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Practical-9

Aim: Write program using array

a. Write a Python program to create an array of 5 integers and display the array items. Access individual element through indexes.
b. Write a Python program to append a new item to the end of the array.
c. Write a Python program to reverse the order of the items in the array.
d. Write a Python program to insert a new item before the second element in an existing array.
e. Write a program to create a square matrix and print it in spiral form

a. Write a Python program to create an array of 5 integers and display the array items. Access individual element through indexes.

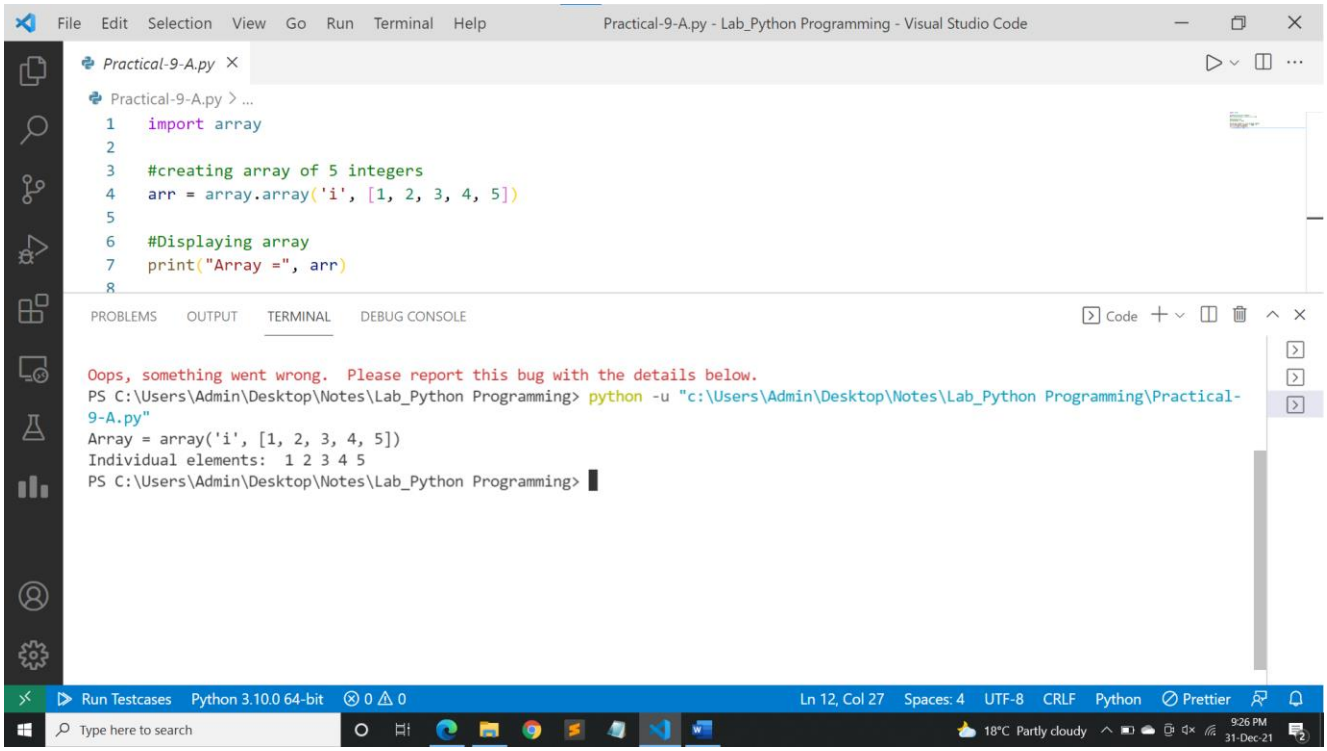
Program:

```
import array

#creating array of 5 integers
arr = array.array('i', [1, 2, 3, 4, 5])

#Displaying array
print("Array =", arr)

#accessing element of array through indexes
print("Individual elements: ", end=' ')
for i in range (len(arr)):
    print(arr[i], end=' ')
```

Output:

```
Array = array('i', [1, 2, 3, 4, 5])
Individual elements:  1 2 3 4 5
```

Screenshot:



b. Write a Python program to append a new item to the end of the array.

Program:

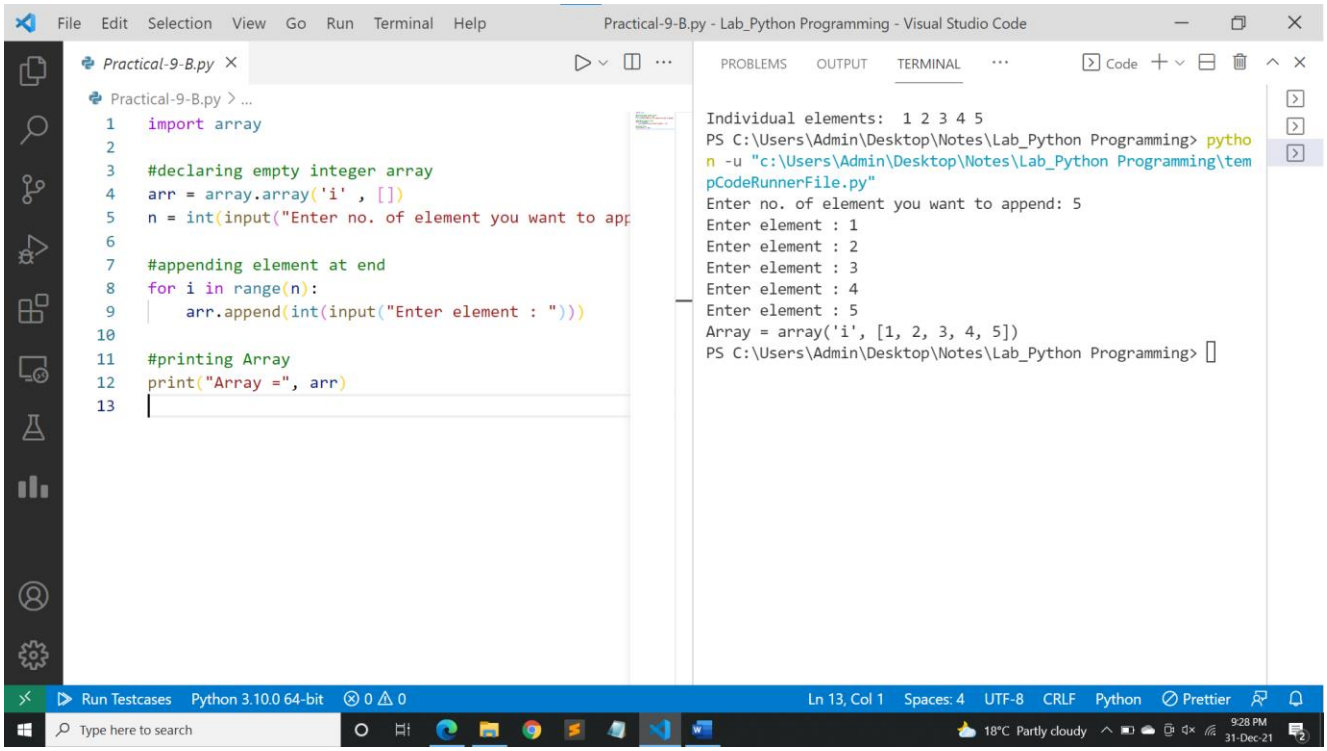
```
import array

#declaring empty integer array
arr = array.array('i' , [])
n = int(input("Enter no. of element you want to append: "))

#appending element at end
for i in range(n):
    arr.append(int(input("Enter element : ")))

#printing Array
print("Array =", arr)
```

Output:

```
Enter no. of element you want to append: 5
```

```
Enter element : 1
Enter element : 2
Enter element : 3
Enter element : 4
Enter element : 5
Array = array('i', [1, 2, 3, 4, 5])
```

Screenshot:



c. Write a Python program to reverse the order of the items in the array.

Program:

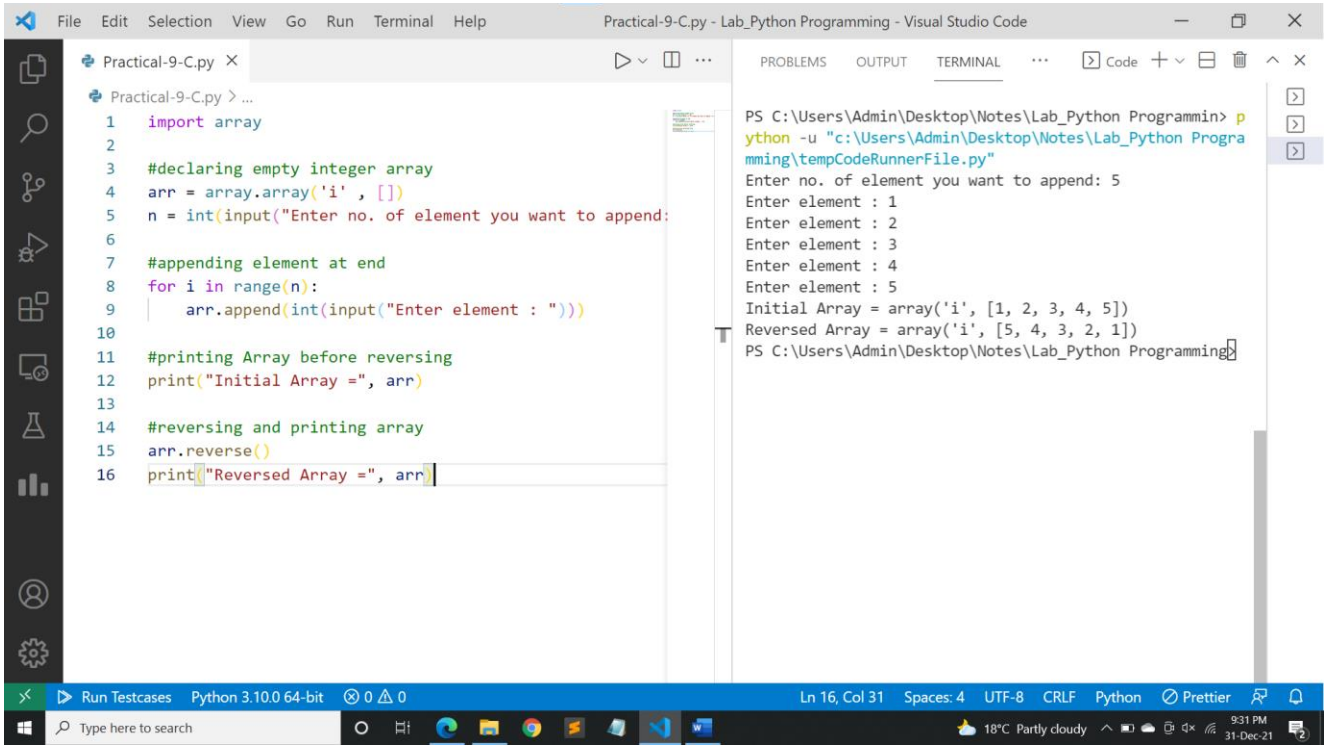
```
import array

#declaring empty integer array
arr = array.array('i' , [])
n = int(input("Enter no. of element you want to append: "))

#appending element at end
for i in range(n):
    arr.append(int(input("Enter element : ")))
```

```
#printing Array before reversing
print("Initial Array =", arr)

#reversing and printing array
arr.reverse()
print("Reversed Array =", arr)
```

Output:

```
Enter no. of element you want to append: 5
Enter element : 1
Enter element : 2
Enter element : 3
Enter element : 4
Enter element : 5
Initial Array = array('i', [1, 2, 3, 4, 5])
Reversed Array = array('i', [5, 4, 3, 2, 1])
```

Screenshot:



d. Write a Python program to insert a new item before the second element in an existing array.

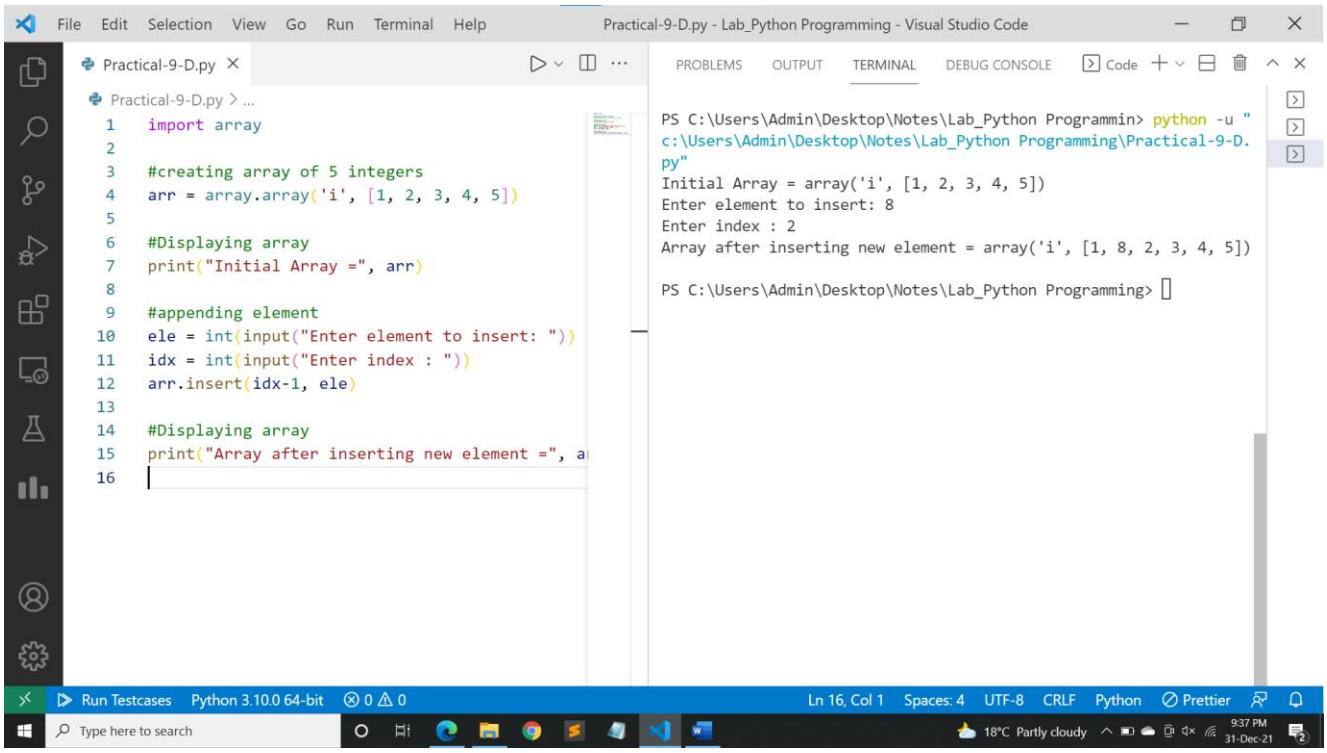
Program:

```
import array

#creating array of 5 integers
arr = array.array('i', [1, 2, 3, 4, 5])

#Displaying array
print("Initial Array =", arr)

#appending element
ele = int(input("Enter element to insert: "))
idx = int(input("Enter index : "))
arr.insert(idx-1, ele)

#Displaying array
print("Array after inserting new element =", arr)
```

Output:

```
Initial Array = array('i', [1, 2, 3, 4, 5])
Enter element to insert: 8
Enter index : 2
Array after inserting new element = array('i', [1, 8, 2, 3, 4, 5])
```

Screenshot:



e. Write a program to create a square matrix and print it in spiral form

Program:

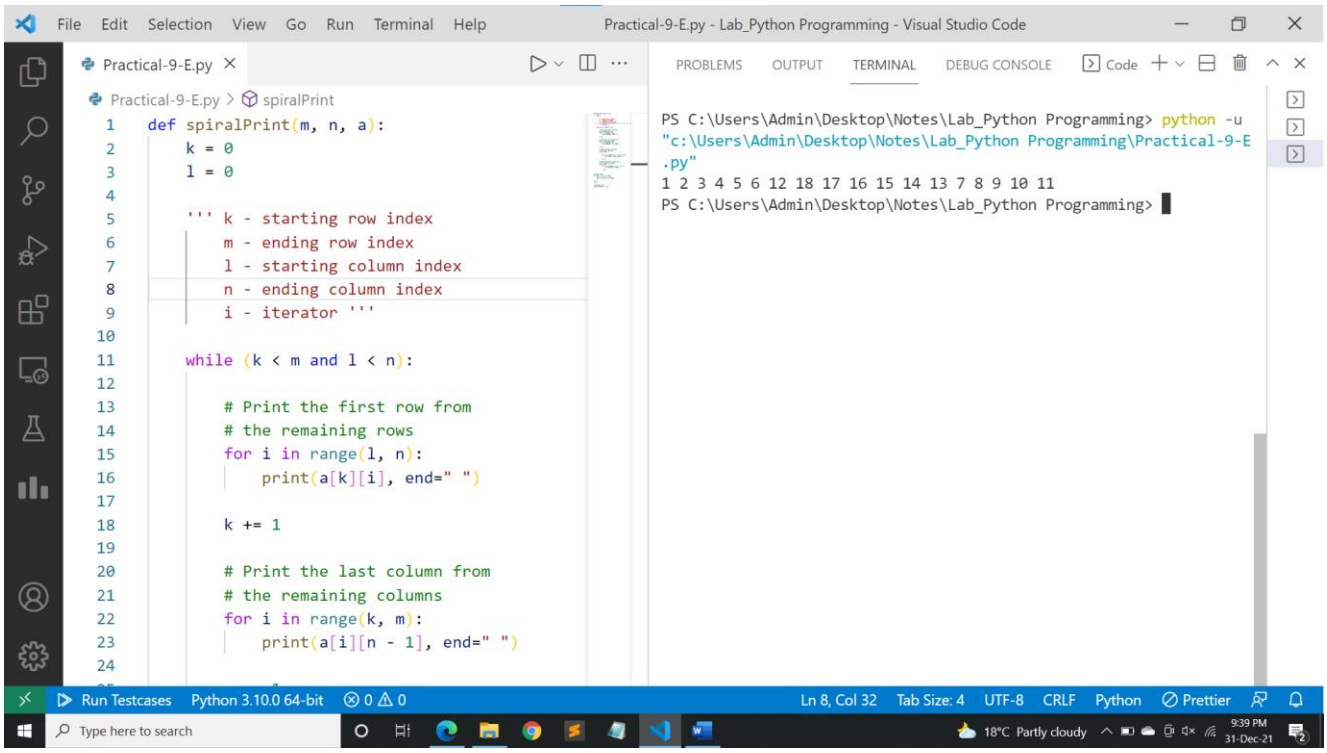
```
def spiralPrint(m, n, a):
    k = 0
    l = 0

    ''' k - starting row index
        m - ending row index
        l - starting column index
        n - ending column index
        i - iterator '''

    while (k < m and l < n):

        # Print the first row from
        # the remaining rows
        for i in range(l, n):
            print(a[k][i], end=" ")

        k += 1

        # Print the last column from
        # the remaining columns
        for i in range(k, m):
            print(a[i][n - 1], end=" ")
```

```
        n -= 1

        # Print the last row from
        # the remaining rows
        if (k < m):

            for i in range(n - 1, (l - 1), -1):
                print(a[m - 1][i], end=" ")

            m -= 1

        # Print the first column from
        # the remaining columns
        if (l < n):
            for i in range(m - 1, k - 1, -1):
                print(a[i][l], end=" ")

            l += 1


# Driver Code
a = [[1, 2, 3, 4, 5, 6],
    [7, 8, 9, 10, 11, 12],
    [13, 14, 15, 16, 17, 18]]

R = 3
C = 6

# Function Call
spiralPrint(R, C, a)
```

Output:

```
1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11
```

Screenshot:



Result: I have studied Array in Python and successfully performed practical-9.