

# Implementation of Feed Forward Neural Network Architecture

**Objective:** Implementation of Neural Network from **scratch** to predict release year of songs

- Used only Numpy & Pandas Library
- Implemented Back Propagation algorithm to train the data
- Used ReLU activation function & Mini Batch gradient Descent algorithm to optimize the loss
- Used hyper parameter tuning to get better accuracy.

**Data Set Link:** <https://www.kaggle.com/c/cs725-autumn-2020-programming-assignment-2/data>

## Result of hyper parameter tuning

Learning Rate	No. of hidden layers	Size of each hidden layer	$\hat{\lambda}$ (regulariser)	RMSE(train)	RMSE(dev)
0.001	1	64	0	10.65046	10.49318
0.001	1	64	5	1427.44086	1427.49643
0.001	1	128	0	10.65858	10.50428
0.001	1	128	5	1427.44086	1427.49643
0.001	2	64	0	10.92554	10.72675
0.001	2	64	5	1427.44086	1427.49643
0.001	2	128	0	nan	nan
0.001	2	128	5	nan	nan
0.01	1	64	0	10.92554	10.72675
0.01	1	64	5	1427.44086	1427.49643
0.01	1	128	0	10.92554	10.72675
0.01	1	128	5	1427.44086	1427.49643
0.01	2	64	0	nan	nan
0.01	2	64	5	nan	nan
0.01	2	128	0	nan	nan
0.01	2	128	5	nan	nan

## Summary:

- Implemented **NN architecture** using **Numpy** and **Pandas** library and trained using **Back Propagation** Algorithm
- Used **ReLU** activation function & **Mini Batch Gradient Descent** along with **hyper parameter** tuning