

Birla Institute of Technology & Science, Pilani, Rajasthan

First Semester 2021-2022

Lab-9 (Python, Online): PCM and DM

Course: EEE F311 Communication Systems

Instructor-in-Charge: S M Zafaruddin

09-11-2021 TUESDAY(P2, P4:): Python

Instructions

- Create a folder named Lab in your shared folder.
- Create a Lab9 Sub-folder in the Lab folder. This folder will be your working directory.
- Develop .py file corresponding to each task.
- You can start the tasks in any order.
- Once all tasks are done, paste your codes and plots/results/observations/conclusions in a word doc and upload through a Dropbox file request link. The link will be shared through Slack.
- Best of Luck

Objectives

In this task, the objective is to study conversion of analog signal to digital.

Python Task 1

N: Sum of the last two digits of your BITS ID.

Convert $m(t) = N \cos(2N\pi t)$ in digital data using PCM encoding techniques. Plot the unquantized and quantized signal in the same plot. Also plot the absolute value of error signal at two different Δ_v .

Python Task 2

N: Sum of the last two digits of your BITS ID.

Convert $m(t) = N \sin(2N\pi t)$ in digital data using DM encoding techniques. Plot the sampled signal and DM signal (approximation signal) in the same plot. Also print the bit-stream. Increase/Decrease Δ to see the nature of approximation signal with respect to the original signal.

Project Task

We have started individual tasks with a bigger picture: to design an end-to-end simulator for a digital communication system. In this task, we have converted analog signal to digital bit-stream.