■ Full Python Cheatsheet

1. Variables & Data Types

```
x = 5              # int
y = 3.14           # float
name = 'Ana'       # string
flag = True        # bool
arr = [1,2,3]      # list
tup = (1,2,3)      # tuple
s = {1,2,3}        # set
d = {'a':1,'b':2}  # dict
```

2. Conditional Statements

```
if x > 0:
    print('Positive')
elif x == 0:
    print('Zero')
else:
    print('Negative')
# Short-hand
msg = 'Even' if x%2==0 else 'Odd'
# match-case (Python 3.10+)
match x:
    case 1: print('One')
    case 2 | 3: print('Two or Three')
    case _: print('Other')
```

3. Loops

```
for i in range(5): print(i)
while x > 0: x -= 1
for i, val in enumerate(arr): print(i,val)
for k,v in d.items(): print(k,v)
```

4. Functions

```
def add(a,b):
    return a+b
# Default & Keyword Args
def greet(name='User'): print('Hi',name)
greet(name='Ana')
# Lambda
square = lambda x: x*x
```

5. Classes & OOP

```
class Dog:
    def __init__(self,name):
        self.name = name
    def bark(self): print('Woof!')
d = Dog('Rex'); d.bark()
```

```
  # Inheritance
  class Animal: pass
  class Cat(Animal): pass

6. Exceptions
  try:
      x = 1/0
  except ZeroDivisionError:
      print('Error!')
  finally:
      print('Done')

7. File Handling
  with open('file.txt','r') as f:
      data = f.read()
  with open('out.txt','w') as f:
      f.write('Hello')

8. List Comprehension
  squares = [x*x for x in range(5)]
  evens = [x for x in range(10) if x%2==0]

9. Useful Built-ins
  len(arr), sum(arr), max(arr), min(arr)
  sorted(arr), reversed(arr)
  zip(list1,list2), map(func, arr), filter(cond, arr)

10. Modules & Libraries
  import math; math.sqrt(16)
  import random; random.randint(1,10)
  from datetime import date; print(date.today())

11. Advanced Topics
  # Generators
  def gen():
      yield 1; yield 2
  for v in gen(): print(v)
  # Decorators
  def decorator(func):
      def wrapper():
          print('Before'); func(); print('After')
      return wrapper
  @decorator
  def hello(): print('Hello')
  hello()

12. Popular Libraries
  import numpy as np
```

```
arr = np.array([1,2,3])
import pandas as pd
df = pd.DataFrame({'a':[1,2],'b':[3,4]})
import matplotlib.pyplot as plt
plt.plot([1,2,3],[4,5,6]); plt.show()
```