New pseudocode:

unc Wv / meas Wv

for Tuesday: Taylor Ch. 5
+ N.R. Ch 14 intro
+ 14.1

One approach

make fract uncWv = uncWv / measWv

fract UncWv $^2$

sum (fract UncWv)

sqrt

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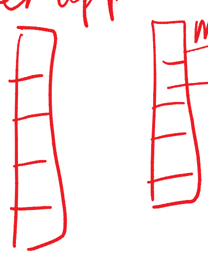
Other approach

unc

meas



$(\text{unc}/\text{meas})^2$

$+ (\text{unc}/\text{meas})^2$

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wave[ ] ⇒ point number (row number)

wave( ) ⇒ x value

set a variable value

condition when to do stuff

increment counter

for( ___ ; ___ ; ___ )

stuff

endfor

Taylor problem 3.22: Student measures

I = 2.10 ± 0.02 amps V = 1.02 ± 0.01 volts

a) What is power with uncertainty? P = IV

b) What is the resistance with? R = V/I

Which answer (power, resistance) has greater fractional uncertainty?

A) Power

B) Resistance

C) Both are the same

$$\frac{\delta P}{P} = \sqrt{\left(\frac{\delta I}{I}\right)^2 + \left(\frac{\delta V}{V}\right)^2}$$

$$\frac{\delta R}{R} = \sqrt{\left(\frac{\delta I}{I}\right)^2 + \left(\frac{\delta V}{V}\right)^2}$$

# wavestats

Monday, September 03, 2012
2:53 PM

**WaveStats** /ALPH=*val* /C=*method* /M=*moment* /Q [/R = (*startX*, *endX* )]/Z *waveName*

The WaveStats operation computes several values associated with the named wave.

***Details***

WaveStats uses a two-pass algorithm to produce more accurate results than obtained by computing the binomial expansions of the third and fourth order moments.

WaveStats returns the statistics in the automatically created variables:

| | |
|---|---|
| V_npnts | Number of points. Doesn't include NaN or INF points. |
| V_numNans | Number of NaNs. |
| V_numINFs | Number of INFs. |
| V_avg | Average of Y values. |
| V_sdev | Standard deviation of Y values, $\sigma = \sqrt{\frac{1}{V\_npnts - 1}\sum(Y_i - V\_avg)^2}$ ("Variance" is V_sdev$^2$.) |
| V_sem | Standard error of the mean $sem = \sigma / \sqrt{V\_numPnts}$ |
| V_rms | RMS of Y values $= \sqrt{\left(\frac{1}{V\_npnts}\sum Y_i^2\right)}$ |
| V_adev | Average deviation $= \frac{1}{V\_npnts}\sum_{i=0}^{V\_npnts-1} \lvert Y_i - \bar{Y} \rvert$ |
| V_skew | Skewness $= \frac{1}{V\_npnts}\sum_{i=0}^{V\_npnts-1}\left[\frac{Y_i - \bar{Y}}{\sigma}\right]^3$ |
| V_kurt | Kurtosis $= \frac{1}{V\_npnts}\sum_{i=0}^{V\_npnts-1}\left[\frac{Y_i - \bar{Y}}{\sigma}\right]^4 - 3$ |

Statistical Parameters from Ch. 4:

| | |
|---|---|
| Mean | V_avg |
| Standard Deviation* | V_sdev |
| Standard Deviation (Error) of the Mean | V_sem |

* *Sample* sdev with 1/(N-1)

Some examples from Taylor (Sect. 4.5):

1. Area of a Rectangle
2. Spring