# Project Proposal – Group 2

Our project examines the image classification capabilities of neural networks by attempting to create an algorithm that will classify 4 different simple shapes (square, rectangle, circle, triangle). Our idea behind selecting this problem is to create a fully automated activity for children to learn how to draw and identify different shapes. In the COVID-19 pandemic, we have seen how difficult it is for parents to both entertain their children while working from home and to ensure their children are getting the education they would normally get. Our solution will provide a first cut solution to keep children occupied and learning at the same time.

Our data will be self-generated. We will create shapes with Adobe Illustrator and with Python tools (such as patches in MatPlotLib) to create these shapes. In addition, we will add noise to the shapes so the algorithm will be able to detect imperfect shapes. These images will be at a low pixel number (~ 50 X 50) to allow for the machine learning algorithms to be processed quickly.

As the type of neural network, we will be using a multi-layer perceptron. We will do experimentation around how many hidden layers and the number of neurons in each layer that will give us the best test results. We are unsure if we will use other algorithms, but we will focus on the MLP. As a result, scikit-learn will be our software of choice. We expect to use the MLPClassifier() package to run our neural network

To judge the performance of our network, we will chiefly be looking at the accuracy scores of applying our test set to the model. Other measures, such as confusion matrices, may be taken into account as well. We expect to complete this project by June 30th, 2020.