Assignment #4
Gradient Descent

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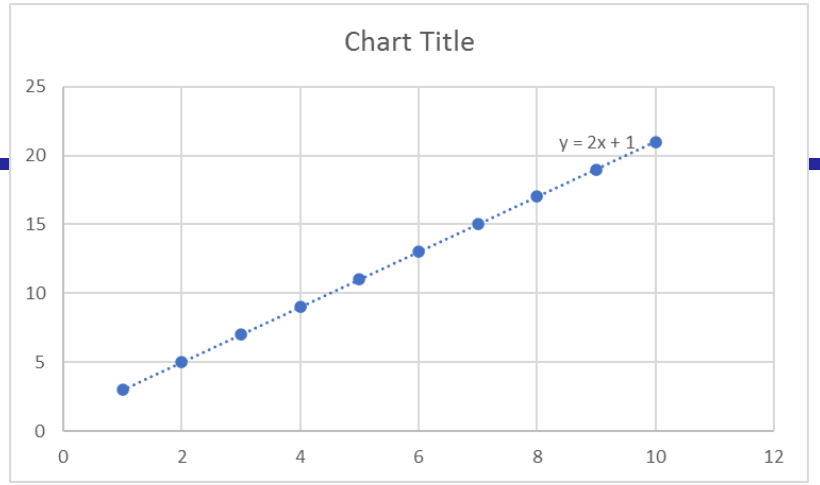
Assignment



- $y_{pred} = w_0 + w_1 x$
  - In a training set:
    - Training Input x = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
    - Labeled Output ***y*** = [3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
- Use gradient descent to find $\boldsymbol{w_0}$ and $\boldsymbol{w_1}$, so that $Error = \frac{1}{10}\sum_{i=1}^{10}\left(y_{pred}(i) - y(i)\right)^2$ is minimal
- $Error = \frac{1}{10}\sum_{i=1}^{10}\left(y_{pred}(i) - y(i)\right)^2 = \frac{1}{10}\sum_{i=1}^{10}\left(w_0 + w_1 x(i) - y(i)\right)^2$
  - ❖ $\frac{\partial Error}{\partial w_0} = \frac{1}{10}\sum_{i=1}^{10} 2\left(w_0 + w_1 x(i) - y(i)\right)$
  - ❖ $\frac{\partial Error}{\partial w_1} = \frac{1}{10}\sum_{i=1}^{10} 2x(i)\left(w_0 + w_1 x(i) - y(i)\right)$
- ❖ Re-Find w0 and w1 when ***y*** = [3, 5, 8, 9, 11, 14, 15, 18, 19, 21]