Worksheets

Python - OOPs, GUI and Numpy

Total questions: 30

Worksheet time: 30mins

Instructor name: Anik Acharjee

Name

Class

Date

1. **What does the ndim attribute of a NumPy array return?**

a) The data type of the array elements.

b) The number of dimensions of the array.

c) The size of the array in bytes.

d) The total number of elements in the array.

2. **What is the shape of an array?**

a) The memory address where the array is stored.

b) The dimensions of the array, represented as a tuple.

c) The data type of the array elements.

d) The number of elements the array can store.

3. **How does the reshape method function in NumPy?**

a) It changes the total number of elements in the array.

b) It changes the shape of the array without altering the data.

c) It sorts the array elements.

d) It changes the data type of the array elements.

4. **What does slicing a NumPy array do?**

a) It deletes elements from the array.

b) It creates a new array with a specified shape.

c) It transposes the array.

d) It creates a view of the array with selected elements.

5. **What is the result of transposing a 1D NumPy array?**

a) The same 1D array.

b) A 2D column vector.

c) A 2D row vector.

d) An error is raised.

6. **Which of the following is the correct way to slice the third column from a 2D NumPy array arr?**

a) arr[2]

b) arr[:, 2]

c) arr[..., 2]

d) arr[2, :]

7. **How can you identify if a reshaped array is a view or a copy?**

a) By checking the size attribute.

b) By checking the shape attribute.

c) By checking if the base attribute is None.

d) By checking the dtype attribute.

8. **What will be the shape of an array after applying arr.reshape(-1)?**

a) The shape will be a 2D array with one row.

b) The shape will be a 2D array with one column.

c) The shape will be a 1D array.

d) The shape will be unchanged.

9. **Which NumPy function is used to transpose a 2D array?**

a) np.rot90()

b) np.swapaxes()

c) np.transpose()

d) np.flip()

10. **What does the shape attribute of a NumPy array return when applied to a 3x4 array?**

a) 12
b) 3x4
c) (3, 4)
d) (4, 3)

11. **What is NumPy primarily used for in data analysis?**

a) Web development
b) Text processing
c) Numerical computing
d) Graphic design

12. **Which of the following is a key feature of NumPy arrays?**

a) Support for different data types in the same array
b) Homogeneity of data type
c) In-built version control
d) Automatic data visualization

13. **How does NumPy achieve high performance and efficiency?**

a) Through network-based data handling
b) Through interpreted Python code
c) By using dynamic typing
d) By using fixed types and contiguous memory allocation

14. **What is the default data type of a NumPy array when you create an array using np.array()?**

a) int32
b) bool
c) int64
d) float64

15. **Which function would you use to create an identity matrix in NumPy?**

a) np.zeros()

b) np.identity()

c) np.array()

d) np.ones()

16. **Which slicing operation retrieves elements from index 1 to 4 in a one-dimensional NumPy array arr?**

a) arr[1:4]

b) arr[1:5]

c) arr

d) arr to arr

17. **Which function is used to create a main window in Tkinter?**

a) mainloop()

b) Tk()

c) Window()

d) Frame()

18. **What is the correct way to start the Tkinter event loop?**

a) eventloop()

b) mainloop()

c) startloop()

d) beginloop()

19. **How can you install Tkinter in your system?**

a) pip install Tkinter

b) pip install tkinter

c) pip install python-tk

d) Tkinter comes pre-installed with Python

20. **How do you change the font color of a label widget in Tkinter?**

a) Use the 'fontcolor' option
b) Use the 'color' option
c) Use the 'fg' option
d) Use the 'textcolor' option

21. **What is a class in Python?**

a) A module used exclusively in Python.
b) A built-in Python data type.
c) A function that creates an object.
d) A blueprint for creating objects.

22. **Which of the following is true about objects in Python?**

a) Classes are real-world entities while objects are not real.
b) Both objects and classes are not real.
c) Both objects and classes are real-world entities.
d) Objects are real-world entities while classes are not real.

23. **How is inheritance implemented in Python?**

a) Using standalone functions only.
b) By creating independent classes without any relationship.
c) By deriving new classes from existing classes which inherit attributes and methods.
d) Through direct modification of existing classes.

24. **What does encapsulation help achieve in Python?**

a) It allows classes to inherit directly from multiple parent classes.
b) It restricts access to methods and variables, preventing data from direct modification.
c) It enables classes to be transformed into methods.
d) It allows an object to take on multiple forms.

25. **Which statement is true about polymorphism in Python?**

a) It is not supported by Python.

b) It restricts an object to only one specific form.

c) It prevents methods from being reused in multiple classes.

d) It allows objects to share the same interface for different underlying forms (data types).

26. **What is method overriding in Python?**

a) Changing the way a method works without altering its name.

b) Using different method names to perform similar tasks.

c) Using multiple methods with the same name within a single class.

d) Removing a method from a class.

27. **How do you create a subclass in Python?**

a) By using the subclass keyword.

b) By passing the base class as a parameter to the subclass.

c) By calling a function from the base class.

d) By declaring the subclass independent of the base class.

28. **Which of the following is an example of class instantiation in Python?**

```
class MyClass:
def init(self, value):
self.value = value
obj = MyClass(10)
```

a) def **init**(self, value):

b) obj = MyClass(10)

c) class MyClass:

d) self.value = value

29. **What is the output of the following code if polymorphism is applied correctly?**

```
class Animal:
def make_sound(self):
return 'Some sound'
class Dog(Animal):
def make_sound(self):
return 'Bark'
animal = Animal()
dog = Dog()
print(animal.make_sound(), dog.make_sound())
```

a) Error

b) Bark Bark

c) Some sound Some sound

d) Some sound Bark

30. **Which keyword is used to define a private variable inside a class in Python?**

a) private

b) nonpublic

c) _

d) __

Answer Keys

1. b) The number of dimensions of the array.
2. b) The dimensions of the array, represented as a tuple.
3. b) It changes the shape of the array without altering the data.
4. d) It creates a view of the array with selected elements.
5. a) The same 1D array.
6. b) arr[:, 2]
7. c) By checking if the base attribute is None.
8. c) The shape will be a 1D array.
9. c) np.transpose()
10. c) (3, 4)
11. c) Numerical computing
12. b) Homogeneity of data type
13. d) By using fixed types and contiguous memory allocation
14. c) int64
15. b) np.identity()
16. b) arr[1:5]
17. b) Tk()
18. b) mainloop()
19. d) Tkinter comes pre-installed with Python
20. c) Use the 'fg' option
21. d) A blueprint for creating objects.
22. d) Objects are real-world entities while classes are not real.
23. c) By deriving new classes from existing classes which inherit attributes and methods.
24. b) It restricts access to methods and variables, preventing data from direct modification.
25. d) It allows objects to share the same interface for different underlying forms (data types).
26. a) Changing the way a method works without altering its name.
27. b) By passing the base class as a parameter to the subclass.
28. b) obj = MyClass(10)
29. d) Some sound Bark
30. d) __