https://www.prairielearn.org/pl/course_instance/129442/instructor/question/1792364/preview

HW2.9. Python: Indexing & Slicing

Given a numpy array `a` of shape (78, 95, 79).

The shape of

```
a[:-4, 5:, 4:-1]
```

is given by the tuple `(x,y,z)`. Enter the values for x, y and z below.

$x =$ integer

$y =$ integer

$z =$ integer

Save & Grade *Single attempt* | Save only

Additional attempts available with new variants

https://www.prairielearn.org/pl/course_instance/129442/instructor/question/9046900/preview

HW3.3. Absolute/Relative Error Questions

Your friend decided to make you Kool-Aid. The instructions called for 1000 mL of water per packet of mixture. Your friend had only an unmarked cup that fits 560 ml of water. Since she did not want to risk diluting your drink, she used exactly 1 of these cups of water. What is the **relative error** associated with using only 1 cup(s) of water?

$error =$ number (rtol=1e-06, atol=1e-08)

Note the expected tolerance that we use to check your answers.

Save & Grade *Single attempt* | Save only

Additional attempts available with new variants

$\hat{x}$ has $\boldsymbol{n}$ **significant figures** of x if $|x - \hat{x}|$ has zeros in the first n decimal places counting from the leftmost nonzero (leading) digit of x, followed by a digit from 0 to 4.

Accurate to *n* significant digits means that you can trust a total of *n* digits. *Accurate digits* is a measure of relative error.

n is the number of accurate significant digits

6×10^{-4}

0.6×10^{-3} → 3 sig figs

Relative error: $error = \frac{|x_{exact} - x_{approx}|}{|x_{exact}|} \leq 5 \times 10^{-n}$

In general, we will use the rule-of-thumb:

$$\boldsymbol{error = \frac{|x_{exact} - x_{approx}|}{|x_{exact}|} \leq 10^{-n+1}}$$

https://www.prairielearn.org/pl/course_instance/129442/instructor/question/9046898/preview

Number of Significant figures/Errors

As a PhD student studying epidemiology, you find that only 2.999999% of people are ever infected by a certain virus. You dislike this number and decided to round it up to 3%. How many significant figures does your rounded number have over the original one?

- (a) 7 figures
- (b) 1 figures
- (c) 6 figures
- (d) 8 figures

Save & Grade | Save only | New variant

https://www.prairielearn.org/pl/course_instance/129442/instructor/question/1902810/preview

Relative Error of a Sum

The measured distance between Champaign and Chicago is 257.6 miles with a relative error of 3%, and the measured distance between Chicago and Milwaukee is 205 miles with a relative error of 9%

The distance between Champaign to Milwaukee can be given by the sumation of both distances. In the worst case, what is the relative error (in percent) of the distance between Champaign to Milwaukee?

max relative error = number (rtol=1e-06, atol=0.01) % ?

Save & Grade | Save only | New variant

https://www.prairielearn.org/pl/course_instance/129442/instructor/question/1902810/preview

Relative Error of a Sum

The measured distance between Champaign and Chicago is 257.6 miles with a relative error of 3%, and the measured distance between Chicago and Milwaukee is 205 miles with a relative error of 9%

The distance between Champaign to Milwaukee can be given by the sumation of both distances. In the worst case, what is the relative error (in percent) of the distance between Champaign to Milwaukee?

max relative error = number (rtol=1e-06, atol=0.01) % ?

Save & Grade | Save only | New variant

Relative Error of a Sum

The measured distance between Champaign and Chicago is 290.8 miles with a relative error of 3%, and the measured distance between Chicago and Milwaukee is 241.8 miles with a relative error of 5%

$e = |d - \hat{d}| / d$

$d = \hat{d} + \Delta d$

The distance between Champaign to Milwaukee can be given by the sumation of both distances. In the worst case, what is the relative error (in percent) of the distance between Champaign to Milwaukee?

$\hat{d}_1 = 290.8$ miles $\quad e_1 = 3/100$

$\hat{d}_2 = 241.8$ miles $\quad e_2 = 5/100$

$d_1 = ?$

$d_2 = ?$

$d = d_1 + d_2$

$e_1 d_1 = |d_1 - \hat{d}_1| \rightarrow e d_1 = d_1 - \hat{d}_1$

$e d_1 - d_1 = -\hat{d}_1$

$-e d_1 + d_1 = \hat{d}_1$

$(1 \pm e) d_1 = \hat{d}_1$

$d_1 = \dfrac{\hat{d}_1}{1 \pm e_1}$

$d_2 = \dfrac{\hat{d}_2}{1 \pm e_2}$