PT100 Expeiment using Gradient Descent

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***Abstract*—The volatge readings from Voltage divider having PT100 sensor one of the arms is mapped to corresponding temperatue. `numpy.linalg.lstsq` was initially used to fit a linear curve over data. Refer PT100 experiment.**
Now, Gradient Descent method is used to obtain the parameters of linear relation.

1 Cost Function

Here, cost function or error function is defined as mean of squared errors.i.e.

$$Cost(\mathbf{n}) = \frac{1}{m}\sum_{i=1}^{m}(y_i - \hat{y}_i)^2 \tag{1.0.1}$$

$$\tag{1.0.2}$$

where y_i is the actual value and $\hat{y}_i$ is the predicted value and m is the number of data points.
$\mathbf{n}$ is the vector of parameters of linear relation.

$$\mathbf{n} = \begin{pmatrix} A \\ B \end{pmatrix} \tag{1.0.3}$$

The plot of cost function with respect to A and B is shown in figure 0.

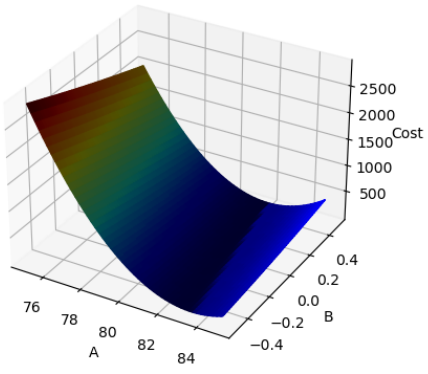

Fig. 0: Cost

`codes/cost.py` contains the code for plotting the cost function.

2 Method

For minimizing the cost function, gradient descent method is used.
Here, the parameters are updated as follows: