5.2.6 Exam: Identify the sample mean distribution

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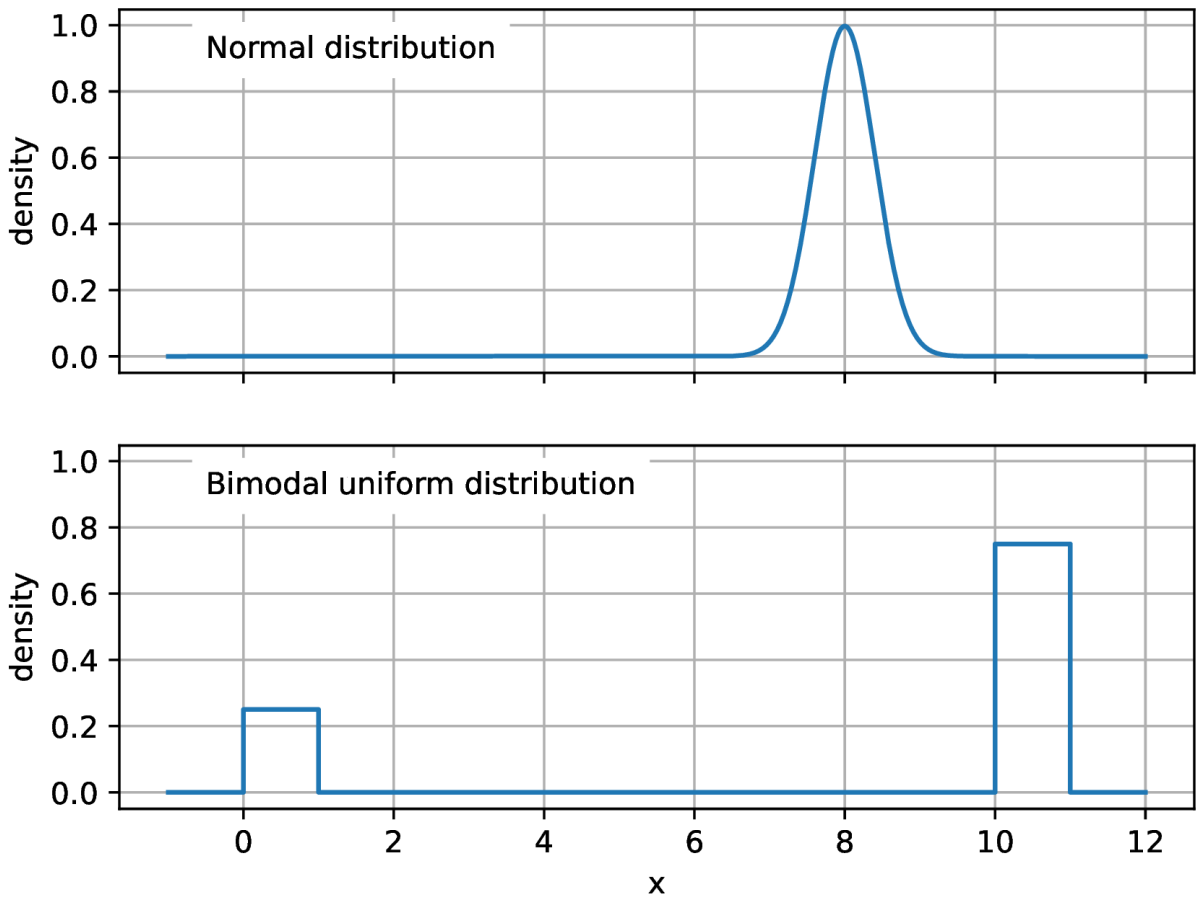
Exams due Sep 27, 2023 05:00 IST Completed

For the questions below, consider the following two probability density functions:

- A normal distribution with expectation $\mu = 8$ and standard deviation $\sigma = 0.4$.
- A bimodal uniform distribution with 25% of the values between $0 < x < 1$ and the other 75% between $10 < x < 11$.

Plots of these densities are shown in the plot below.

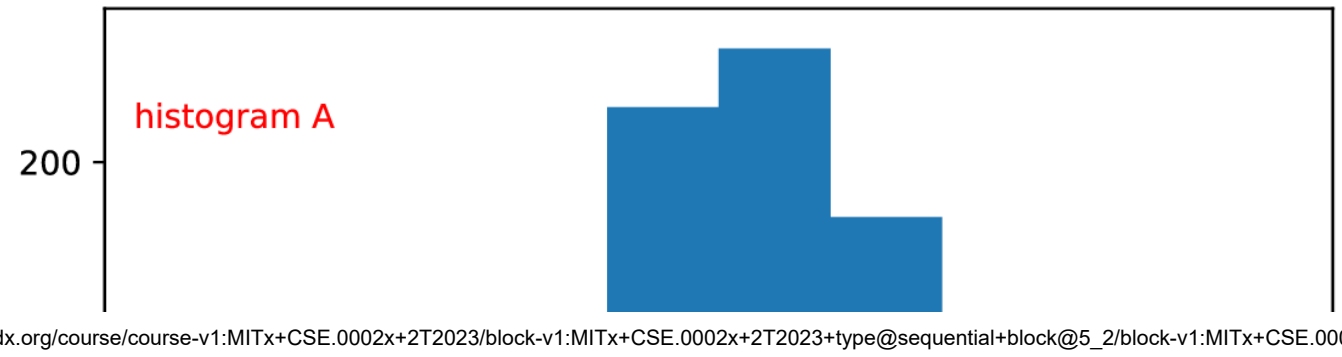


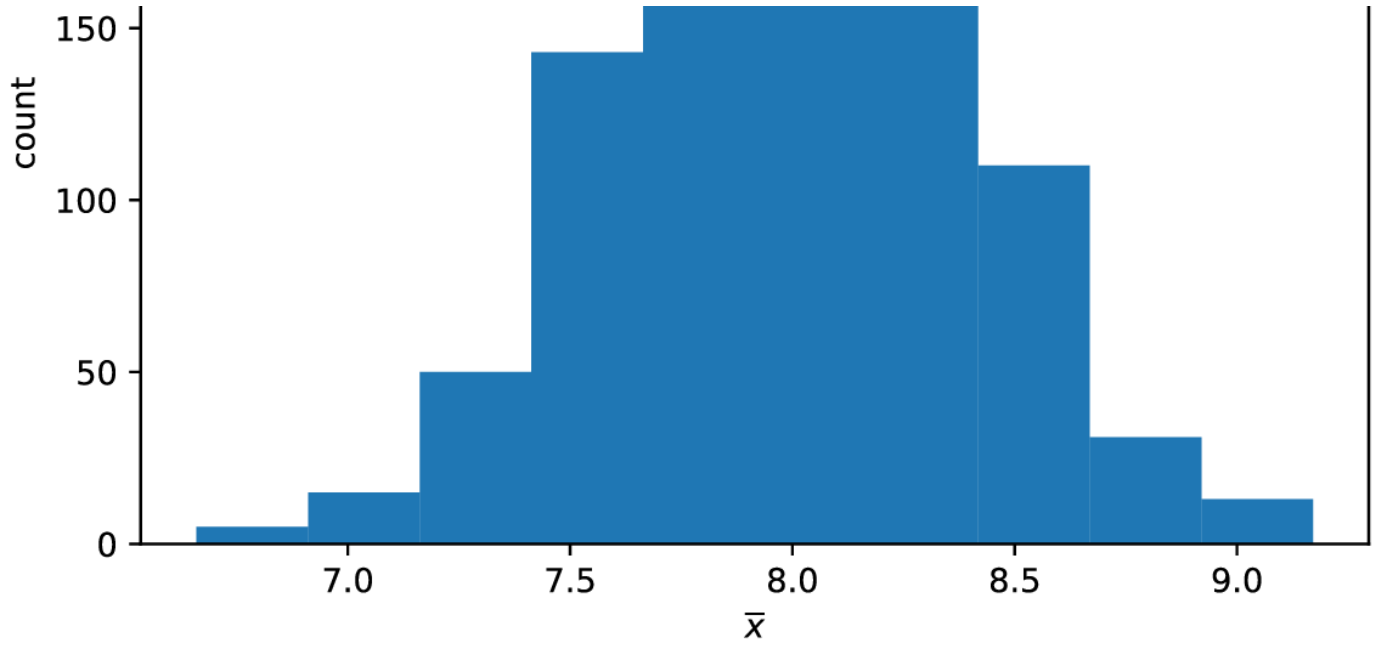
Problem: Sample mean histogram for normal distribution

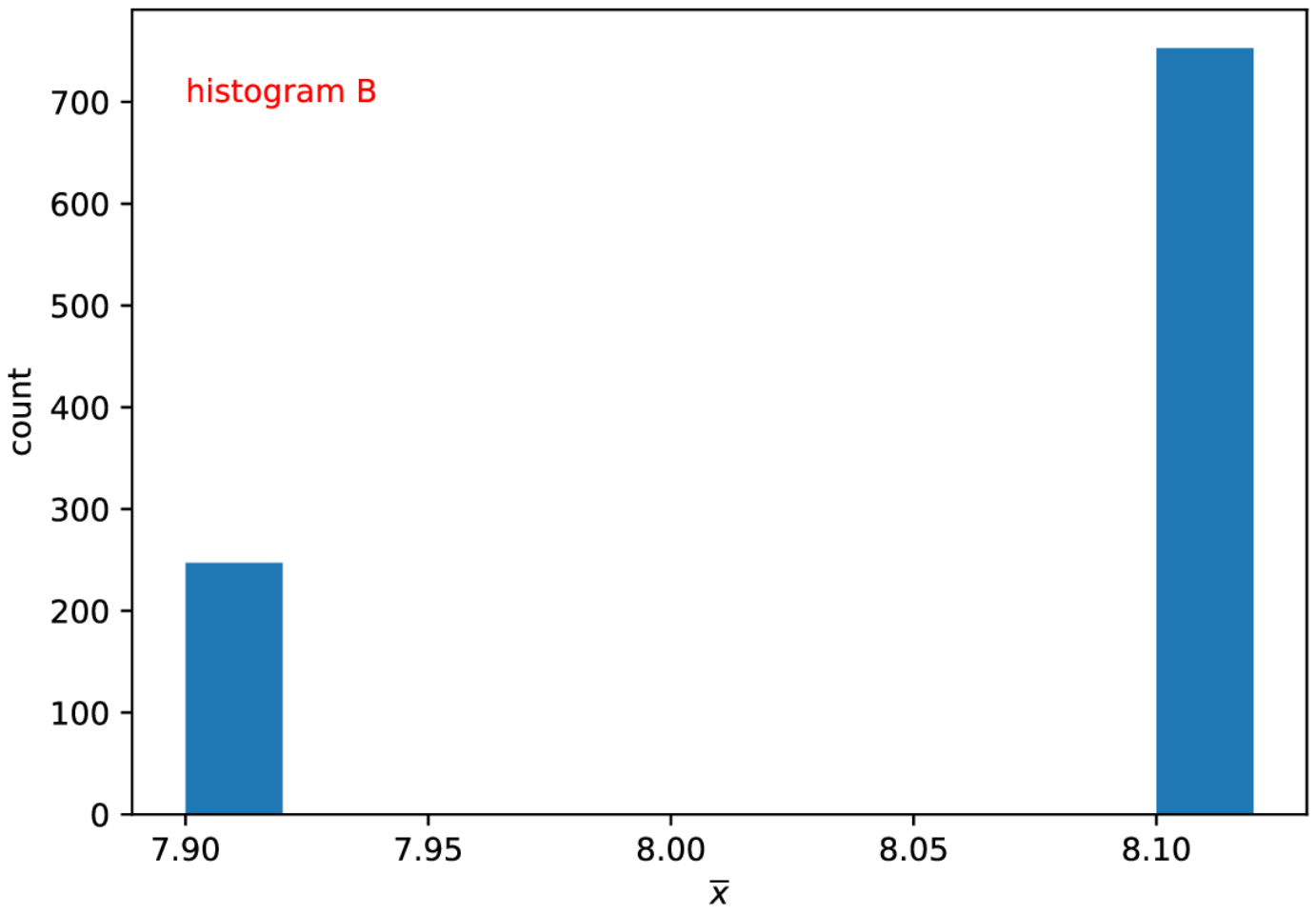
2.0/2.0 points (graded)

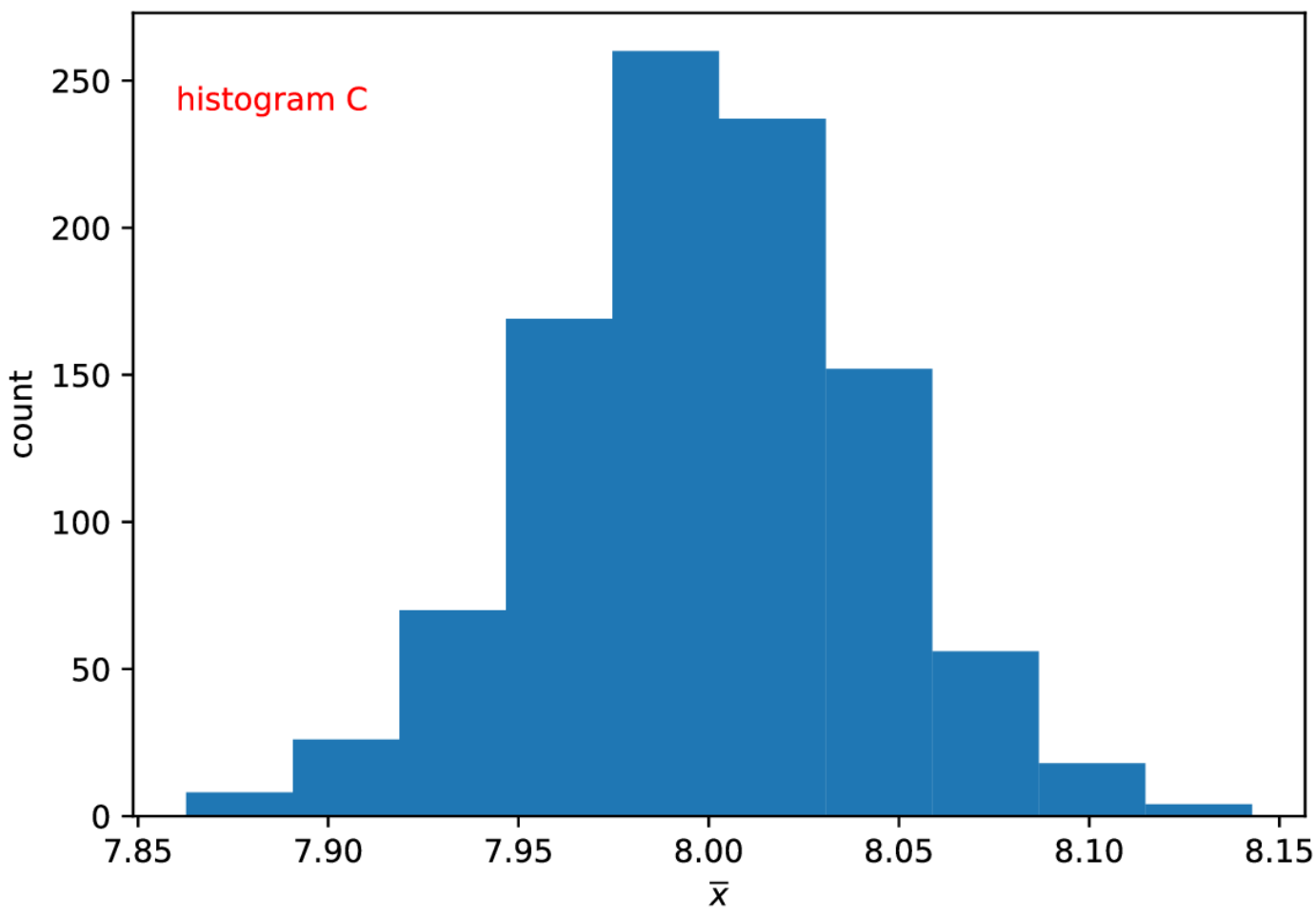
Suppose that this normal distribution is sampled with a sample size $N = 10,000$ and the mean of the sample is calculated. This is done 1,000 times so that there are 1,000 sample means $\bar{x}_i$ for $i = 0$ to 999. Of the following histograms, which would you expect to observe for the distribution of these sample means $\bar{x}_i$?

- histogram A
- histogram B
- histogram C
- histogram D ✔

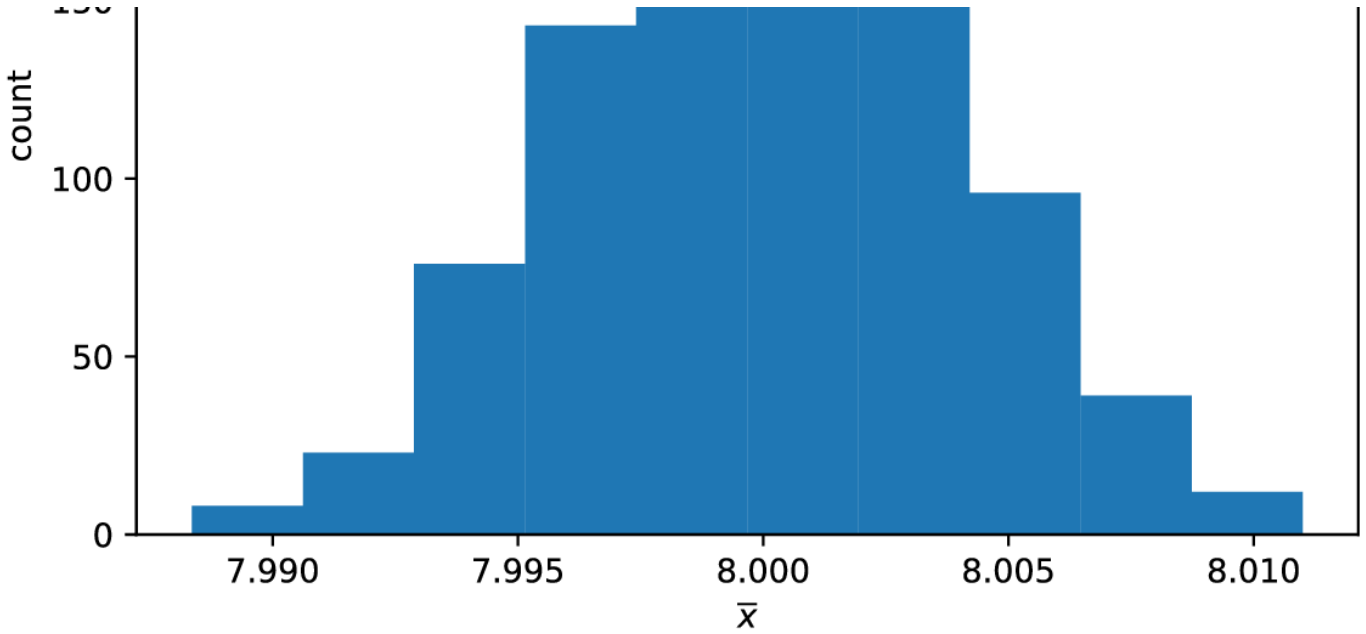



150
100
50
0
count
7.0
7.5
8.0
8.5
9.0
$\overline{x}$


histogram B
700
600
500
400
300
200
100
0
count
7.90
7.95
8.00
8.05
8.10
$\overline{x}$


histogram C
250
200
150
100
50
0
count
7.85
7.90
7.95
8.00
8.05
8.10
8.15
$\overline{x}$

histogram D
200
150



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Answers are displayed within the problem

Problem: Sample mean histogram for bimodal uniform distribution

2.0/2.0 points (graded)

Suppose that this bimodal uniform distribution is sampled in the same manner (with a sample size $N = 10,000$, and 1,000 times so that there are 1,000 sample means $\bar{x}_i$ for $i = 0$ to 999). Selecting from the same histograms above, which would you expect to observe for the distribution of these sample means $\bar{x}_i$?

- histogram A
- histogram B
- histogram C
- histogram D

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Answers are displayed within the problem

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