In this project, I have created a Spiking Neural Network (SNN) model specifically for image classification tasks, with a focus on leveraging spiking neuron layers to exploit temporal dynamics for enhanced pattern recognition. The key components of the model is a spiking neuron layer module, input encoder, and output decoder. The spiking neuron layer module will simulate neuron spiking behavior, incorporating membrane capacity and spike generation based on threshold mechanisms. Additionally, I will develop an input encoder to convert raw image data into spike sequences suit- able for processing by the SNN, along with an output decoder to utilise the spike patterns into a format comparable to traditional neural network outputs. A comprehensive analysis will be conducted on the complexities involved in SNN models, including challenges in training, compu- tational overheads, and hardware limitations, providing insights into scalability and applicability. The developed SNN model will be evaluated through image classification tasks, involving train- ing on image datasets, parameter tuning, and assessing accuracy and efficiency. Furthermore, a comparative analysis will be conducted between the performance of the SNN model and a conven- tional Convolution Neural Network (CNN) model, focusing on accuracy, computational efficiency, and resource utilization, to highlight potential advantages of SNNs over traditional neural network approaches for image classification tasks.