

```

42 print("-"*30)
43 print("Shape:", arr2d.shape)
44 print("Size (elements):", arr2d.size)
45 print("Dimensions:", arr2d.ndim)
46 print("Item size (bytes):", arr2d.itemsize)
47 print("Data type:", arr2d.dtype)
48 print("="*50)
49
50 # 3. Basic Operations
51 print("3. Basic Operations (Element-wise)")
52 print("-"*30)
53 a = np.array([10, 20, 30, 40])
54 b = np.array([1, 2, 3, 4])
55 print("a:", a)
56 print("b:", b)
57 print("a + b:", a + b)
58 print("a - b:", a - b)
59 print("a * b:", a * b)
60 print("a / b:", a / b)
61 print("a ** 2:", a ** 2)
62 print("sin(a):", np.sin(a))
63 print("sqrt(a):", np.sqrt(a))
64 print("="*50)
65
66 # 4. Indexing & Slicing
67 print("4. Indexing and Slicing")
68 print("-"*30)
69 arr = np.array([10, 20, 30, 40, 50, 60])
70 print("arr:", arr)
71 print("First element :", arr[0])
72 print("Last element :", arr[-1])
73 print("Slice [1:4] :", arr[1:4])
74 print("Every 2nd:", arr[::2])
75 print("Reverse:", arr[::-1])
76
77 # 2D Indexing
78 matrix = np.array([[1, 2, 3],
79 [4, 5, 6],
80 [7, 8, 9]])
81 print("\n2D Matrix:\n", matrix)
82 print("Element [1,2] :", matrix[1, 2]) # row 1, col 2 + 6
83 print("First row:", matrix[0])
84 print("First column:", matrix[:, 0])
85 print("Submatrix 2x2:\n", matrix[:2, :2])
86 print("="*50)
87
88 # 5. Reshaping Arrays
89 print("5. Reshaping")

```