Step 5: Model Performance Reports

Gradient Boosting Model:

```
Best n_estimators: 200 with accuracy: 79.38%
Classification Report for the best model:
                 precision    recall  f1-score   support

  baseball_pitch      0.70      0.55      0.61        42
  baseball_swing      0.72      0.88      0.79        43
    bench_press       0.93      0.77      0.84        35
           bowl       0.85      0.93      0.89        55
  clean_and_jerk      0.94      0.73      0.82        22
     golf_swing       0.70      0.71      0.71        42
      jump_rope       0.94      0.75      0.83        20
   jumping_jacks      0.81      0.79      0.80        28
         pullup       0.88      0.90      0.89        50
         pushup       0.89      0.89      0.89        53
          situp       0.92      0.88      0.90        25
          squat       0.87      0.81      0.84        58
    strum_guitar      0.96      1.00      0.98        23
 tennis_forehand      0.59      0.62      0.60        39
    tennis_serve      0.56      0.68      0.62        47

       accuracy                          0.79       582
      macro avg       0.82      0.79      0.80       582
   weighted avg       0.80      0.79      0.79       582
```

Random Forest Model:

```
Best n_estimators: 1350 with accuracy: 83.16%
Classification Report for the best model:
                 precision    recall  f1-score   support

  baseball_pitch      0.75      0.57      0.65        42
  baseball_swing      0.73      0.86      0.79        43
    bench_press       0.97      0.89      0.93        35
           bowl       0.91      0.93      0.92        55
  clean_and_jerk      0.95      0.82      0.88        22
     golf_swing       0.76      0.76      0.76        42
      jump_rope       0.83      0.75      0.79        20
   jumping_jacks      0.79      0.93      0.85        28
         pullup       0.96      0.94      0.95        50
         pushup       1.00      0.98      0.99        53
          situp       0.96      0.92      0.94        25
          squat       0.88      0.90      0.89        58
    strum_guitar      0.96      0.96      0.96        23
 tennis_forehand      0.59      0.56      0.58        39
    tennis_serve      0.58      0.68      0.63        47

       accuracy                          0.83       582
      macro avg       0.84      0.83      0.83       582
   weighted avg       0.84      0.83      0.83       582
```
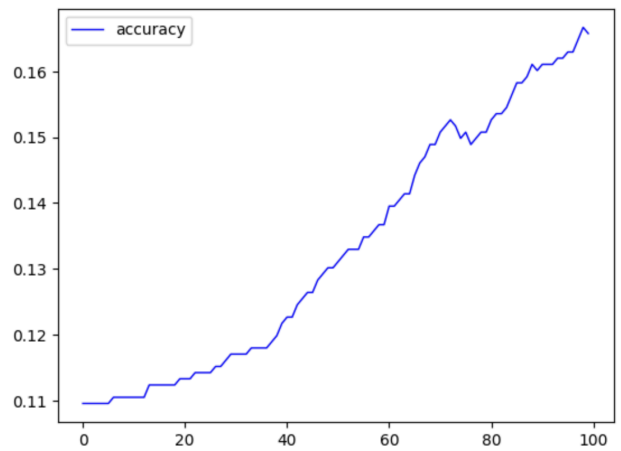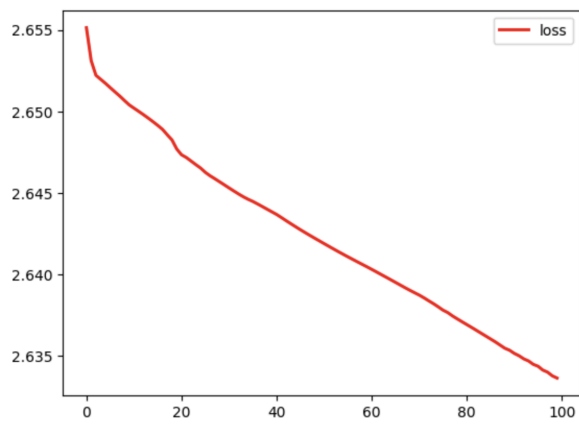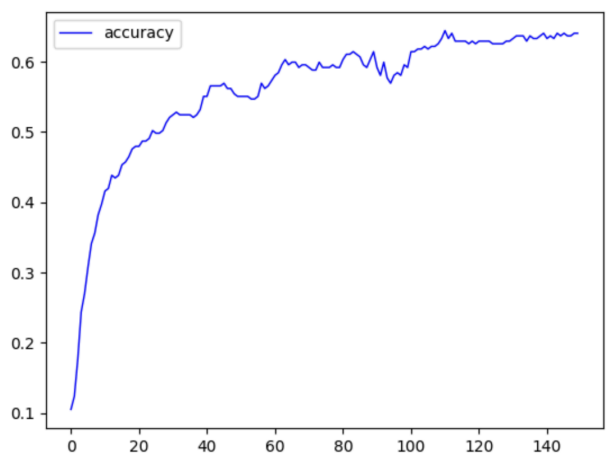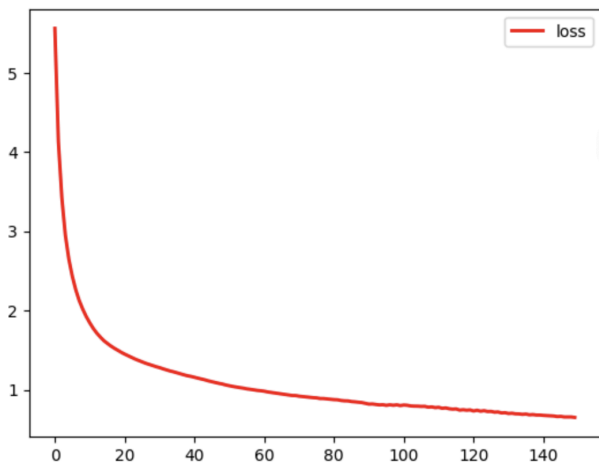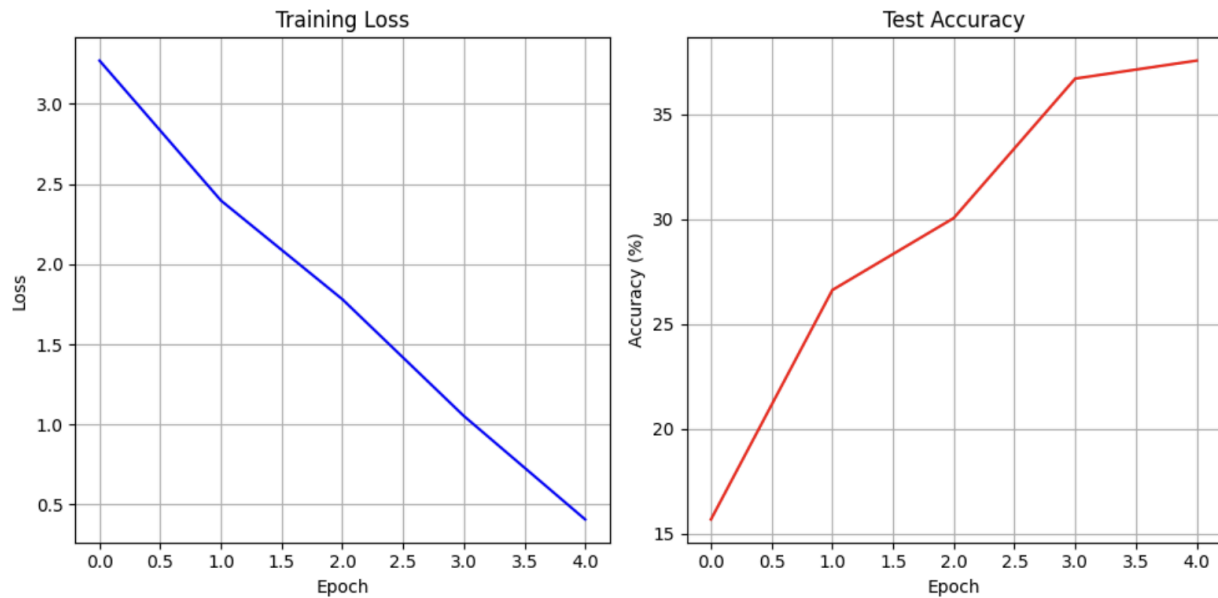
Graph Neural Network:
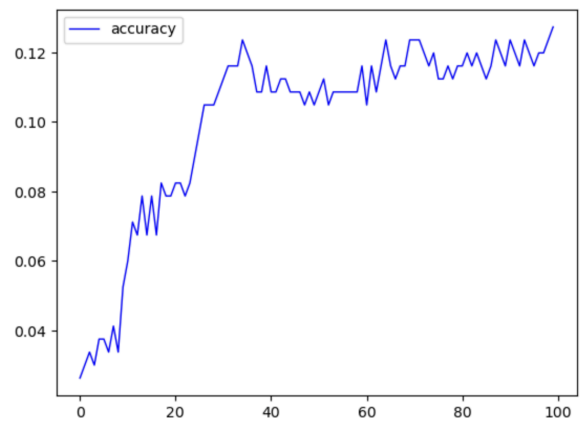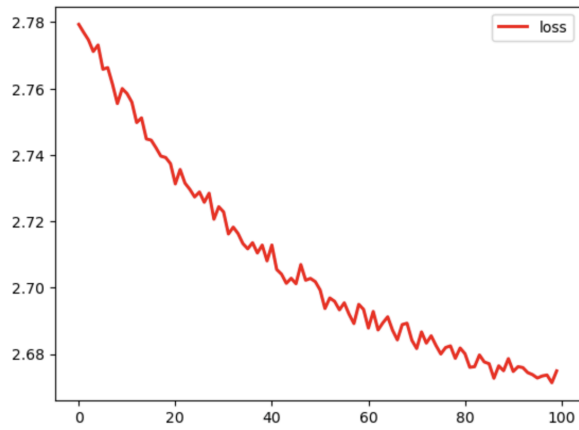
Linear Neural Network (Our Initial Model):

CNN using joint annotatios:

CNN using raw images:

KNN:

	precision	recall	f1-score	support
baseball_pitch	0.30	0.21	0.25	42
baseball_swing	0.50	0.65	0.57	43
bench_press	0.89	0.71	0.79	35
bowl	0.75	0.85	0.80	55
clean_and_jerk	0.65	0.59	0.62	22
golf_swing	0.42	0.64	0.51	42
jump_rope	0.48	0.60	0.53	20
jumping_jacks	0.50	0.79	0.61	28
pullup	0.89	0.84	0.87	50
pushup	0.88	0.79	0.83	53
situp	0.95	0.80	0.87	25
squat	0.91	0.69	0.78	58
strum_guitar	0.88	0.91	0.89	23
tennis_forehand	0.37	0.26	0.30	39
tennis_serve	0.56	0.49	0.52	47
accuracy			0.65	582
macro avg	0.66	0.66	0.65	582
weighted avg	0.67	0.65	0.65	582