Task Report:

1.

Semester: Fall 2020

Course code: 432

Course title: Digital Signal Processing Lab

ID: 170103020002

Name: Md. Asif Muntasir

Email: asifmuntasirshuaib@gmail.com

Contact Number: +8801787118444

2. I have answered Task 2. Here I've also answered subtask 1 and 2 from Task 2.

3. My test case is:

1. (-1 to 5)
2. (-3 to 4)
3. (-5 to 5)

Here for test case 3.1 (-1 to 5) the input sequence is [-1 0 1 2 3 4 5] and its Impulse Unit $\delta[n]$ signal is

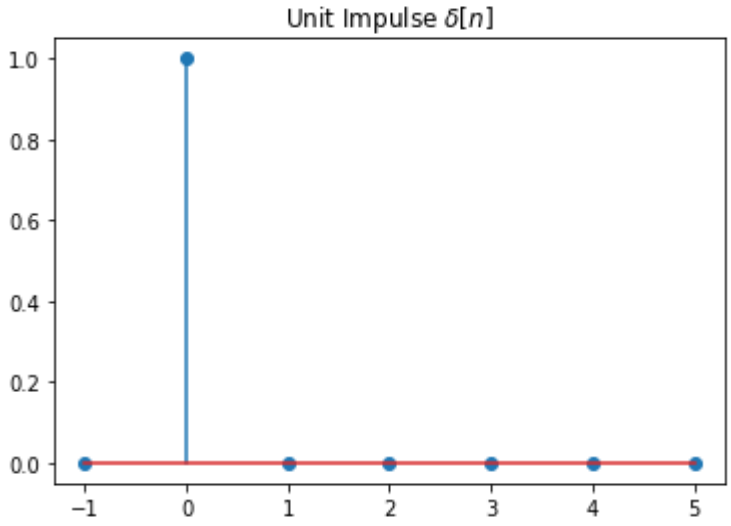

Figure: 1.1 Delta Signal

And its mirroring is in Figure 1.2.

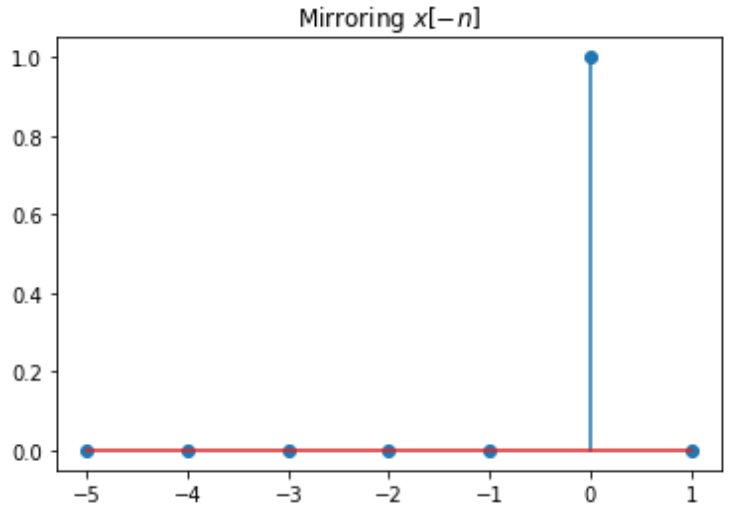

Figure: 1.2 Mirroring

The signal of down sampling for the above impulse signal is in Figure: 1.3.

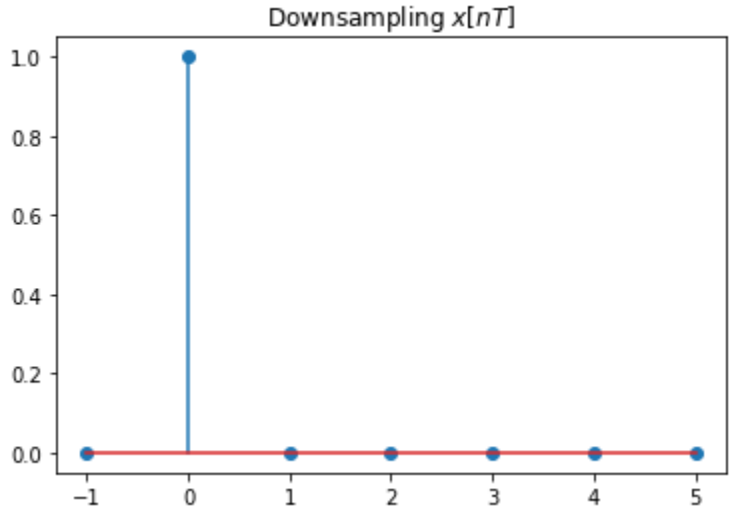

Figure: 1.3 Down Sampling

And the shifting signal is in Figure: 1.4. Note that, here shifting amount = 2.

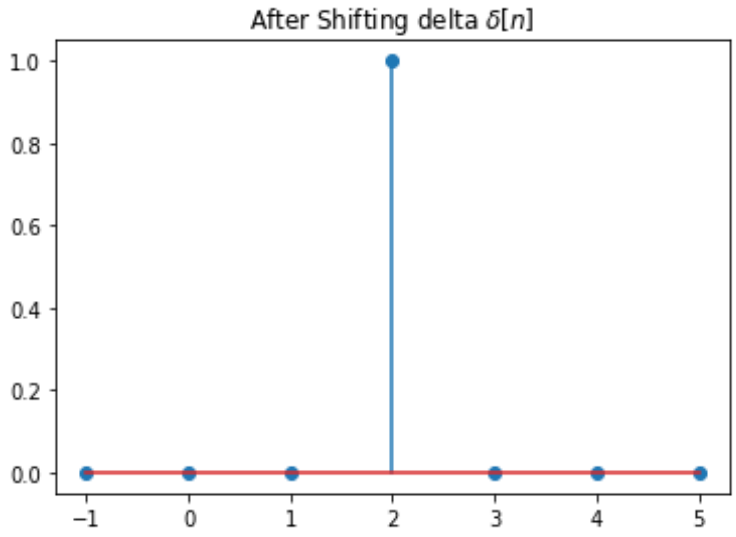

Figure 1.4: Shifting (Shift value = 2)

Now for test case 3.2 (-3 to 4) the input sequence is [-3 -2 -1 0 1 2 3 4] and the Step Unit $u[n]$ signal is in Figure 2.1.

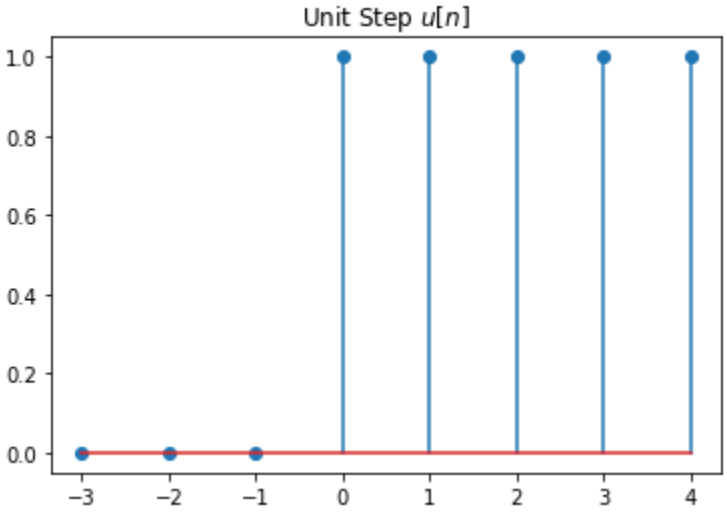

Figure 2.1: Step Unit signal

The shifting signal for this above step unit signal is in Figure 2.2. Note that, here shifting amount = 2.

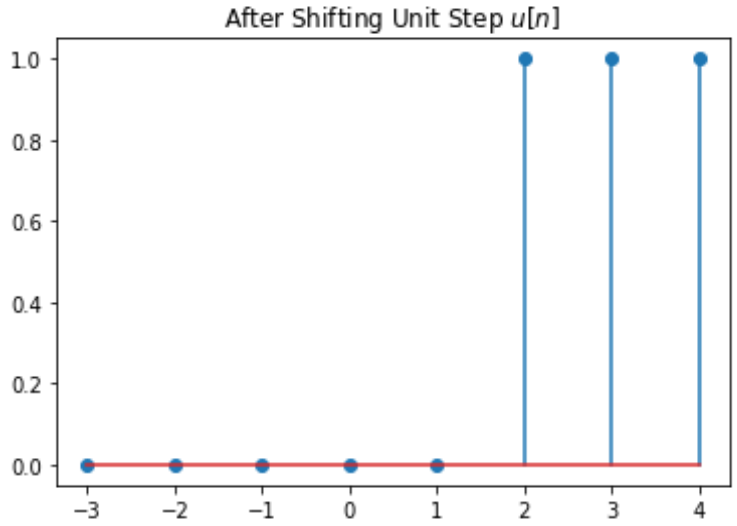

Figure 2.2: Shifting (Shift value = 2)

The mirroring signal for this above step unit signal is in Figure 2.3.

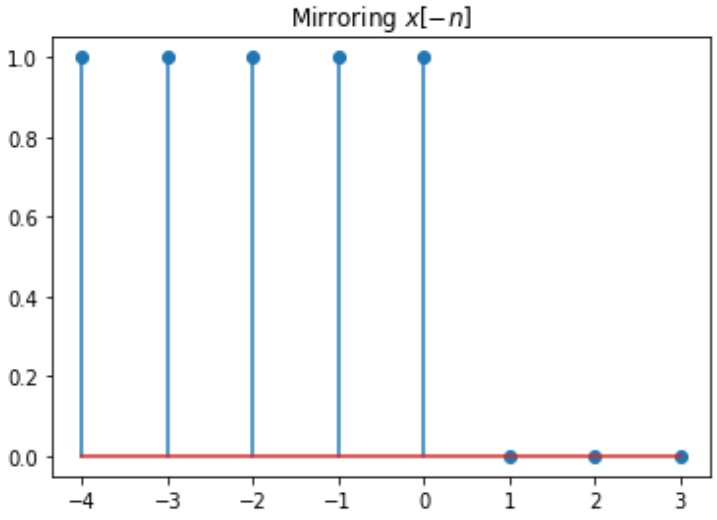

Figure 2.3: Mirroring

The down sampling signal for that step unit signal is in Figure 2.4

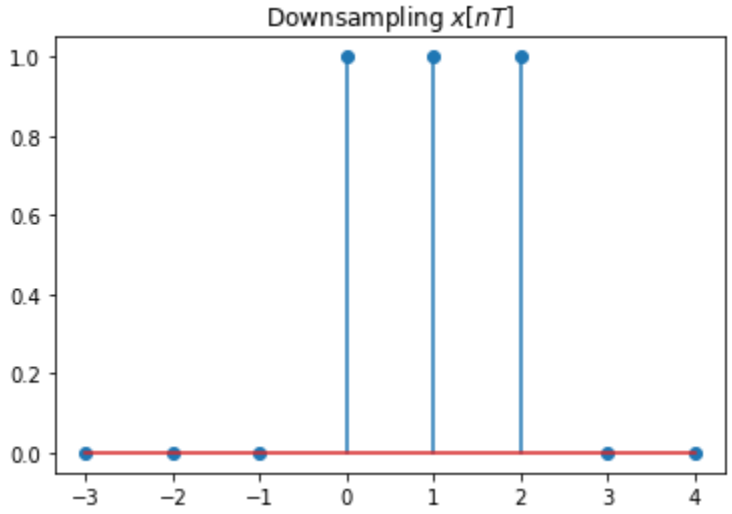

Figure 2.4: Down sampling

My 3rd test case is (-5 to 5) and for this input sequence [-5 -4 -3 -2 -1 0 1 2 3 4 5] and its Unit Ramp $u_r[n]$ signal is in Figure 3.1

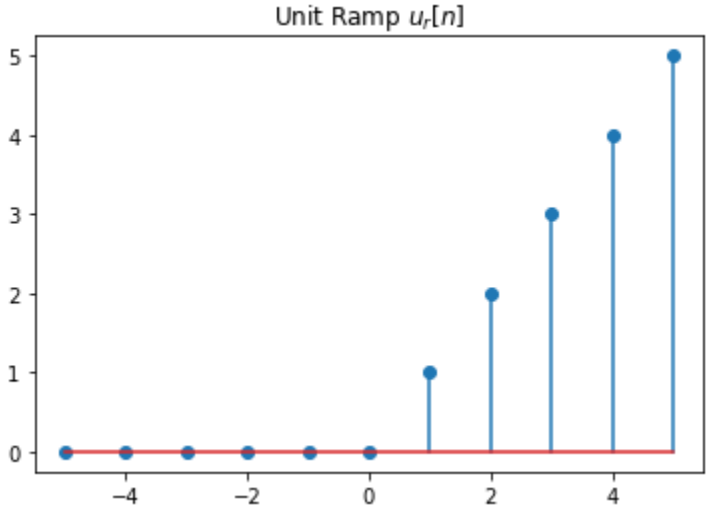

Figure 3.1: Unit Ramp Signal.

Shift signal for this unit ramp signal is in Figure 3.2. note that, here shifting amount = 2.

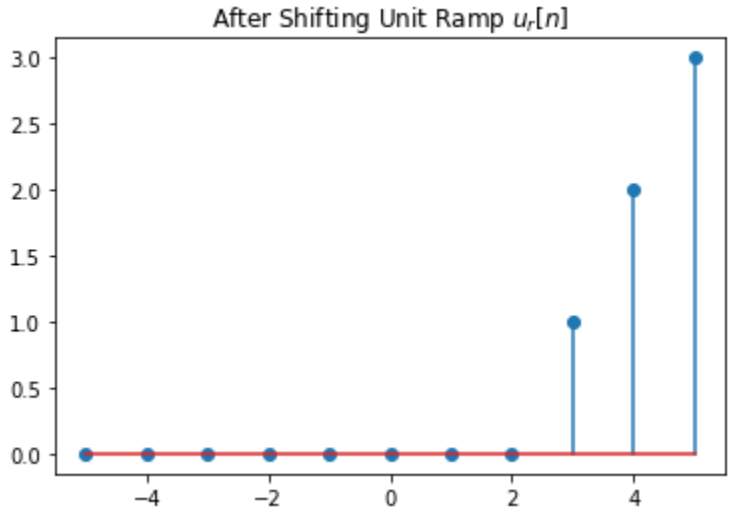

Figure 3.2: Shifting

Mirroring for the above ramp signal is in Figure 3.3

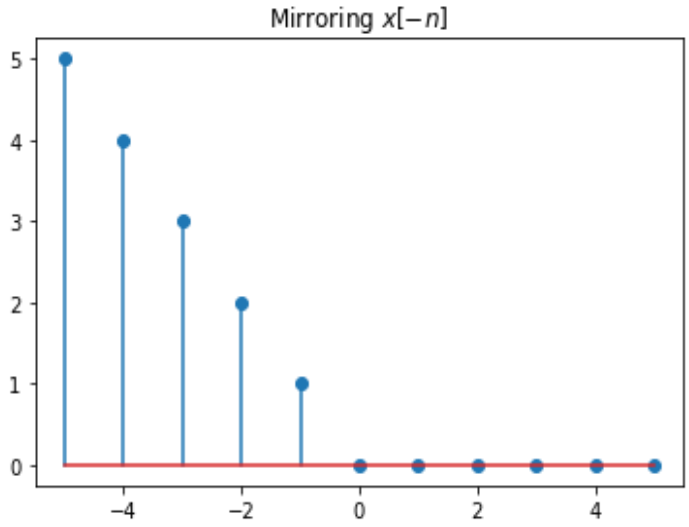

Figure 3.3: Mirroring

Down sampling for the above ramp signal is in Figure 3.4

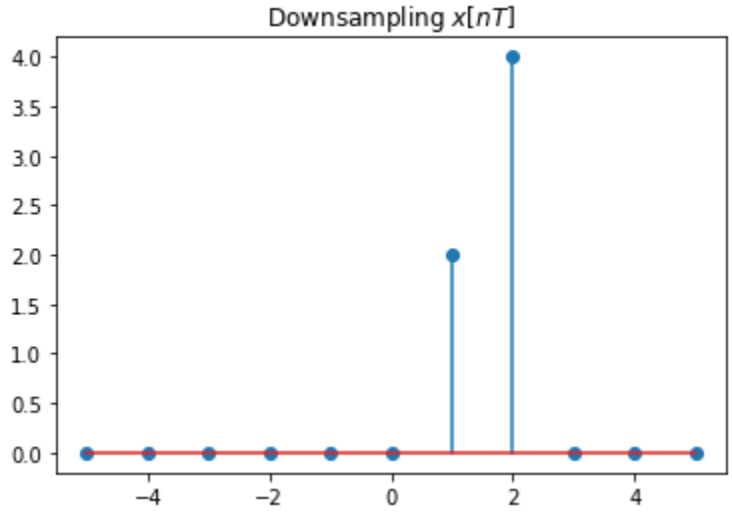

Figure 3.4: Down sampling

Note: For every custom test case here, I have taken down-sampling amount as same as shifting amount and that is 2.

4. Yes. My program produces correct outputs for all test cases that I have tested. But for mirroring we have to need 0^{th} sample. If we have not then it shows an error. Like as if the range is (1 to 5) then it can't be mirroring because here 0^{th} sample are missing. As same as down sampling. The sampling amount T can't be greater than range of input sequence.

5. Yes.

6. No.

7. None.