3) **Programming fun with** 𝑭

**a)** Refer png file **3a\_n\_10.png** under **./Graphs/Q3 path**

Taking arbitrary list of samples  
sample\_list = [2, 56, 24, 67, 8, 24, 72, 24, 10, 45]

**b)** Refer png files with the file pattern **3b\_\*.png** under **./Graphs/Q3 path**

**Observation**:   
As we increase the sample size n, the CDF estimate, i.e., eCDF approaches the true CDF and converges towards becoming a straight line (like the true CDF).

**c)** Refer png file **3c\_n\_5\_m\_5.png** under **./Graphs/Q3 path**

**d)** Refer png files with the file pattern **3d\_\*.png** under **./Graphs/Q3 path**

**Observation**:   
As we increase the number of students, i.e, the number of rows m, the CDF estimate, i.e, eCDF approaches the true CDF and converges towards becoming a straight line (like the true CDF), even though the number of samples n remains constant. Also, since each row m has n samples, it is effectively equivalent of sampling over n\*m samples, which may explain why the eCDF at m=x appears to be sharper than the corresponding graph in 3b) with n=x, where x = {10, 100, 1000}

**e)** Refer png file **3e\_normal\_ci.png** under **./Graphs/Q3 path** for Normal-based CI

**f) -** Refer png file **3e\_kdw\_ci.png** under **./Graphs/Q3 path** For KDW-based CI

- Refer png file **3f\_normal\_kdw\_ci.png** under **./Graphs/Q3 path** For comparison of both normal and DKW-based CIs

**Observation**:

From **3f\_normal\_kdw\_ci.png,** we can see that Normal-based CI is tighter than the DKW-bound one.