Title: Write a python program using perceptron neural network to recognise even and odd numbers. Given numbers are in ASCII from 0 to 9.

Outcome: The program will show whether the number is odd or even.

Software and Hardware Requirements:

- Python 3.0
- NumPy library
- Text Editor or Integrated Development Environment

Theory:

A perceptron is one of the simplest types of artificial neural networks. It's a binary classifier that makes predictions based on a linear combination of input features, followed by a thresholding operation.

In this program, we represent each digit from 0 to 9 in its ASCII form as a binary vector. Each element of the vector corresponds to a pixel in a 2D representation of the digit, with 1 indicating an "on" pixel and 0 indicating an "off" pixel.

For training, we provide examples of the ASCII representation of even and odd digits, labelled accordingly. The perceptron learns to find a linear decision boundary that separates even and odd representations in the feature space.

During testing, we convert the ASCII representation of the test number into a binary vector and use the trained perceptron to predict whether it's even or odd.

This simple perceptron demonstrates the basic principles of pattern recognition and binary classification, laying the groundwork for more complex neural network architectures.

Conclusion:

In conclusion, we've developed a Python program using a perceptron neural network to recognize even and odd numbers represented in ASCII form. The program demonstrates the fundamental concepts of binary classification and pattern recognition using a simple neural network architecture.