**Question 1**

Describe the use of Machine Learning, if any, in the following computer systems, clearly identifying and explaining whether it is supervised, unsupervised, semi-supervised, reinforcement learning or a combination of two or more of them:

1. A coin classification system for a vending machine based on exact coin specifications from the U.S. Mint. The vending machine uses a statistical model of the size, weight, and denomination to classify coins.

No learning - Since the machine is not learning from the data. It is using the algorithms to identify the coins. Supervised learning – Since the machine is getting labeled coins. That is a training set is given to the machine with the input and output of the data. Reinforcement learning – Since the computer only learns from the rewards that it gets after every time it makes a move.

1. Detection of violence from surveillance camera feeds.

Deep learning -Neural Network.

1. Detection of disease re-emergence based on past observations and present conditions.

Supervised learning.

1. Identifying newer plant diseases based on leaf images.

Deep learning -Neural Network.

1. Strategized Chess-playing by playing repeatedly and adjusting the strategy by penalizing moves that eventually lead to losing.

Reinforcement learning.