NumPy Array Input and Output in Python

This program takes 'n' integer inputs from the user,

stores them in a list, converts it to a NumPy array,

and then prints the array.

```
import numpy as np

n = int(input("How many elements? "))
elements = []

for i in range(n):
    val = int(input(f"Enter element {i+1}: "))
    elements.append(val)

arr = np.array(elements)
print("NumPy array:", arr)
```

```
How many elements?  3
Enter element 1:  10
Enter element 2:  20
Enter element 3:  30

NumPy array: [10 20 30]
```

□ NumPy Array Input, Output & Value Update

This program:

1. Takes 'n' elements from the user

2. Creates a NumPy array

3. Displays the array

4. Lets the user update a value at a given index

```
import numpy as np

# Step 1: Input elements
n = int(input("How many elements? "))
elements = []

for i in range(n):
    val = int(input(f"Enter element {i+1}: "))
    elements.append(val)

# Step 2: Create NumPy array
arr = np.array(elements)
print("Original NumPy array:", arr)

# Step 3: Update a value
index = int(input("Enter index to update (0-based): "))
if 0 <= index < n:
    new_value = int(input("Enter new value: "))
    arr[index] = new_value
    print("Updated NumPy array:", arr)
else:
    print("□ Invalid index! No changes made.")
```

```
How many elements?  3
Enter element 1:  10
Enter element 2:  20
Enter element 3:  30

Original NumPy array: [10 20 30]

Enter index to update (0-based):  1
Enter new value:  100

Updated NumPy array: [ 10 100  30]
```

NumPy Array Input and Add +1 to All Elements

This program:

1. Takes 'n' elements from user

2. Creates a NumPy array

3. Adds +1 to each element (bonus marks)

4. Displays both original and updated arrays

```python
import numpy as np

# Step 1: Input elements
n = int(input("How many elements? "))
elements = []

for i in range(n):
    val = int(input(f"Enter element {i+1}: "))
    elements.append(val)

# Step 2: Create NumPy array
```

```
arr = np.array(elements)
print("Original NumPy array:", arr)

# Step 3: Add +1 to each element
updated_arr = arr + 1

# Step 4: Display updated array
print("Updated array (+1 to each element):", updated_arr)
```

```
How many elements?  3
Enter element 1:  10
Enter element 2:  20
Enter element 3:  30

Original NumPy array: [10 20 30]
Updated array (+1 to each element): [11 21 31]
```

□ Calculate Percentage of Marks using NumPy

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1. Takes marks for 'n' subjects as input

2. Uses NumPy array for calculation

3. Calculates total and percentage

4. Displays all results

```
import numpy as np

# Step 1: Input marks
n = int(input("Enter number of subjects: "))
marks = []

for i in range(n):
    val = float(input(f"Enter marks for subject {i+1}: "))
```

```
    marks.append(val)

# Step 2: Create NumPy array
arr = np.array(marks)

# Step 3: Calculate total and percentage
total = arr.sum()
percentage = (total / (n * 100)) * 100  # Assuming each subject is out
of 100

# Step 4: Display results
print("\n Marks Analysis")
print("----------------------")
print("Marks entered:", arr)
print("Total marks:", total)
print("Percentage:", round(percentage, 2), "%")
```

```
Enter number of subjects:  3
Enter marks for subject 1:  70
Enter marks for subject 2:  80
Enter marks for subject 3:  90


 Marks Analysis
----------------------
Marks entered: [70. 80. 90.]
Total marks: 240.0
Percentage: 80.0 %
```

□ NumPy Array with Fixed Size + Find Length

This code:

1. Defines the size of the array in the code itself

2. Takes 'size' number of elements as input

3. Creates a NumPy array and finds its length

```
import numpy as np

# Step 1: Set fixed size
size = 5  # □ You can change this to any number

# Step 2: Take 'size' inputs
elements = []
for i in range(size):
    val = int(input(f"Enter element {i+1}: "))
    elements.append(val)

# Step 3: Create NumPy array
arr = np.array(elements)

# Step 4: Find and display length
print("\nYour NumPy array:", arr)
print("Length of the array:", len(arr))
```

```
Enter element 1:  4
Enter element 2:  2
Enter element 3:  3
Enter element 4:  5
Enter element 5:  3
```

```
Your NumPy array: [4 2 3 5 3]
Length of the array: 5
```