# HW2

***Question 1: [12p]***

***Connect to your designated Odroid MC1 using Appendix A2.1. Keep the little cluster at 0.2GHz and the big cluster at 2GHz and run TPBench only on core 4 (see Appendix A2.2). Draw as a function of time [s] one plot for each of the following: system (total) power consumption [W], core usage [% utilization] for each big core, and temperature [°C] for each big core.***

Chart

Description automatically generated

Graphical user interface

Description automatically generated with low confidence

Timeline

Description automatically generated

***Question 2: [3p]***

***How many phases of benchmark execution can you identify based on temperature dynamics? A phase is a significant increase in the temperature for an extended period of time.***

From both the core utilization diagram and the core temperature diagram, we can identify four (4) phases of benchmark execution.

***Question 3: [15p] Run the blacksholes and bodytrack benchmarks only on all the big cores (see Appendix A2.2 and A2.3) with a frequency value of 2GHz, while keeping the little cluster at 0.2GHz. For the blackscholes benchmark set the number of threads to 4 to use all 4 big cores (see Appendix A2.3). Draw a plot as a function of time [s] for each of the following: system power [W] and max big temp [°C] (max big temp = max {big core 4 temp, big core 5 temp, big core 6 temp, big core 7 temp}). Complete Table 1:***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Benchmark | Run Time [s] | Avg. Power [W] | Avg. Max Temp. [°C] | Max Temp [°C] | Energy [J] |
| ***Blackscholes*** | 131.90 | 9.36 | 67.79 | 84.00 |  |
| ***Bodytrack*** | 134.65 | 11.61 | 76.80 | 82.00 |  |

Problem 2 [40p]: System Power Prediction

Question 1: [20p] Use SVM to classify the states of the big cluster, namely “cluster active” and “cluster idle”. An active state of the big cluster corresponds to a power consumption larger than 1W, while an idle state corresponds to a power consumption less than 1W. Use all the input features for classification. Train the model on your computer1 on the training\_dataset.csv dataset and then test the models on testing\_blacksholes.csv and testing\_bodytrack.csv datasets. Use the thermal, power, core usage, and frequency data provided in the training\_dataset.csv to train the models. Visualize (i.e., plot) the confusion matrix for the two testing datasets. Compute following performance metrics: accuracy, precision, recall and F1-score. Based on all the performance metrics and the confusion matrix, explain the performance of your classifier. dataset over time [s]. Complete

Table 2.