NumPy – Syntax + Example Cheat Sheet (Professional)

> Goal: See syntax → see **tiny runnable example** → understand instantly

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1. Import NumPy

```
import numpy as np
```

Example:

```
print(np.__version__)
```

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2. Array Creation

```
import numpy as np

zeros_arr = np.zeros(3)
ones_arr  = np.ones(3)
list_arr  = np.array([1, 2, 3])
range_arr = np.arange(0, 6, 2)
```

Example:

```
print(zeros_arr)
print(ones_arr)
print(list_arr)
print(range_arr)
```

---

3. Array Info

```
import numpy as np

a = np.array([[1, 2, 3], [4, 5, 6]])
```

Example:

```
print(a.shape)
print(a.ndim)
print(a.size)
print(a.dtype)
```

---

4. Reshape & Flatten

```
import numpy as np

a = np.arange(6)
```

Example:

```
print(a.reshape(2, 3))
print(a.flatten())
```

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5. Indexing & Slicing

```
import numpy as np

a = np.array([[10, 20, 30], [40, 50, 60]])
```

Example:

```
print(a[0])      # first row
print(a[:, 1])   # second column
```

---

6. Boolean Indexing

```
import numpy as np

a = np.array([1, 5, 8, 10])
```

Example:

```
print(a[a > 5])
```

---

7. Math Operations (Element-wise)

```
import numpy as np

a = np.array([1, 2, 3])
```

Example:

```
print(a + 2)
print(a * 3)
```

---

8. Array vs Array Operations

```
import numpy as np

a = np.array([1, 2, 3])
b = np.array([4, 5, 6])
```

Example:

```
print(a + b)
print(a * b)
```

---

9. Universal Functions (ufuncs)

```
import numpy as np

a = np.array([1, 4, 9])
```

Example:

```
print(np.sqrt(a))
```

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10. Aggregation Functions

```
import numpy as np

a = np.array([[1, 2, 3], [4, 5, 6]])
```

Example:

```
print(np.sum(a))
print(np.mean(a, axis=0))
```

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11. Copy vs View

```
import numpy as np

a = np.array([1, 2, 3])
b = a.copy()
c = a.view()
```

Example:

```
a[0] = 99
print(b)   # unchanged
print(c)   # changed
```

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12. Concatenation & Stacking

```
import numpy as np

a = np.array([[1, 2]])
b = np.array([[3, 4]])
```

Example:

```
print(np.concatenate((a, b), axis=0))
print(np.hstack((a, b)))
```

---

13. Splitting Arrays

```
import numpy as np

a = np.array([1, 2, 3, 4])
```

Example:

```
print(np.split(a, 2))
```

---

14. Sorting

```
import numpy as np

a = np.array([3, 1, 2])
```

Example:

```
print(np.sort(a))
```

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15. Random Module

```
import numpy as np

np.random.seed(1)
```

Example:

```
print(np.random.randint(1, 10, size=3))
```

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16. Linear Algebra

```
import numpy as np

a = np.array([[1, 2], [3, 4]])
b = np.array([[5, 6], [7, 8]])
```

Example:

```
print(np.dot(a, b))
```

---

17. Where & Conditional

```
import numpy as np

a = np.array([1, 6, 3])
```

Example:

```
print(np.where(a > 3, 1, 0))
```

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18. Missing / Special Values

```
import numpy as np

a = np.array([1, np.nan, 2])
```

Example:

```
print(np.isnan(a))
```

---

19. Type Conversion

```
import numpy as np

a = np.array([1.2, 2.8, 3.5])
```

Example:

```
print(a.astype(int))
```

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20. Useful Tricks (ML Oriented)

```
import numpy as np

a = np.array([[1, 2], [3, 4]])
```

Example:

```
print(a.T)
print(np.argmax(a))
```

✅How to Use This Sheet

- Copy one topic
- Run it
- Change values and re-run

If this feels easy → you are **100% ready for Pandas & ML** 🚀