**ABOUT DATASET**

The **Student Depression Dataset** contains 27,901 entries with 18 features, capturing demographic, academic, lifestyle, and mental health-related information of students. Key attributes include gender, age, academic and work pressure, CGPA, sleep duration, dietary habits, financial stress, and whether the student has had suicidal thoughts or a family history of mental illness. The target variable is Depression, a binary value indicating the presence or absence of depressive symptoms. The dataset includes a mix of numerical and categorical data, requiring preprocessing steps such as encoding and normalization. With its diverse and relevant features, this dataset is well-suited for building predictive models using neural networks to identify students at risk of depression.

The Student Depression Dataset, consisting of 27,901 entries and 18 features, is well-structured for building a neural network to predict depression. **The input layer** would include key features such as gender, age, academic and work pressure, CGPA, study and job satisfaction, sleep duration, dietary habits, degree, suicidal thoughts, financial stress, and family mental health history—after appropriate encoding and normalization. **For the hidden layers**, a simple yet effective architecture might start with a first hidden layer of 32 neurons and a second hidden layer of 16 neurons, both using the ReLU activation function to introduce non-linearity. **The output layer** would consist of a single neuron with a Sigmoid activation function to classify whether a student is likely to be depressed or not. This structure allows the model to learn complex relationships within the data and output a probability indicating the presence of depression.

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| Model Type | LOSS | ACCURACY |
| Basic ANN | 0.5319 | 0.8274 |
| ANN with Adam | 0.5705 | 0.8274 |
| ANN with genetic algorithm | 3.0900 | 0.7403 |
| ANN with Batch Normalization | 0.7205 | 0.8425 |
| Deep ANN (DNN) | 3.7604 | 0.8341 |
| Nadam Optimizer: | 0.0858 | 0.9567 |
| Custom version of Nadam | 0.0688 | 0.9700 |
| Final Nadam(randomness decreased) | 0.0964 | 0.9600 |

BASIC ANN:

<https://colab.research.google.com/drive/1WhtU8ReNnt9dS_EqnbDno5dp0bV83lgZ?usp=sharing>

ANN with Adam:

<https://colab.research.google.com/drive/1Rk6zgFmEcTX33Lyggz5Z0NIHhgjgyMLb?usp=sharing>

ANN with genetic algorithm:

<https://colab.research.google.com/drive/1x-eXHoE9pZMz5jywXQlIueu9hggDycp3?usp=sharing>

ANN with Batch Normalization:

<https://colab.research.google.com/drive/1wxC7Ju53R7g3gLKgLfQao2IKWoruuGHY?usp=sharing>

Deep ANN (DNN):

<https://colab.research.google.com/drive/1F9QOWULxk5g0_wvTXBQUc9Y-EsMbtanz?usp=sharing>

Nadam optimizer:

<https://colab.research.google.com/drive/1MllbfG3yxnVvHtnuS8FvSnQYo_Bn4ZWo?usp=sharing>

final Nadam optimizer:

<https://colab.research.google.com/drive/1IgJtTE0s_a0GIzE6SrDKqpvXqkpX_rWg?usp=sharing>