Question 1: What is a loss function?

Question 2: On what basis do we decide what loss function to use?

Question 3: Can loss functions be optimized and consequently improve algorithm output? How?

Answer Question 1: A loss function is essentially a mathematical equation that is used to calculate the difference in the performance output of an algorithm from its expected theoretical output.

Answer Question 2: The type of loss function used depends on a variety of factors such as the task/algorithm, the type of data, etc. For example, for regression problems, loss functions such as MSE or MAE may be used, whereas for classification problems, cross-entropy loss may be used. Moreover, in order to handle imbalanced data or for data ranking, loss functions such as focal loss may be used.

Answer Question 3: Loss functions can be optimized by adjusting their parameters or modifying their structure. Hyperparameter tuning techniques like grid search or random search can be used to find the best combination of hyperparameters for the loss function. Additionally, loss functions can be combined or customized to better fit the specific task at hand.