NumPy Trigonometric Functions

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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)
```

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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)
```

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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 NumP.

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)
```

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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)
```

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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)
```

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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)
```

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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)
```

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