

a3-numpy

November 14, 2024

```
[3]: '''  
Write a NumPy program to create a structured array from given  
student name, height, class and their data types.  
Finally sort the array on height  
'''
```

```
[3]: '\nWrite a NumPy program to create a structured array from given \nstudent name,  
height, class and their data types. \nFinally sort the array on height\n'
```

```
[5]: # Importing the NumPy library  
import numpy as np  
  
# Defining the data types for the structured array  
data_type = [('name', 'S15'), ('class', int), ('height', float)]  
  
# Creating a structured array 'students' using the defined data type and  
# provided details  
  
students = np.zeros(4, dtype= data_type)  
  
students['name'] = ['amith', 'dhanush', 'hemanth', 'hitesh']  
students['class'] = [5,6,5,5]  
students['height'] = [48.5, 53, 42.5, 40]  
  
# Displaying the original structured array  
print("Original array:")  
print(students)  
  
# Sorting the structured array by 'height' field  
print("Sort by height")  
print(np.sort(students, order='height'))
```

Original array:

```
[(b'amith', 5, 48.5) (b'dhanush', 6, 53. ) (b'hemanth', 5, 42.5)  
 (b'hitesh', 5, 40. )]
```

Sort by height

```
[(b'hitesh', 5, 40. ) (b'hemanth', 5, 42.5) (b'amith', 5, 48.5)  
 (b'dhanush', 6, 53. )]
```

```
[7]: # Importing the NumPy library
import numpy as np

# Defining the data types for the structured array
data_type = [('name', 'S15'), ('class', int), ('height', float)]

# Creating a structured array 'students' using the defined data type and
↳ provided details
n=int(input('enter the number of students:'))
names = []
classes=[]
heights=[]
for i in range(n):
    x=input('enter the name:')
    y=int(input('enter the class:'))
    z=float(input('enter the height:'))
    names.append(x)
    classes.append(y)
    heights.append(z)
students = np.zeros(n, dtype= data_type)

students['name'] = names
students['class'] = classes
students['height'] = heights

# Displaying the original structured array
print("Original array:")
print(students)

# Sorting the structured array by 'height' field
print("Sort by height")
print(np.sort(students, order='height'))
```

```
enter the number of students:3
enter the name:amith
enter the class:4
enter the height:78
enter the name:hemanth
enter the class:4
enter the height:56
enter the name:dhanush
enter the class:5
enter the height:66
Original array:
[(b'amith', 4, 78.) (b'hemanth', 4, 56.) (b'dhanush', 5, 66.)]
Sort by height
[(b'hemanth', 4, 56.) (b'dhanush', 5, 66.) (b'amith', 4, 78.)]
```

```
[1]: # Importing the NumPy library
import numpy as np

# Defining the data types for the structured array
data_type = [('name', 'S15'), ('class', int), ('height', float)]

# Defining the details of students as a list of tuples
students_details = [('James', 5, 48.5), ('Nail', 6, 52.5), ('Paul', 5, 42.10),
                    ↪('Pit', 5, 40.11)]

# Creating a structured array 'students' using the defined data type and
↪provided details
students = np.array(students_details, dtype=data_type)

# Displaying the original structured array
print("Original array:")
print(students)

# Sorting the structured array by 'height' field
print("Sort by height")
print(np.sort(students, order='height'))
```

Original array:

```
[(b'James', 5, 48.5 ) (b'Nail', 6, 52.5 ) (b'Paul', 5, 42.1 )
 (b'Pit', 5, 40.11)]
```

Sort by height

```
[(b'Pit', 5, 40.11) (b'Paul', 5, 42.1 ) (b'James', 5, 48.5 )
 (b'Nail', 6, 52.5 )]
```

[]: