lab-12

LAB 5: Computing the inner product and orthogonality

5.1 Objectives:

Use python

1. to compute the inner product of two vectors.
2. to check whether the given vectors are orthogonal.

5.2 Inner Product of two vectors

Find the inner product of the vectors $(2, 1, 5, 4)$ and $(3, 4, 7, 8)$.

```
import numpy as np

#initialize arrays
A = np.array([2, 1, 5, 4])
B = np.array([3, 4, 7, 8])

#dot product
output = np.dot(A, B)

print(output)
```

5.3 Checking orthogonality

Verify whether the following vectors $(2, 1, 5, 4)$ and $(3, 4, 7, 8)$ are orthogonal.

```
import numpy as np

#initialize arrays
A = np.array([2, 1, 5, 4])
B = np.array([3, 4, 7, 8])

#dot product
output = np.dot(A, B)
print('Inner product is :',output)
if output==0:
  print('given vectors are orthognal ')
else:
  print('given vectors are not orthognal ')
```

```
Inner product is : 77
given vectors are not orthognal
```