Name: Dang Pham

Question 1:

We can use voice features to detect Parkinson's disease because according to Max A. Little et al, Parkinson patients usually have vocal symptoms. Those symptoms are impairment in the normal production of vocal sounds (Such as reduced loudness, breathiness, roughness, and exaggerated vocal tremor), and problems with the normal articulation of speech (dysarthria).

Question 2:

Some features were extracted by performing traditional voice measures like calculations on several features of human voices such as amplitude or frequency. Many of the features were extracted using the Kay Pentax multidimensional voice program, such as MDVP:Jitter(%), MDVP:Jitter(Abs), MDVP:RAP, MDVP:PPQ (Measures of variation in fundamental frequency), or MDVP:Shimmer and MDVP:Shimmer(dB) (Measures of variation in voice amplitude.)

Besides that, some other features were extracted using calculation of nonstandard measures, such as the recurrence period density entropy (RPDE), detrended fluctuation analysis (DFA) or the correlation dimension (D2).

Finally, the authors also introduced a new measure (Feature) that they discovered: pitch period entropy (PPE).

Question 3:

	Accuracy (%)		
Cross-validation (CV)	**GDA**	**LDA**	**QDA**
1	84.21	84.21	84.21
2	89.47	89.47	84.21
3	68.42	68.42	78.94
4	94.73	94.73	94.73
5	89.47	89.47	89.47
6	84.21	84.21	100
7	73.68	73.68	68.42
8	73.68	73.68	78.94
9	84.21	84.21	94.74
10	87.50	87.50	91.67
Average	82.96	82.96	86.53

	Balanced accuracy (%)		
Cross-validation (CV)	**GDA**	**LDA**	**QDA**
1	79.48	79.48	79.48
2	94.44	94.44	69.11
3	64.20	64.20	71.15
4	96.87	96.87	96.87
5	80	80	80
6	84.52	84.52	100
7	70.23	70.23	69.44
8	67.30	67.30	72.85
9	77.08	77.08	90
10	82.77	82.77	95
Average	79.69	79.69	82.39

How to run the code:

I copied the data (Features and labels) into a data.txt file. To run the code, place the MATLAB code (PA1.m) and the data.txt file in the same folder. Open and redirect MATLAB into that folder. Run the code (PA1.m) using MATLAB.