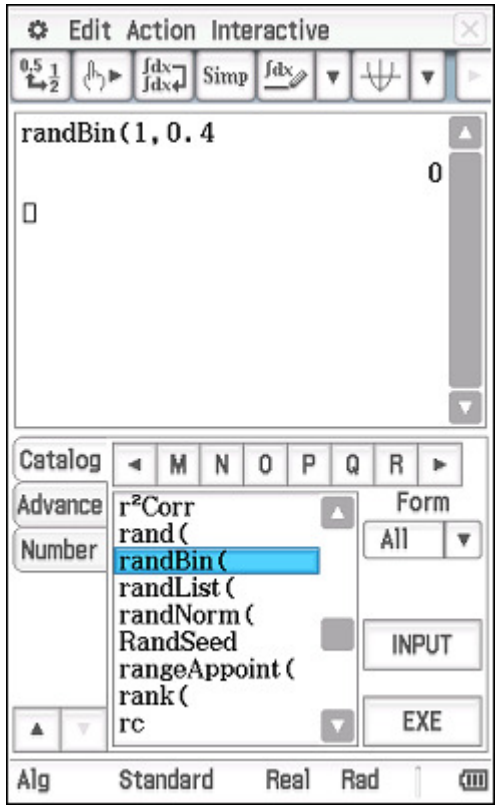
ClassPad II Help Series	The Tuition Centre, Claremont, WA	www.thetuitioncentre.com.au	Author	Charlie Watson
CP571	Simulating Distribution Of Sample Proportion		Date	June 2016
			CPII OS	02.00.4000.0000

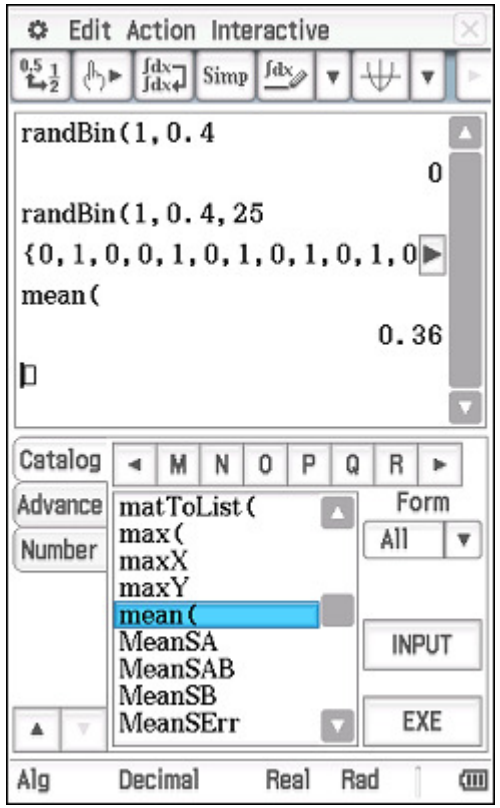
Bernoulli distribution

40% of drivers pass test first time.
0=fail, 1=pass.

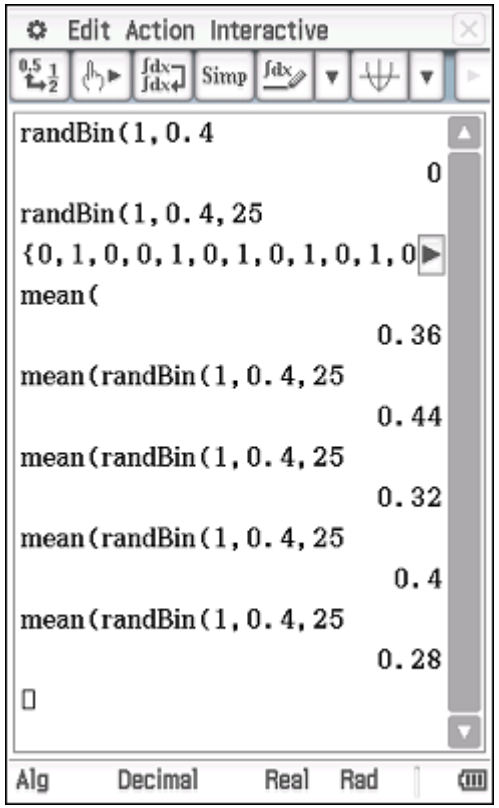
Start with a single simulation in Main using randBin(n,p)



Now try a random sample of 25 drivers using randBin(n,p,N) and use mean to determine the sample proportion.

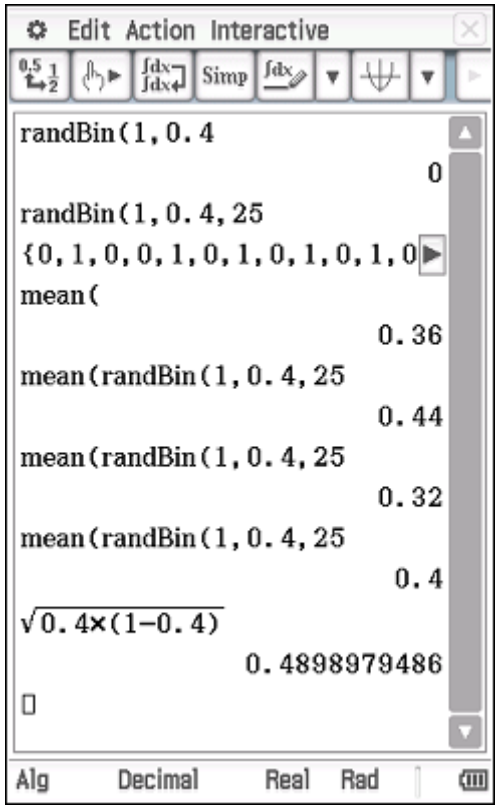


Just tap EXE to repeat simulation.



Recall that mean and standard deviation of a Bernoulli distribution are given by $\bar{x} = p$ and $sd = \sqrt{p(1-p)}$.

In this example $\bar{x} = 0.4$ and $sd \approx 0.49$.



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In Main, take a copy of the line to calculate the sample proportion and then start a new spreadsheet, pasting the formula into cell A1.

Use Edit, Fill, Fill Range to copy the formula into cells A1 to A50.

Put cursor into cell B1 and use Calc, List-Statistics, mean to calculate the mean of the 50 proportions, each based on a random sample of size 25.

Then cursor into B2 and repeat but use stdDev.

Select column A, tap Graph, Histogram.

Tap into the top window and use File, Recalculate to simulate measuring another 50 sample proportions.

You may want to File, Save your spreadsheet.

The histogram mostly resembles a normal distribution and the mean in cell B1 is always close to the known proportion of 0.4.

The standard deviation in cell B2 is always close to $\sqrt{\frac{0.4(1-0.4)}{25}} \approx 0.098$.