Hardware Assignment

AI25BTECH11034 and AI25BTECH11003

1 Training Data

The training data gathered by the PT-100 to train the Arduino is shown in Table 1.

Temperature (°C)	Voltage (V)
40.61	2.27
36.50	2.29
43.00	2.25
36.78	2.29
41.16	2.27
33.00	2.30
37.72	2.28
41.72	2.26
33.77	2.31
34.88	2.30
36.22	2.30
36.94	2.29
38.33	2.29
39.66	2.28
42.22	2.27
32.4	2.30
48.0	2.24
53.8	2.22
76.8	2.14
75.3	2.15
79.6	2.15
73.1	2.16
68.1	2.18
66.5	2.19
63.9	2.20
25.6	2.33

Table 1: Training data

2 Validation Data

The validation dataset is shown in Table 2.

Voltage (V)	Temperature PT (°C)	Temperature (°C)
2.29	35.84	34.2
2.26	42.22	41.5
2.25	46.12	46.1
2.24	47.44	48.5
2.22	52.9	52.7
2.21	55.72	56.3
2.20	60.05	60.4
2.19	63.02	63.1
2.17	69.12	68.5
2.15	73.86	73.4
2.14	78.73	78.3
2.13	83.73	83.4
2.11	88.87	88.0

Table 2: Validation data

3 Error Analysis

The error analysis compares the predicted temperature values with actual measurements from the validation dataset.
Key observations from validation data:

- Maximum absolute error: 1.64

- Mean absolute error: 0.566

- Root mean square error (RMSE): 0.706

4 Result

The model shows good performance with relatively small prediction errors across the temperature range tested.