NumPy Trigonometric Functions

‹ Previous Next ›

Trigonometric Functions

NumPy provides the ufuncs `sin()`, `cos()` and `tan()` that take values in radians and produce the corresponding sin, cos and tan values.

Example

Find sine value of PI/2:

```
import numpy as np

x = np.sin(np.pi/2)

print(x)
```

Try it Yourself »

Example

Find sine values for all of the values in arr:

```
import numpy as np
```

```
arr = np.array([np.pi/2, np.pi/3, np.pi/4, np.pi/5])

x = np.sin(arr)

print(x)
```

Try it Yourself »

Convert Degrees Into Radians

By default all of the trigonometric functions take radians as parameters but we can convert radians to degrees and vice versa as well in NumPy.

Note: radians values are pi/180 * degree_values.

Example

Convert all of the values in following array arr to radians:

```
import numpy as np

arr = np.array([90, 180, 270, 360])

x = np.deg2rad(arr)

print(x)
```

Try it Yourself »

Radians to Degrees

Example

Convert all of the values in following array arr to degrees:

```
import numpy as np

arr = np.array([np.pi/2, np.pi, 1.5*np.pi, 2*np.pi])

x = np.rad2deg(arr)

print(x)
```

Try it Yourself »

Finding Angles

Finding angles from values of sine, cos, tan. E.g. sin, cos and tan inverse (arcsin, arccos, arctan).

NumPy provides ufuncs `arcsin()`, `arccos()` and `arctan()` that produce radian values for corresponding sin, cos and tan values given.

Example

Find the angle of 1.0:

```
import numpy as np

x = np.arcsin(1.0)

print(x)
```

Try it Yourself »

Angles of Each Value in Arrays

Example

Find the angle for all of the sine values in the array

```
import numpy as np

arr = np.array([1, -1, 0.1])

x = np.arcsin(arr)

print(x)
```

Try it Yourself »

Hypotenues

Finding hypotenues using pythagoras theorem in NumPy.

NumPy provides the `hypot()` function that takes the base and perpendicular values and produces hypotenues based on pythagoras theorem.

Example

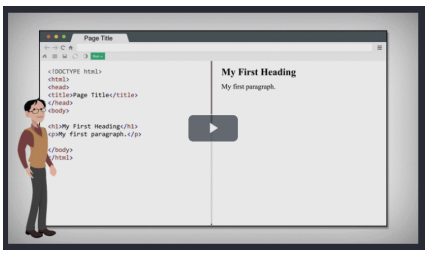
Find the hypotenues for 4 base and 3 perpendicular:

```
import numpy as np

base = 3
perp = 4

x = np.hypot(base, perp)

print(x)
```

Try it Yourself »

NEW

We just launched
W3Schools videos



Explore now

COLOR PICKER

Get certified
by completing
a Python
course today!

Get started

CODE GAME

Play Game

Report Error

Spaces

Pro

Get Certified

Top Tutorials

HTML Tutorial
CSS Tutorial
JavaScript Tutorial
How To Tutorial
SQL Tutorial
Python Tutorial
W3.CSS Tutorial
Bootstrap Tutorial
PHP Tutorial
Java Tutorial
C++ Tutorial
jQuery Tutorial

Top References

HTML Reference
CSS Reference
JavaScript Reference
SQL Reference
Python Reference
W3.CSS Reference
Bootstrap Reference
PHP Reference
HTML Colors
Java Reference
Angular Reference
jQuery Reference

Top Examples

HTML Examples
CSS Examples
JavaScript Examples
How To Examples
SQL Examples
Python Examples
W3.CSS Examples
Bootstrap Examples
PHP Examples
Java Examples
XML Examples
jQuery Examples

Get Certified

HTML Certificate
CSS Certificate
JavaScript Certificate
Front End Certificate
SQL Certificate
Python Certificate
PHP Certificate
jQuery Certificate
Java Certificate
C++ Certificate
C# Certificate
XML Certificate