RESULTS AND COMPARISON OF THE MODELS

SVM Model Results:

```
'svm results'
'The accuracy is:'
0.9649122807017544
'The Precision is:'
0.9791666666666666
'The Recall is:'
0.94
'The F1 Score is:'
0.9591836734693877
'The Sensitivity is:'
0.94
'The Specificity is:'
0.984375
```

Accuracy (96.49%): SVM correctly classifies most cases with fewer errors than KNN. It is the more reliable model overall.
Precision (97.92%): When SVM predicts a positive case, it is correct 97.92% of the time. This means fewer false positives.
Recall (94%): SVM correctly identifies 94% of actual positive cases. It reduces the risk of missing important positive cases.
F1 Score (95.92%): SVM maintains a strong balance between precision and recall. This makes it well-suited for imbalanced datasets.
Sensitivity (94%): SVM correctly detects 94% of all true positive cases. It is better at catching positives than KNN.
Specificity (98.44%): SVM correctly identifies 98.44% of negative cases. It is equally good at this as KNN.

KNN Model Results:

```
'knn results'
'The accuracy is:'
0.956140350877193
'The Precision is:'
0.9787234042553191
'The Recall is:'
0.92
'The F1 Score is:'
0.9484536082474226
'The Sensitivity is:'
0.92
'The Specificity is:'
0.984375
```

Accuracy (95.61%): KNN is slightly less accurate than SVM but still performs well. It makes slightly more mistakes than SVM.
Precision (97.87%): KNN correctly predicts positives 97.87% of the time, very close to SVM. It slightly increases false positives compared to SVM.
Recall (92%): KNN correctly identifies 92% of actual positives, which is lower than SVM. It is more likely to miss some positive cases.
F1 Score (94.85%): KNN balances precision and recall well but not as effectively as SVM. It is still a strong performer for classification tasks.
Sensitivity (92%): KNN catches 92% of all true positives, which is lower than SVM. It may not be as reliable for detecting positives.
Specificity (98.44%): KNN correctly identifies 98.44% of negative cases, the same as SVM. Both models are equally effective at avoiding false positives.

Comparison of the results:

The SVM model performs better than the KNN model in almost all areas. It has a higher accuracy (96.49% vs. 95.61%), meaning it makes fewer mistakes overall. SVM also has better precision (97.92% vs. 97.87%) and recall (94% vs. 92%), showing that it is more reliable in correctly identifying positive cases. The F1 score (95.92% vs. 94.85%) confirms that SVM balances precision and recall better than KNN. Both models have the same specificity (98.44%), meaning they are equally good at identifying negative cases. If the goal is to reduce false negatives, SVM is the better choice. Overall, SVM is the better model for this task.