Lecture 7: Basic Sampling

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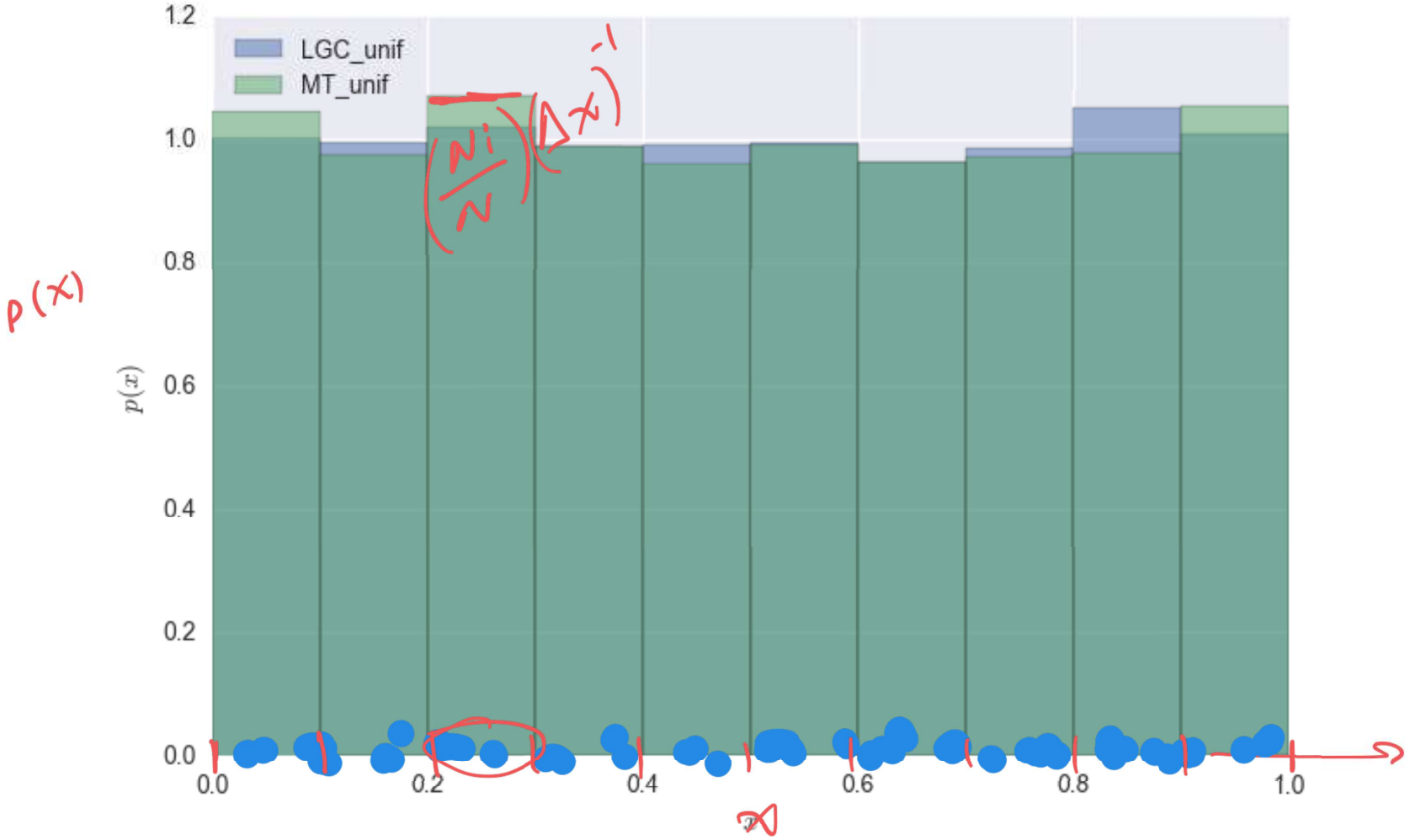
Sampling the uniform

PRNG to uniform

- PRNG's generate random integers from 0 to m.
- How can we get samples from the uniform?
- Step 1: Sample a random integer d.
- Step 2: Set:

$$x = \frac{d}{m}$$

PRNG to Uniform



How do we know that the samples are indeed uniform?

$X \sim U([0,1])$

$F(x) = P[X \leq x] = x$

We can compare the empirical CDF with the ideal CDF.

$\hat{F}_N(x)$ — # samples

But what is the empirical CDF of a bunch of samples $x_{1:N}$?

It is defined as follows:

$$\hat{F}_N(x) = \frac{\text{number of elements in sample } \leq x}{N}$$

How do we know that the samples are indeed uniform?