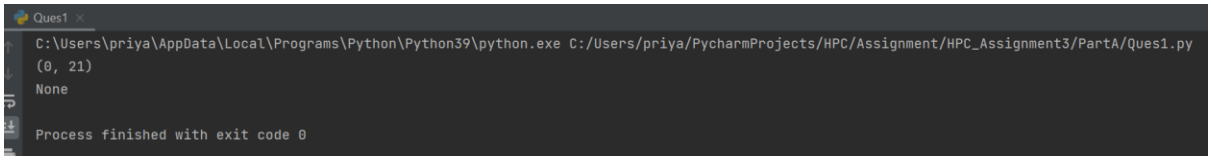
PART-A

Question 1-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/0cd6bf08e7638a5fa257d2c3f6c3368343fc49af/Ques1.py

OUTPUT:



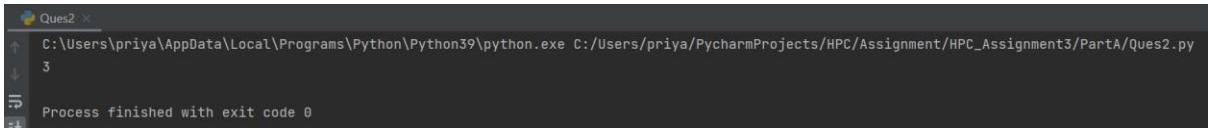
Since we are iterating the given array only once, the time complexity of the program comes out to be **O(n)**.

Question 2-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/1655c7067b583db7f43087c5da3a179d6c88d2ff/Ques2.py

OUTPUT:



Question 3-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/1655c7067b583db7f43087c5da3a179d6c88d2ff/Ques3.py

OUTPUT:

For Input: (2 -> 4 -> 3) + (5 -> 6 -> 4)

Output: 7 -> 0 -> 8

Question 4-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/1655c7067b583db7f43087c5da3a179d6c88d2ff/Ques4.py

OUTPUT:

For s = "abcabcbb" ; The answer is "abc", with the length of 3.

```
Ques4
C:\Users\priya\AppData\Local\Programs\Python\Python39\python.exe C:/Users/priya/PycharmProjects/HPC/Assignment/HPC_Assignment3/PartA/Ques4.py
3

Process finished with exit code 0
```

Question 5-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/1655c7067b583db7f43087c5da3a179d6c88d2ff/Ques5.py

OUTPUT:

```
Ques5
C:\Users\priya\AppData\Local\Programs\Python\Python39\python.exe C:/Users/priya/PycharmProjects/HPC/Assignment/HPC_Assignment3/PartA/Ques5.py
a = [4 3 2 1]
b = [2 3 4 1]
Addition= [6 6 6 2]
Division = [2.  1.  0.5 1. ]
Subtraction = [ 2  0 -2  0]
Multiplication = [8 9 8 1]
a =
[[1 8 6 7]
 [1 3 9 6]
 [6 8 4 4]
 [8 4 5 6]]
b =
[[8 4 9 6]
 [7 4 2 6]
 [6 9 5 6]
 [5 8 3 4]]
Addition=
[[ 9 12 15 13]
 [ 8  7 11 12]
 [12 17  9 10]
 [13 12  8 10]]
Division =
[[0.125      2.         0.66666667 1.16666667]
 [0.14285714 0.75       4.5        1.        ]
 [1.         0.88888889 0.8        0.66666667]
 [1.6        0.5        1.66666667 1.5       ]]
Subtraction =
[[-7  4 -3  1]
 [-6 -1  7  0]
 [ 0 -1 -1 -2]
 [ 3 -4  2  2]]
Multiplication =
[[ 8 32 54 42]
 [ 7 12 18 36]
 [36 72 20 24]
 [40 32 15 24]]

Process finished with exit code 0
```

Question 6-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/1655c7067b583db7f43087c5da3a179d6c88d2ff/Ques6.py

OUTPUT:

Question 7-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/0e233704c5504a7a23143e65f28bdbef62241825/Ques7.py

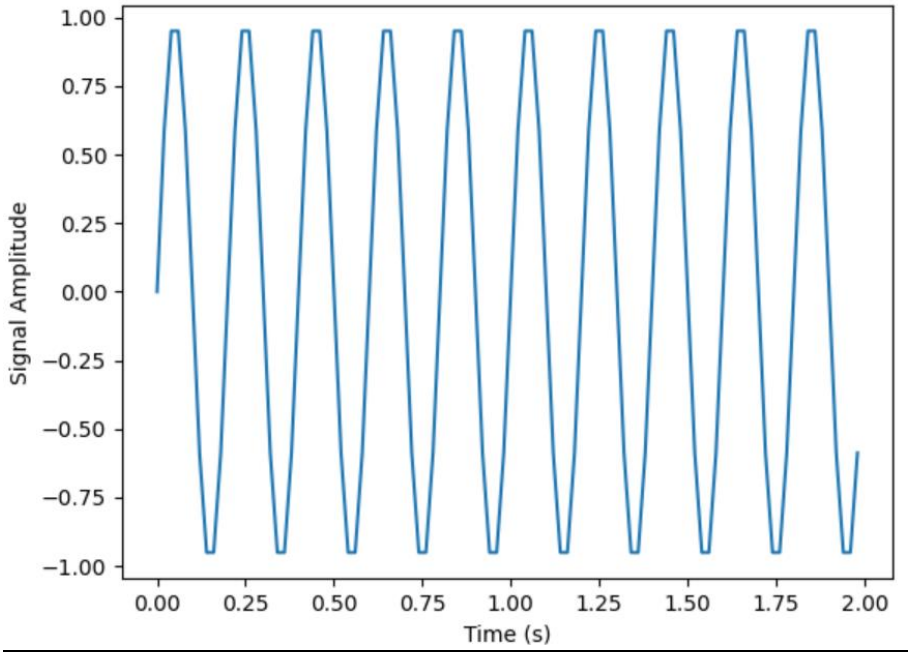
OUTPUT:

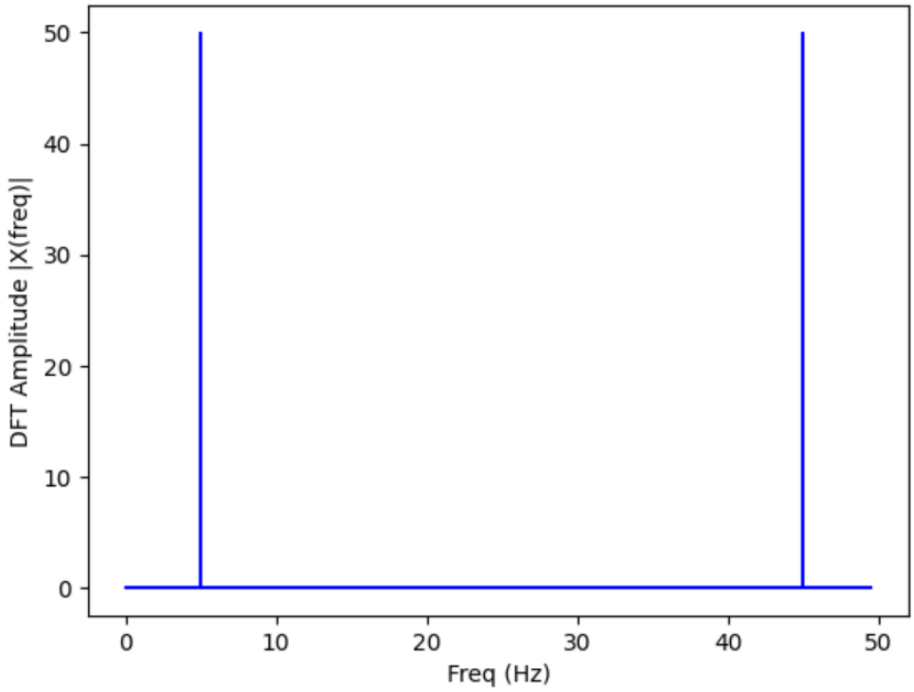
Question 8-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/b61aa0e0d8e579c54c9dd7670df4f9da96ffa3b5/Ques8.py

OUTPUT:



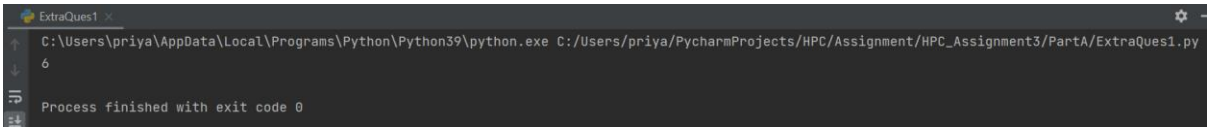


Extra Question 1-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/1655c7067b583db7f43087c5da3a179d6c88d2ff/ExtraQues1.py

OUTPUT:

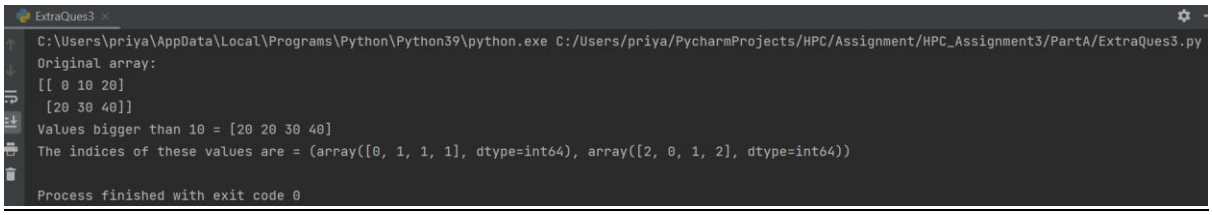


Extra Question 3-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/1655c7067b583db7f43087c5da3a179d6c88d2ff/ExtraQues3.py

OUTPUT:

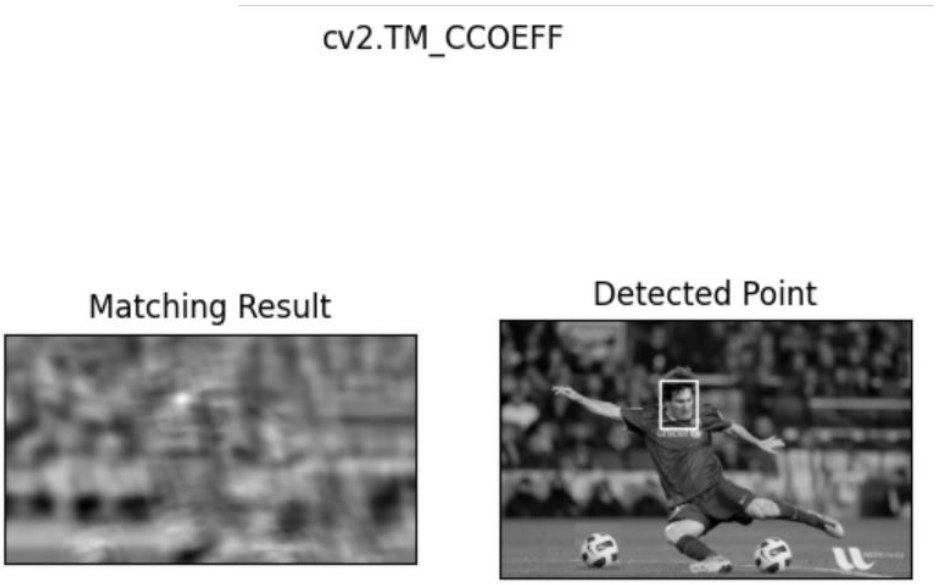


Extra Question 4-

CODE:

https://github.com/priyanshurawat1509/Homework3/blob/0cd6bf08e7638a5fa257d2c3f6c3368343fc49af/ExtraQues4.py

OUTPUT:



cv2.TM_CCOEFF_NORMED

Matching Result

Detected Point

cv2.TM_CCORR

Matching Result

Detected Point

cv2.TM_CCORR_NORMED

Matching Result

Detected Point

cv2.TM_SQDIFF

Matching Result

Detected Point

cv2.TM_SQDIFF_NORMED

Matching Result

Detected Point

PART-B

Ques 1 &2 - Attached In ZIP Files