcomes compared to the other two algorithms, and its precision is also superior to the other two. In conclusion, I consider that SVM is a better algorithm for estimating the data set “ORL Faces”.

Q2:

```
len(important_features)
✓ 0.0s

95
```

	LR	KNN	SVM
accuracy	0.950000	0.958333	0.950000
sensitivity	1.000000	1.000000	1.000000
specificity	0.647059	0.705882	0.647059
precision	0.944954	0.953704	0.944954

I used LASSO regression with a tuning parameter of 0.01 to select significant pixels, and the results are displayed above. 95 features were selected, and the accuracy is comparable to the results in EX1. However, it's worth noting that the specificity and precision of SVM decrease after feature selection.

Q3:

	LR	KNN	SVM
accuracy	0.601695	0.610169	0.627119
sensitivity	0.500000	0.478261	0.625000
specificity	0.984127	0.968254	0.984615
precision	0.900000	0.846154	0.909091

Based on the results, the accuracy of all three algorithms is similar. Additionally, all three algorithms demonstrate good specificity, but poor sensitivity. However, when considering all indicators, SVM exhibits better performance compared to the other two algorithms.