

# NumPy Searching Arrays

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## Searching Arrays

You can search an array for a certain value, and return the indexes that get a match.

To search an array, use the where() method.

### Example

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Find the indexes where the value is 4:

```
import numpy as np
arr = np.array([1, 2, 3, 4, 5, 4, 4])
x = np.where(arr == 4)
print(x)
```

Try it Yourself »

The example above will return a tuple: (array([3, 5, 6],)

Which means that the value 4 is present at index 3, 5, and 6.

```
import numpy as np
arr = np.array([1, 2, 3, 4, 5, 6, 7, 8])
x = np.where(arr%2 == 0)
print(x)
```

### Example

Try it Yourself »

Find the indexes where the values are odd:

```
import numpy as np
arr = np.array([1, 2, 3, 4, 5, 6, 7, 8])
x = np.where(arr%2 == 1)
print(x)
```

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### Search Sorted

There is a method called searchsorted() which performs a binary search in the array, and returns the index where the specified value would be inserted to maintain the search order.



### Example

Find the indexes where the value 7 should be inserted:

```
import numpy as np
arr = np.array([6, 7, 8, 9])
x = np.searchsorted(arr, 7)
print(x)
```

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Example explained: The number 7 should be inserted on index 1 to remain the sort order.

The method starts the search from the left and returns the first index where the number 7 is no longer larger than the next value.

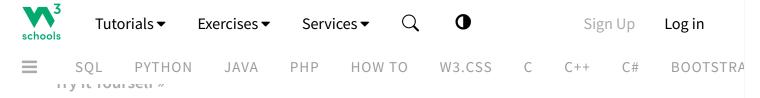
#### Search From the Right Side

By default the left most index is returned, but we can give side='right' to return the right most index instead.

### Example

Find the indexes where the value 7 should be inserted, starting from the right:

```
import numpy as np
arr = np.array([6, 7, 8, 9])
x = np.searchsorted(arr, 7, side='right')
```



Example explained: The number 7 should be inserted on index 2 to remain the sort order.

The method starts the search from the right and returns the first index where the number 7 is no longer less than the next value.

### Multiple Values

To search for more than one value, use an array with the specified values.

#### Example

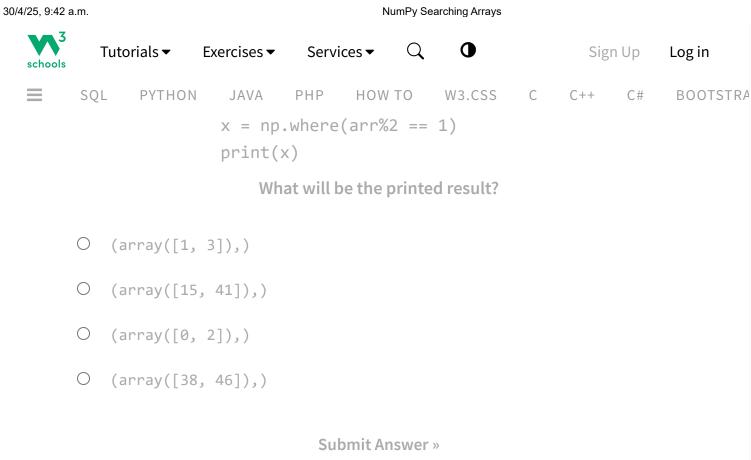
Find the indexes where the values 2, 4, and 6 should be inserted:

```
import numpy as np
arr = np.array([1, 3, 5, 7])
x = np.searchsorted(arr, [2, 4, 6])
print(x)
```

Try it Yourself »

The return value is an array: [1 2 3] containing the three indexes where 2, 4, 6 would be inserted in the original array to maintain the order.

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