|  |  |
| --- | --- |
| **Activity No. 1** | |
| **Data Acquisition and Sampling** | |
| **Course Code:** CPE027 | **Program:** |
| **Course Title:** Digital Signal Processing Applications | **Date Performed:** |
| **Section:** | **Date Submitted:** |
| **Name/s:** | **Instructor:** |
| **1. Objective:** | |
| This activity deals with the development of a simple data acquisition system and integrating the various sampling and data capture techniques of analog signals. | |
| **2. Intended Learning Outcomes (ILOs):** | |
| After completion of this activity the students should be able to:  Develop a data acquisition system for a single analog sensor.  Implement various sampling methods (real-time, mean, minima, maxima, mode).  Test the functionality of the system. | |
| **3. Discussion :** | |
| Guide Questions:   1. What are data acquisition systems? 2. What is signal sampling? Describe the process. | |
| **4. Directions:** | |
| 1. Assemble and Fabricate a Sound Capture Circuit using Arduino 2. Implement various sampling algorithms :    1. Real Time Method (100ms interval)    2. Moving Average Method\*    3. Minima – Maxima – Method\*    4. Mode Method\* 3. Array-based methods captures and stores at an array and displays the arrays and the values every 10 samples. 4. Record your results in the results section. | |
| **5. Resources:** | |
| The activity will require the following software, tools and equipment: | |
| **6. Methodology** | |
| *\*Document EVERYTHING you did to accomplish this. Discuss why you did those.* | |
| **7. Data and Results(sample)** | |
| *\*Don’t forget to add a link of your ipynb file, csv, and image results.* | |
| **8. Data Analysis** | |
| ***\*****what did you observe in the data?* | |
| **9. Summary and Conclusions** | |
| *\*summarize what you did. What did you find out?* | |
| **10. Learnings and Contributions of each member** | |
| *\*what did you do to contribute to this activity? What new learnings, methods and techniques did you pick up? Describe in detail.* | |