NumPy

1. What does NumPy primarily provide?
A. File handling tools
B. Data analysis APIs
C. Multi-dimensional array support
D. Web scraping utilities
Answer: C

2. What function is used to create an array in NumPy?
A. array()
B. list()
C. tuple()
D. set()
Answer: A

3. What does np.zeros((2,3)) return?
A. An array of ones
B. A 2x3 array of zeros
C. A scalar zero
D. Error
Answer: B

4. Which method flattens a NumPy array?
A. flatten()
B. expand()
C. reshape()
D. flat()
Answer: A

5. Which of the following is used to find the maximum in NumPy array?
A. max()
B. np.maximum()
C. np.max()
D. np.argmax()
Answer: C

6. Which of the following returns evenly spaced values over a specified interval?
A. np.arange()
B. np.linspace()
C. np.array_range()
D. np.series()
Answer: B

7. What does np.eye(3) create?
A. Zero matrix
B. Identity matrix
C. Diagonal matrix
D. Ones matrix
Answer: B

8. Which function stacks arrays vertically?
A. np.vstack()
B. np.hstack()
C. np.merge()
D. np.concat()
Answer: A

 Pandas

9. What is a DataFrame in pandas?
A. Single-dimensional array
B. Dictionary
C. Two-dimensional labeled data structure
D. SQL table
Answer: C

10. What method is used to read a CSV file in pandas?
A. readfile()
B. openfile()
C. pandas.read_csv()
D. read_csv_file()
Answer: C

11. Which method shows first five rows of a DataFrame?
A. head(5)
B. top(5)
C. show(5)
D. first(5)
Answer: A

12. What does dropna() do in pandas?
A. Drops duplicates
B. Drops empty rows
C. Drops index
D. Drops column names
Answer: B

13. What is the output of df.shape?
A. Count of NaNs
B. Count of columns
C. Tuple of (rows, columns)
D. Total values in DataFrame
Answer: C

14. How to filter rows where column 'Age' is greater than 30?
A. df.filter(Age > 30)
B. df[df.Age > 30]
C. df.select(Age > 30)
D. df.where(Age > 30)
Answer: B

15. Which function fills missing values in pandas?
A. dropna()
B. fillna()
C. replace()
D. remove_na()
Answer: B

16. How to sort values by column 'Salary'?
A. df.order_by(Salary)
B. df.sort_values('Salary')
C. df.sort_by('Salary')
D. df.sort(Salary)
Answer: B

 Unit Test

17. Which Python module is used for unit testing?
A. pytest
B. unittest
C. testing
D. mock
Answer: B

18. Which method is used to check equality in unit tests?
A. assertEquals()
B. assertEqual()
C. checkEqual()

D. isEqual()
Answer: B

19. Which is the correct test method name format in unittest?
A. function_test()
B. testFunction()
C. test_function()
D. TestFunction()
Answer: C

20. What is the purpose of setUp() in unittest?
A. Tear down test case
B. Setup database
C. Initialize test environment
D. Clean up logs
Answer: C

21. How to run all unit tests from command line?
A. python -m unittest
B. run tests
C. pytest all
D. test run
Answer: A

22. What does tearDown() method do?
A. Skips test
B. Prepares input
C. Cleans up after test
D. Executes test
Answer: C

Pytest

23. What's the file naming convention for Pytest?
A. test.py
B. test_*.py
C. check_*.py
D. unittest.py
Answer: B

24. Which keyword is used to assert conditions in Pytest?

A. check
B. expect
C. assert
D. verify
Answer: C

25. What will pytest -k "name" do?
A. Run all test files
B. Run test cases with "name" in their names
C. Kill all running tests
D. Keep test logs
Answer: B

26. What is the default test discovery directory in pytest?
A. /src
B. /main
C. Current directory
D. /tests
Answer: C

27. What is used to group related tests in Pytest?
A. describe
B. suite
C. class
D. module
Answer: C

28. How do you mark a test to skip in Pytest?
A. @skip
B. @pytest.skip()
C. @pytest.mark.skip
D. @ignore
Answer: C

HTML

29. Which tag is used to create a hyperlink in HTML?
A. <link>
B. <a>
C. <href>
D. <url>

Answer: B

30. Which tag is used to create a table row?
A. <tr>
B. <td>
C. <th>
D. <table>
Answer: A

31. What is the correct HTML for inserting an image?
A. <img href="image.jpg">
B. <img src="image.jpg">
C. <image src="image.jpg">
D. <img link="image.jpg">
Answer: B

32. What is the purpose of <head> tag in HTML?
A. To display the heading
B. To define metadata
C. To include the body
D. To style the page
Answer: B

33. Which input type is used to select a file?
A. text
B. upload
C. file
D. select
Answer: C

34. What does <br> tag do?
A. Bold the text
B. Break a line
C. Display an image
D. Add a table row
Answer: B

CSS

35. Which CSS property changes the text color?
A. text-color
B. font-color

C. color
D. textstyle
Answer: C

36. How to include an external CSS file?
A. <style src="style.css">
B. <css href="style.css">
C. <link rel="stylesheet" href="style.css">
D. <stylesheet>style.css</stylesheet>
Answer: C

37. Which selector selects all <p> elements?
A. #p
B. p
C. .p
D. *p
Answer: B

38. Which property sets the background color?
A. bgcolor
B. background
C. background-color
D. color-bg
Answer: C

39. How to center text using CSS?
A. text-position: center;
B. align: center;
C. text-align: center;
D. text-center: true;
Answer: C

40. What does margin: 0 auto; do?
A. Sets top and bottom margins
B. Centers an element horizontally
C. Removes all margins
D. Adds padding
Answer: B
Here are 60 unique multiple-choice questions (MCQs) (with 4 options each and 1 correct answer) divided across the topics:

1. Which tag is used to insert a line break in HTML?
A) <break>

B)
C) <lb>
D) <line>
Answer: B

2. What is the correct HTML element for the largest heading?
A) <heading>
B) <h6>
C) <h1>
D) <head>
 Answer: C

3. Which tag is used to define a hyperlink in HTML?
A) <a>
B) <href>
C) <link>
D) <hyper>
 Answer: A

4. Which attribute is used to open a link in a new tab?
A) new
B) target="_new"
C) target="_blank"
D) open="new"
 Answer: C

5. Which tag is used to embed an image in a webpage?
A) <img>
B) <image>
C) <src>
D) <pic>
Answer: A

6. What is the correct HTML tag for creating a checkbox?
A) <checkbox>
B) <input type="checkbox">
C) <check>
D) <input checkbox>
 Answer: B

7. Which HTML tag is used to define an unordered list?
A)
B)
C)
D) <list>
 Answer: B

8. What does the <title> tag define?
A) The title of the page content
B) The title bar of the browser
C) The heading of the body
D) A tooltip for images
 Answer: B

9. Which tag is used to create a table row?
A) <tr>
B) <td>
C) <row>
D) <th>
Answer: A

10. Which input type is used for a password field?
A) type="text"
B) type="secure"
C) type="password"
D) type="hidden"
Answer: C

 CSS (10 Questions)

11. Which property is used to change the background color in CSS?
A) color
B) background-color
C) bgcolor
D) back-color
 Answer: B

12. Which CSS property controls the text size?

A) font-style
B) text-size
C) font-size
D) size
 Answer: C

13. How do you select an element with id main in CSS?
A) #main
B) .main
C) main
D) $main
 Answer: A

14. Which value of position will place the element relative to its nearest positioned ancestor?
A) fixed
B) absolute
C) static
D) relative
Answer: B

15. How do you apply a style to all <p> elements?
A) p {}
B) #p {}
C) .p {}
D) <p> {}
Answer: A

16. Which property adds space inside the border of an element?
A) margin
B) padding
C) spacing
D) gap
 Answer: B

17. What does display: none do to an element?
A) Hides it and removes from layout
B) Makes it invisible but keeps space
C) Reduces opacity to 0
D) Makes it transparent

Answer: A

18. Which property is used to change font in CSS?
A) text-font
B) font-style
C) font-family
D) font-name
Answer: C

19. Which pseudo-class is used for styling links when hovered?
A) :focus
B) :visited
C) :hover
D) :active
 Answer: C

20. How to make a list display horizontally in CSS?
A) list-style: horizontal;
B) display: inline;
C) display: block;
D) float: list;
 Answer: B

 NumPy (10 Questions)

21. Which function is used to create an array in NumPy?
A) array()
B) np.array()
C) create()
D) numpy.array()
 Answer: B

22. What does np.zeros((2,3)) return?
A) A 1D array
B) A 2x3 matrix filled with zeros
C) An error
D) A 3x2 matrix
 Answer: B

23. Which method is used to create a range of evenly spaced values?
A) np.linspace()
B) np.arange()
C) np.range()
D) np.spread()
 Answer: B

24. Which function gives the shape of a NumPy array?
A) shape()
B) array.shape()
C) array.size()
D) array.shape
 Answer: D

25. What does np.mean() calculate?
A) Mode
B) Median
C) Minimum
D) Average
Answer: D

26. How do you get the number of elements in an array?
A) array.length()
B) array.count()
C) array.size
D) array.shape
 Answer: C

27. What is the result of np.array([1,2,3]) * 2?
A) [1,2,3,1,2,3]
B) [2,4,6]
C) [1,2,3]
D) Error
Answer: B

28. Which function stacks arrays vertically?
A) np.vstack()
B) np.append()
C) np.vstacked()

D) np.add()

Answer: A

29. Which attribute shows the data type of an array?

A) array.dtype()

B) array.dtype

C) array.type

D) array.datatype

Answer: B

30. Which function sorts an array?

A) np.sort()

B) np.arrange()

C) np.ordered()

D) np.sorted()

Answer: A

Pandas (10 Questions)

31. Which object is used to represent tabular data in Pandas?

A) Series

B) DataList

C) DataFrame

D) Table

Answer: C

32. What does df.head() return?

A) Last 5 rows

B) First 5 rows

C) Row headers

D) Column headers

Answer: B

33. How to read a CSV file in pandas?

A) pd.load("file.csv")

B) pd.read("file.csv")

C) pd.read_csv("file.csv")

D) pd.open_csv("file.csv")

Answer: C

34. What does df.shape return?
A) Number of columns
B) Number of rows
C) (rows, columns)
D) Index values
 Answer: C

35. How to select a column named 'Age' from DataFrame df?
A) df.select("Age")
B) df.Age
C) df->Age
D) df(Age)
Answer: B

36. Which method removes rows with missing data?
A) drop()
B) dropna()
C) remove_null()
D) delete_na()
 Answer: B

37. Which method replaces missing values with a specified value?
A) fillna()
B) replace_null()
C) fill()
D) setna()
 Answer: A

38. Which function provides statistical summary?
A) summary()
B) stats()
C) describe()
D) mean()
 Answer: C

39. Which axis represents rows in Pandas?
A) 0
B) 1

C) -1
D) 2
 Answer: A

40. How to group data by column in Pandas?
A) df.classify()
B) df.aggregate()
C) df.groupby("col")
D) df.cluster("col")
 Answer: C

 unittest (10 Questions)

41. Which module is used for unit testing in Python?
A) test
B) pytest
C) unittest
D) testcase
Answer: C

42. Which class is inherited to write test cases?
A) UnitTest
B) TestClass
C) TestCase
D) TestSuite
 Answer: C

43. Which method checks if two values are equal?
A) assertEqual()
B) assertTrue()
C) assertSame()
D) assert()
 Answer: A

44. Which method is called before every test case?
A) setUpClass()
B) beforeTest()
C) initTest()
D) setUp()

Answer: D

45. Which method runs after every test case?
A) tearDown()
B) afterTest()
C) exitTest()
D) cleanUp()
 Answer: A

46. How to skip a test in unittest?
A) @skipTest
B) @unittest.skip
C) skip()
D) @skip_case
Answer: B

47. Which function is used to run all test cases?
A) runTest()
B) main()
C) execute()
D) startTest()
Answer: B

48. Which assertion checks if a value is true?
A) assertTrue()
B) assertEquals(True)
C) assertYes()
D) assertBoolean()
 Answer: A

49. Which decorator skips a test based on a condition?
A) @skipIf
B) @skip
C) @skipUnless
D) @conditionalSkip
 Answer: A

50. What is the default method name for a test case?

A) run()
B) test_case()
C) test_*
D) test()
Answer: C

pytest (10 Questions)

51. Which command runs all pytest tests?
A) python test.py
B) run test
C) pytest
D) py.test.run()
 Answer: C

52. What prefix should test functions have in pytest?
A) check_
B) case_
C) test_
D) run_
 Answer: C

53. Which keyword is used to group tests in pytest?
A) @category
B) @describe
C) @pytest.mark
D) @testgroup
 Answer: C

54. Which assertion style is used in pytest?
A) assertEqual()
B) assert x == y
C) check(x,y)
D) equals()
 Answer: B

55. How to skip a test in pytest?
A) @pytest.skip()
B) skip()
C) @pytest.mark.skip

D) skip_test()
Answer: C

56. How to run only one specific test function?
A) pytest -test functionname
B) pytest test_file.py::test_function
C) run test_file.test_function()
D) pytest.run(function)
 Answer: B

57. Which fixture is used to set up resources before tests?
A) @setup
B) @pytest.before
C) @pytest.fixture
D) @preload
 Answer: C

58. What does -k flag do in pytest?
A) Stops after a test fails
B) Filters test names by substring
C) Specifies test directory
D) Adds coverage
Answer: B

59. What does -v flag do in pytest?
A) Run tests verbosely
B) Validate output
C) Version display
D) Visual test
Answer: A

60. Which file naming pattern is followed in pytest?
A) case_*.py
B) test_*.py
C) unit_*.py
D) check_*.py
Answer: B

Coding Questions

1. List Comprehension with Condition & Nested Loop

Question:
Generate a list of tuples (i, j) where i is from 1 to 3 and j is from 1 to 3, but only include when i != j.

Input:
List of (i, j) for i, j in 1 to 3 and i ≠ j

Expected Output:

[(1, 2), (1, 3), (2, 1), (2, 3), (3, 1), (3, 2)]

2. Dictionary with List Values and Comprehension

Question:
Create a dictionary with keys A, B, C and each key maps to a list of squares of first 3 natural numbers.

Input:
Keys: ['A', 'B', 'C']
Values: Squares of 1 to 3

Expected Output:

{'A': [1, 4, 9], 'B': [1, 4, 9], 'C': [1, 4, 9]}
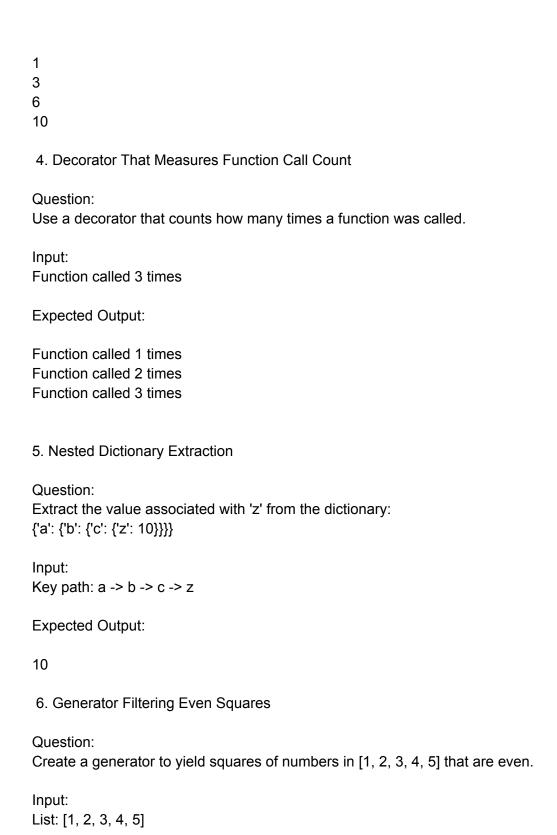
3. Generator with Running Sum

Question:
Create a generator that yields the cumulative sum of numbers in the list [1, 2, 3, 4].

Input:
List: [1, 2, 3, 4]

Expected Output:

1
3
6
10

4. Decorator That Measures Function Call Count

Question:
Use a decorator that counts how many times a function was called.

Input:
Function called 3 times

Expected Output:

Function called 1 times
Function called 2 times
Function called 3 times

5. Nested Dictionary Extraction

Question:
Extract the value associated with 'z' from the dictionary:
{'a': {'b': {'c': {'z': 10}}}}

Input:
Key path: a -> b -> c -> z

Expected Output:

10

6. Generator Filtering Even Squares

Question:
Create a generator to yield squares of numbers in [1, 2, 3, 4, 5] that are even.

Input:
List: [1, 2, 3, 4, 5]

Expected Output:

4
16

7. Decorator Adding Logging to Function

Question:
Use a decorator that logs the function name and arguments before execution.

Input:
Calling: multiply(3, 4)

Expected Output:

Calling function 'multiply' with args (3, 4)
12

8. List of Dictionaries with Filtering

Question:
Filter a list of dictionaries to return names with age > 25.
Input list:
[{'name': 'Alice', 'age': 22}, {'name': 'Bob', 'age': 28}]

Input:
Filter where age > 25

Expected Output:

['Bob']

9. Generator Expression with Condition

Question:
Create a generator that yields numbers divisible by 3 from 1 to 15.

Input:
Range: 1 to 15

Expected Output:

3
6
9
12
15

10. Decorator That Prevents Division by Zero

Question:
Use a decorator to prevent calling a function that divides two numbers if the divisor is 0.

Input:
Call: safe_divide(10, 0)
Call: safe_divide(10, 2)

Expected Output:

Cannot divide by zero
5.0