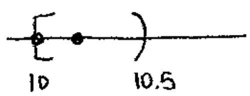
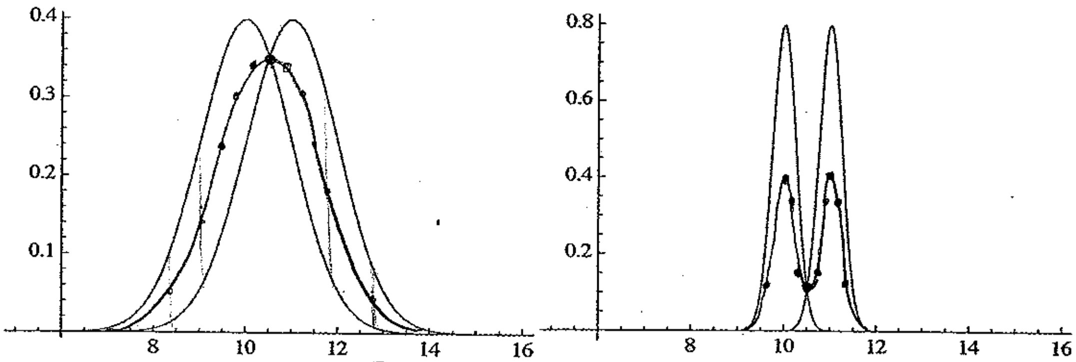
1. Given a list of scores $\{x_i\} = \{10, 9.7, 6.8, 8.8, 10.2, 10.5, 11\}$ determine the height of the probability historgram for the class interval [10, 10.5). Show your method and evaluate (plug in) but do not reduce.



$$\text{height}(h) = \left(\frac{\#\text{in bin}}{\text{total}}\right) \Big/ \text{bin width} = \frac{(2/7)}{(1/2)} = \boxed{\frac{4}{7}}$$

2. Given two data values 10, 11, with bell curves centered on each as shown below, hand plot by hand the function f = average height of the two bell curves. This is the probability density. The one on the right is with samller band-width.



smooth2[{10,11}, 1]

HW 1 KEY

3. For 0-1 scores $\{x_i\}$ the sample mean $\bar{x}$ and sample standard deviation s simplify to

$$\bar{x} = \frac{\Sigma x}{n} = \frac{\text{number of 1 scores}}{n} = \hat{p}$$

$$s = \sqrt{\sum (x - \bar{x})^2 / (n-1)} = \sqrt{\frac{n}{n-1}}\sqrt{\hat{p}(1-\hat{p})}$$

a. Toss a coin n = 25 times, recording the sequence of H, T scoring H = 1 and T = 0.

n=25

H	~~||||~~ ~~||||~~ || (12)
T	~~||||~~ ~~||||~~ ||| (13)

Score = 12

b. From (a) determine

b1. Sample mean $\bar{x} = \hat{p} =$ $12/25 \approx .48$

b2. Sample standard deviation s = $\boxed{\sqrt{\frac{12(1-12/25)^2 + 13(0-12/25)^2}{25-1}}} \approx .5099$

b3. Margin of error $1.96 \frac{s}{\sqrt{n}} =$ $\frac{.5099}{\sqrt{25}}(1.96) \approx .1999$

b4. There is probability of around 0.68 that the population mean 0.5 will be covered by the interval o0btained from your data as

$\bar{x} - 1.0 \frac{s}{\sqrt{n}}$ to $\bar{x} + 1.0 \frac{s}{\sqrt{n}}$

$\frac{12}{25} - 1.0\left(\frac{.5099}{5}\right) \approx .3780$ | $\frac{12}{25} + 1.0\left(\frac{.5099}{5}\right) \approx .5820$

Determine this interval and say whether your interval has indeed covered the true population mean of 0.5.

Yes, the population mean, μ, does fall within the interval,

$.3780 < \mu < .5820$

b5. Around 68% of class members should answer yes to b4. What percentage of the class answered yes?

16 covered
7 not

$\frac{16}{(16+7)} * 100 \approx 69.6\%$ answered yes