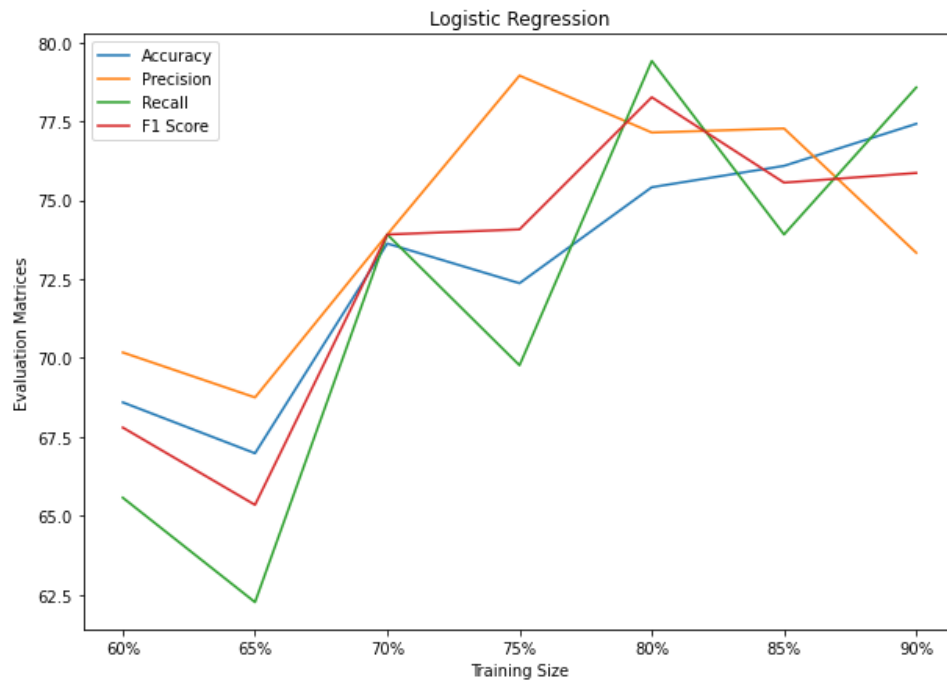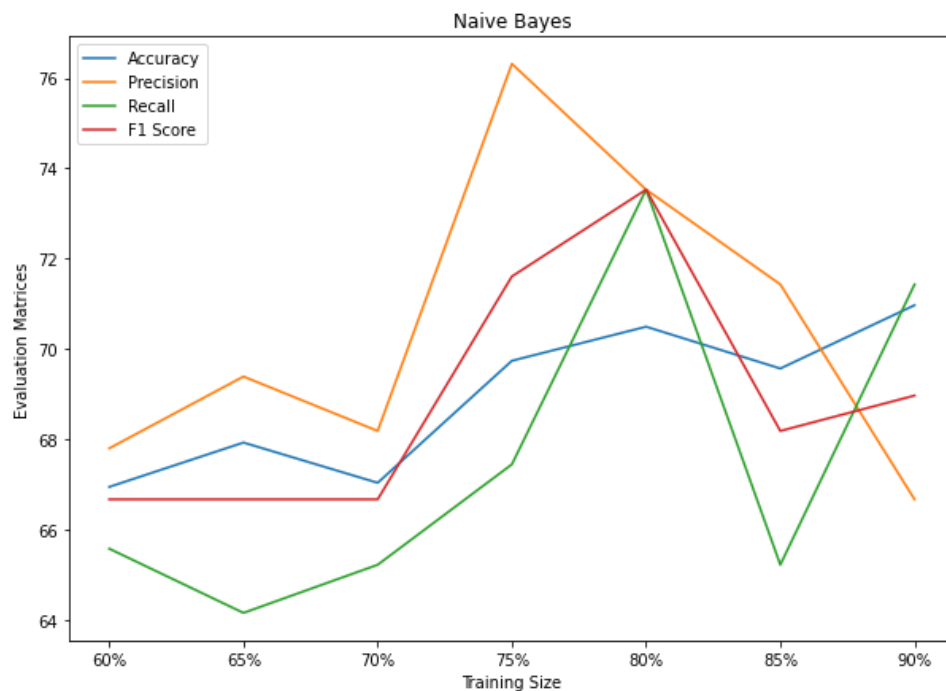# Heart Attack Prediction

[Report]

SKY TEAM

1. Ashraf Abdulkhaliq Bassunoi Abdulaziz [1]

2. Ahmed Elsayed Mohamed Abo-elkher [1]

3. Ahmed Mostafa Ragab Mostafa [1]

4. Saif El-den Emad Abdulhamid [2]

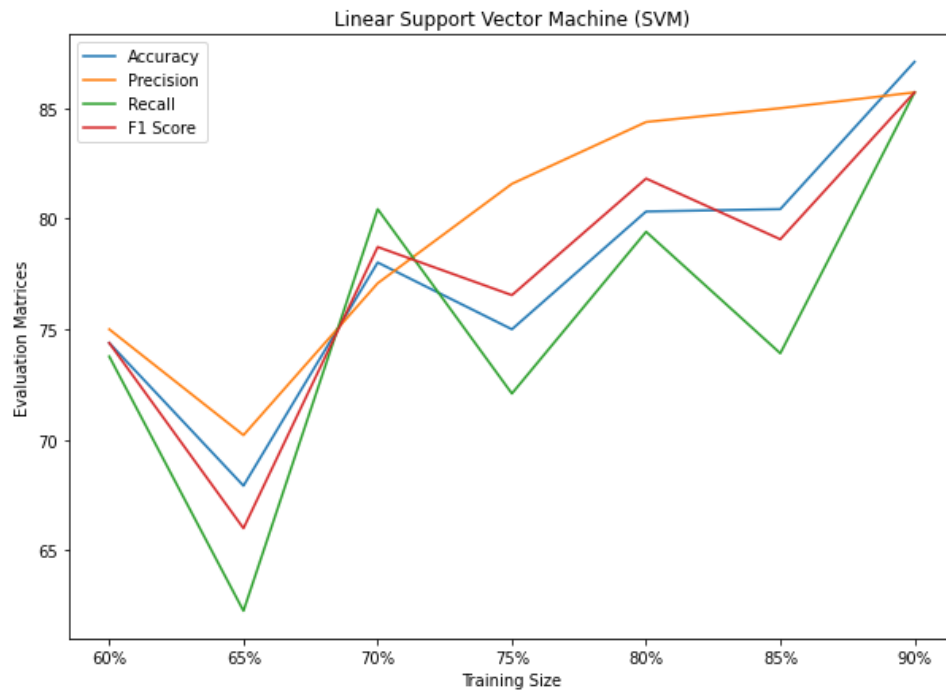5. Abdulsalam Othman Abdulsalam El-khedr [2]

Logistic Regression Model:

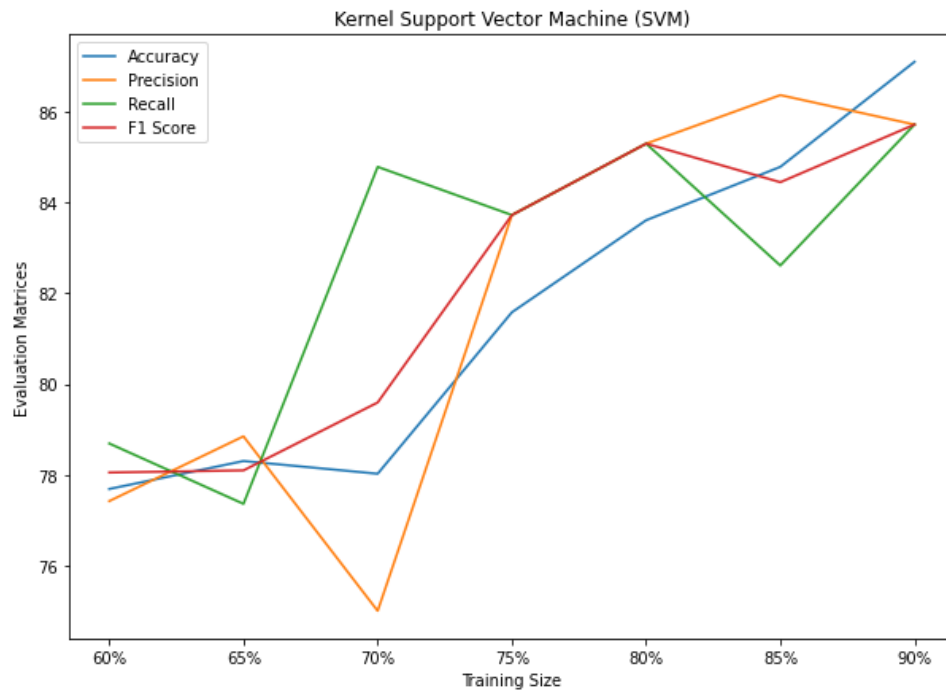| Dataset		Accuracy	Lose	Precision	Recall	F1 Score
Training	Testing					
60%	40%	68.59%	31.40%	70.17%	65.57%	67.79%
65%	35%	66.98%	33.01%	68.75%	62.26%	65.34%
70%	30%	73.98%	26.37%	73.91%	73.91%	73.91%
75%	25%	72.36%	27.63%	78.94%	69.76%	74.07%
80%	20%	75.40%	24.59%	77.14%	79.41%	78.26%
85%	15%	76.08%	23.91%	77.27%	73.91%	75.55%
90%	10%	77.41%	22.58%	73.33%	78.57%	75.86%

Naïve Bayes Model:

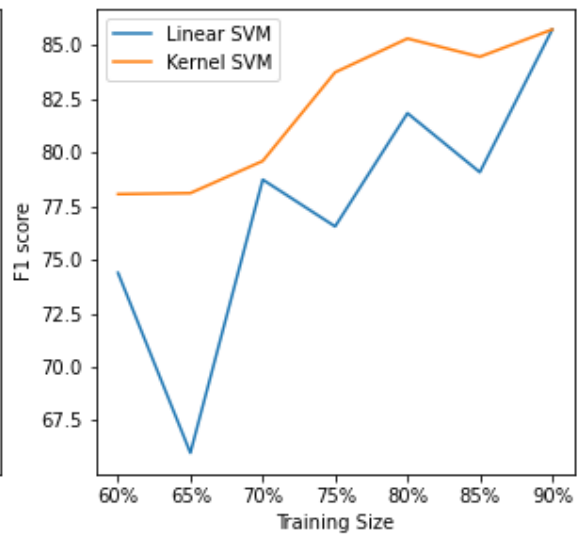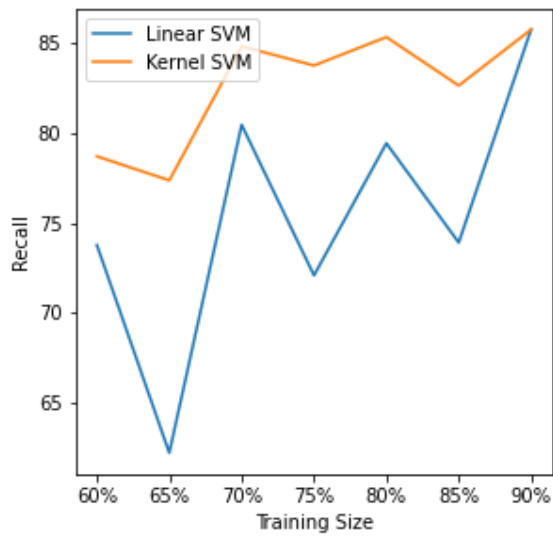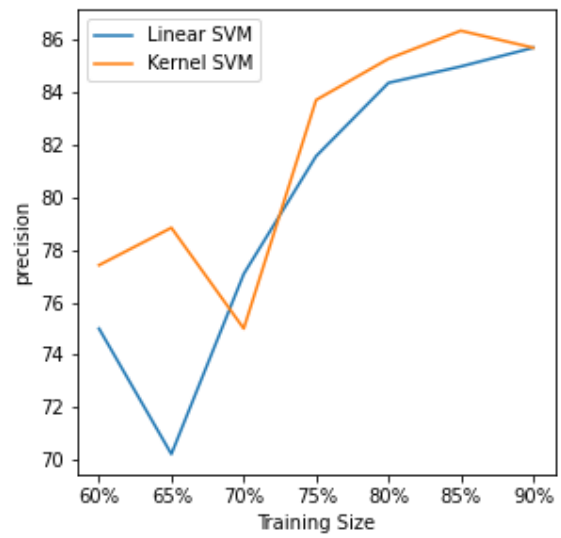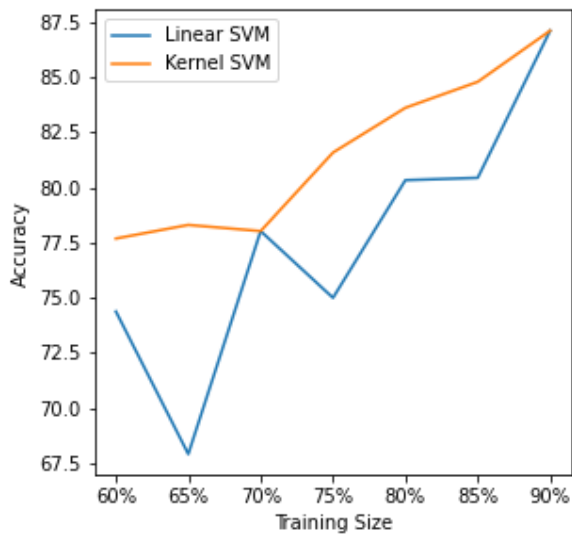| Dataset		Accuracy	Lose	Precision	Recall	F1 Score
Training	Testing					
60%	40%	66.94%	33.05%	67.79%	65.57%	66.66%
65%	35%	67.92%	32.07%	69.38%	64.15%	66.66%
70%	30%	67.03%	32.96%	68.18%	65.21%	66.66%
75%	25%	69.73%	30.26%	76.31%	67.44%	71.60%
80%	20%	70.49%	29.50%	73.52%	73.52%	73.52%
85%	15%	69.56%	30.43%	71.42%	65.21%	68.18%
90%	10%	70.96%	29.03%	66.66%	71.42%	68.96%

Linear SVM Model:

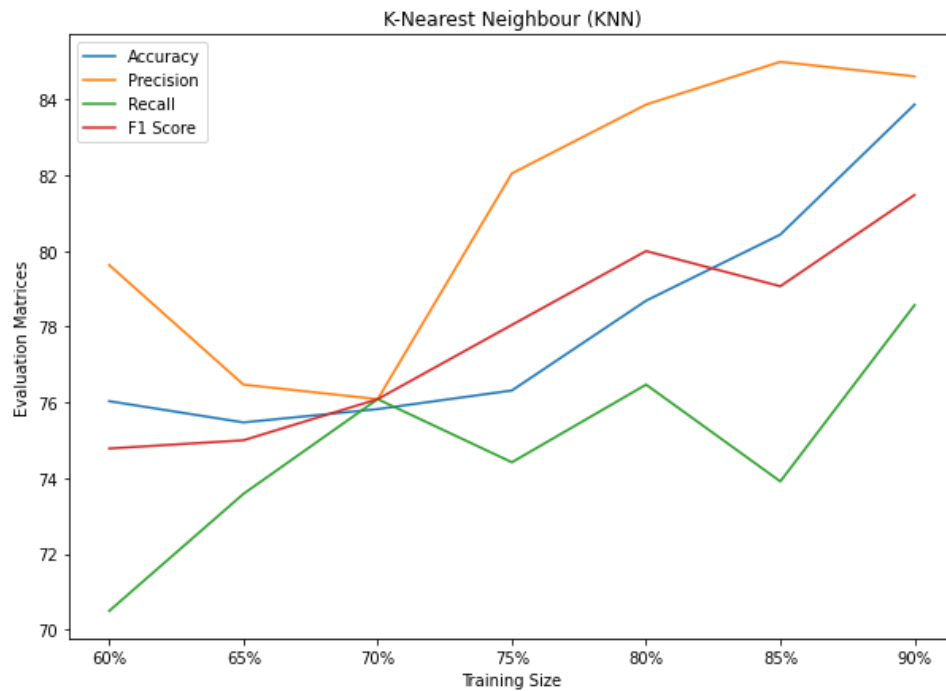| Dataset		Accuracy	Lose	Precision	Recall	F1 Score
Training	Testing					
60%	40%	74.38%	25.61%	75.00%	73.77%	74.38%
65%	35%	67.92%	32.07%	70.21%	62.26%	66.00%
70%	30%	78.02%	21.97%	77.08%	80.43%	78.72%
75%	25%	75.00%	25.00%	81.57%	72.09%	76.54%
80%	20%	80.32%	19.67%	84.37%	79.41%	81.81%
85%	15%	80.43%	19.56%	85.00%	73.91%	79.06%
90%	10%	87.09%	12.90%	85.71%	85.71%	85.71%

Kernel SVM Model:

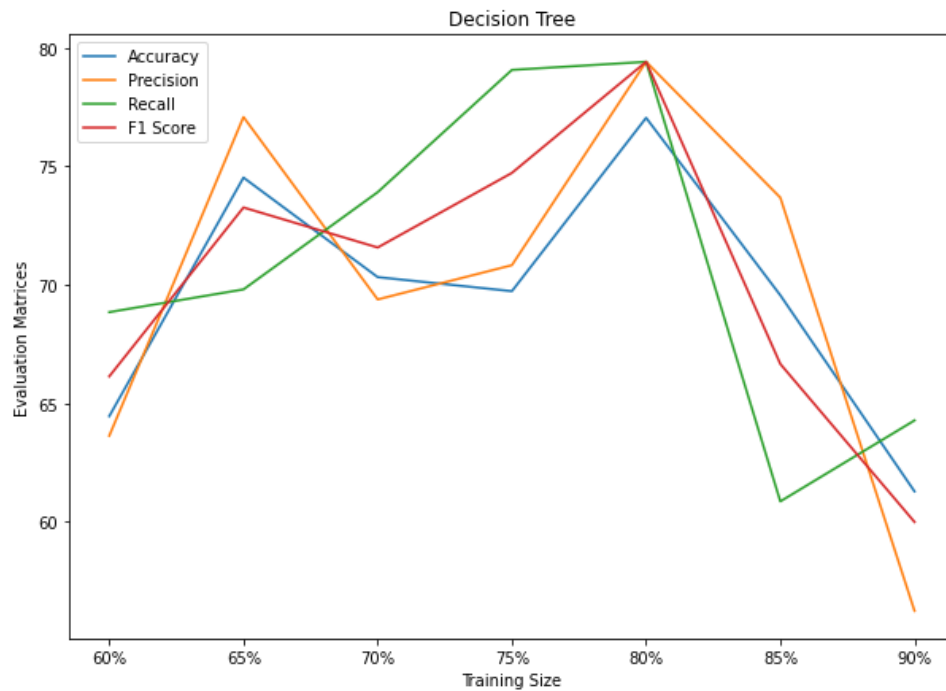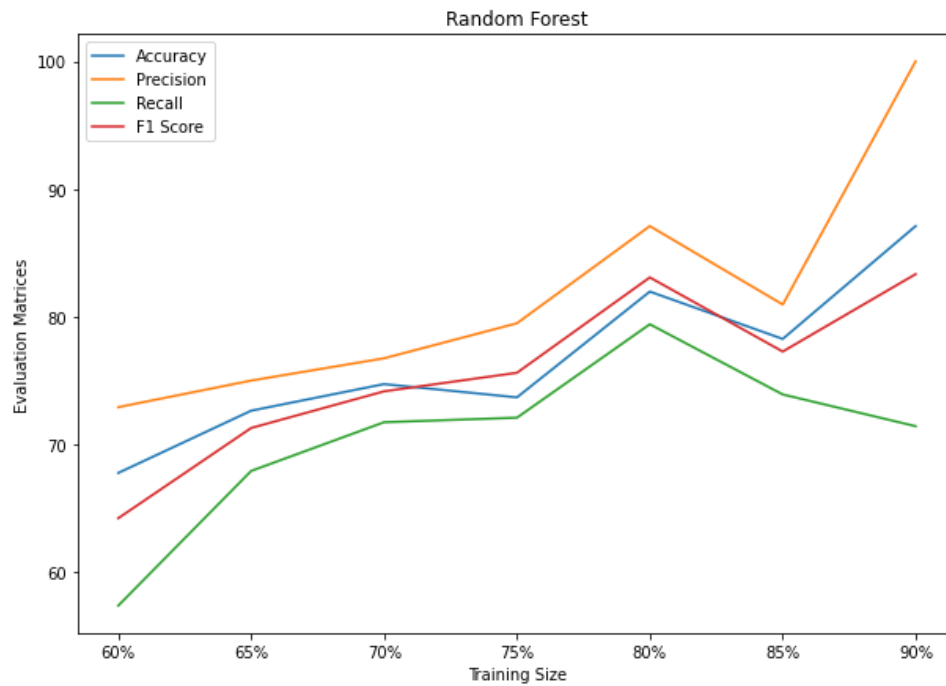| Dataset		Accuracy	Lose	Precision	Recall	F1 Score
Training	Testing					
60%	40%	77.68%	22.31%	77.41%	78.68%	78.04%
65%	35%	78.30%	21.69%	78.84%	77.35%	78.09%
70%	30%	78.02%	21.97%	75.00%	84.78%	79.59%
75%	25%	81.57%	18.42%	83.72%	83.72%	83.72%
80%	20%	83.60%	16.39%	85.29%	85.29%	85.29%
85%	15%	84.78%	15.21%	86.36%	82.60%	84.44%
90%	10%	87.09%	12.90%	85.71%	85.71%	85.71%

Linear SVM vs Kernel SVM:

KNN Model:

Dataset		Accuracy	Lose	Precision	Recall	F1 Score
Training	Testing					
60%	40%	76.03%	23.96%	79.62%	70.49%	74.78%
65%	35%	75.47%	24.52%	76.47%	73.58%	74.99%
70%	30%	75.82%	24.17%	76.08%	76.08%	76.08%
75%	25%	76.31%	23.68%	82.05%	74.41%	78.04%
80%	20%	78.68%	21.31%	83.87%	76.47%	80.00%
85%	15%	80.43%	19.56%	85.00%	73.91%	79.06%
90%	10%	83.87%	16.12%	84.61%	78.57%	81.48%

Decision Tree Model:

Dataset		Accuracy	Lose	Precision	Recall	F1 Score
Training	Testing					
60%	40%	64.46%	35.53%	63.63%	68.85%	66.14%
65%	35%	74.52%	25.47%	77.08%	69.81%	73.26%
70%	30%	70.32%	29.67%	69.38%	73.91%	71.57%
75%	25%	69.73%	30.26%	70.83%	79.06%	74.72%
80%	20%	77.04%	22.95%	79.41%	79.41%	79.41%
85%	15%	69.56%	30.43%	73.68%	60.86%	66.66%
90%	10%	61.29	38.70%	56.25%	64.28%	60.00%

Random Forest Model:

Dataset		Accuracy	Lose	Precision	Recall	F1 Score
Training	Testing					
60%	40%	67.76%	32.23%	72.91%	57.37%	64.22%
65%	35%	72.64%	27.35%	75.00%	67.92%	71.28%
70%	30%	74.72%	25.27%	76.74%	71.73%	74.15%
75%	25%	73.68%	26.31%	79.48%	72.09%	75.60%
80%	20%	81.96%	18.03%	87.09%	79.41%	83.07%
85%	15%	78.26%	21.73%	80.95%	73.91%	77.27%
90%	10%	87.09%	12.90%	100.00%	71.42%	83.33%

Models Evaluation: