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SE-4-D

EXPERIMENT N0-11

Write a program to perform following operations using numpy

a) Create a 6x6 matrix and fill it with a checkerboard pattern
[[0 1 0 1 0 1]

.....

[0 1 0 1 0 1]

[1 0 1 0 1 0]]

b) Create the following pattern without hardcoding. Use only numpy functions and the below input array

Input: a = np.array([1,2,3])

Desired Output:

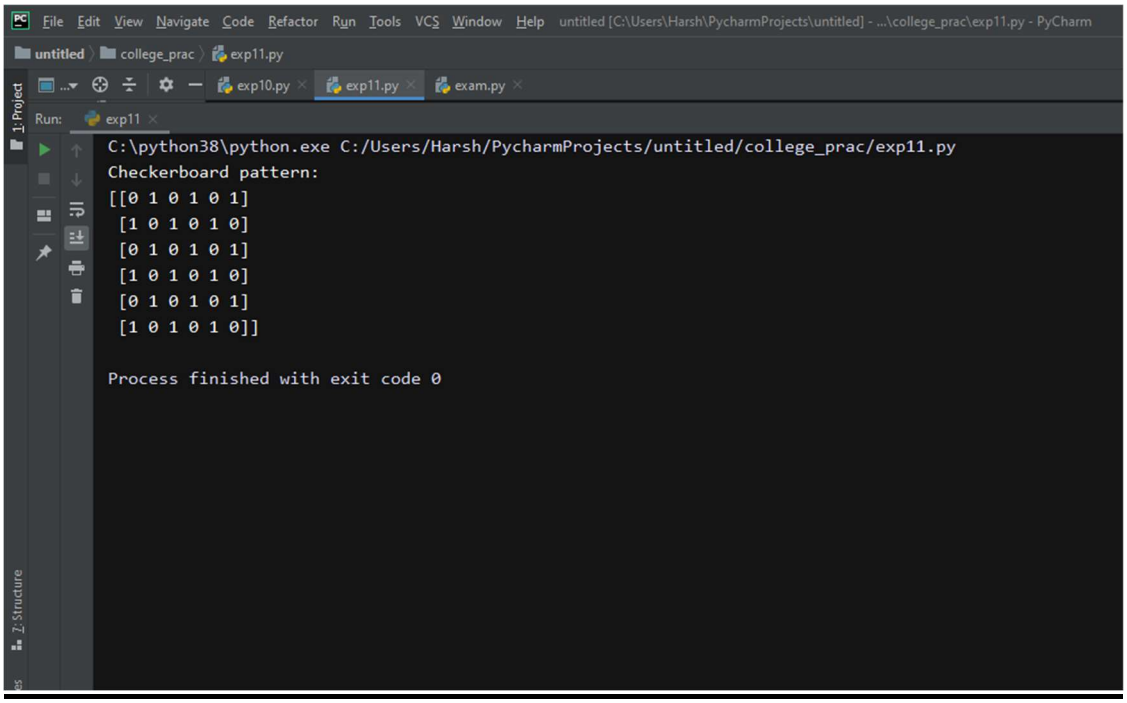
array([1, 1, 1, 1, 2, 2, 2, 2, 3, 3, 3, 3, 1, 2, 3, 1, 2, 3, 1, 2, 3])

c) Add, subtract, multiply and divide two matrices.

A- SOURCE CODE :-

```
import numpy as np
x = np.ones((3,3))
print("Checkerboard pattern:")
x = np.zeros((6,6),dtype=int)
x[1::2,::2] = 1
x[::2,1::2] = 1
print(x)
```

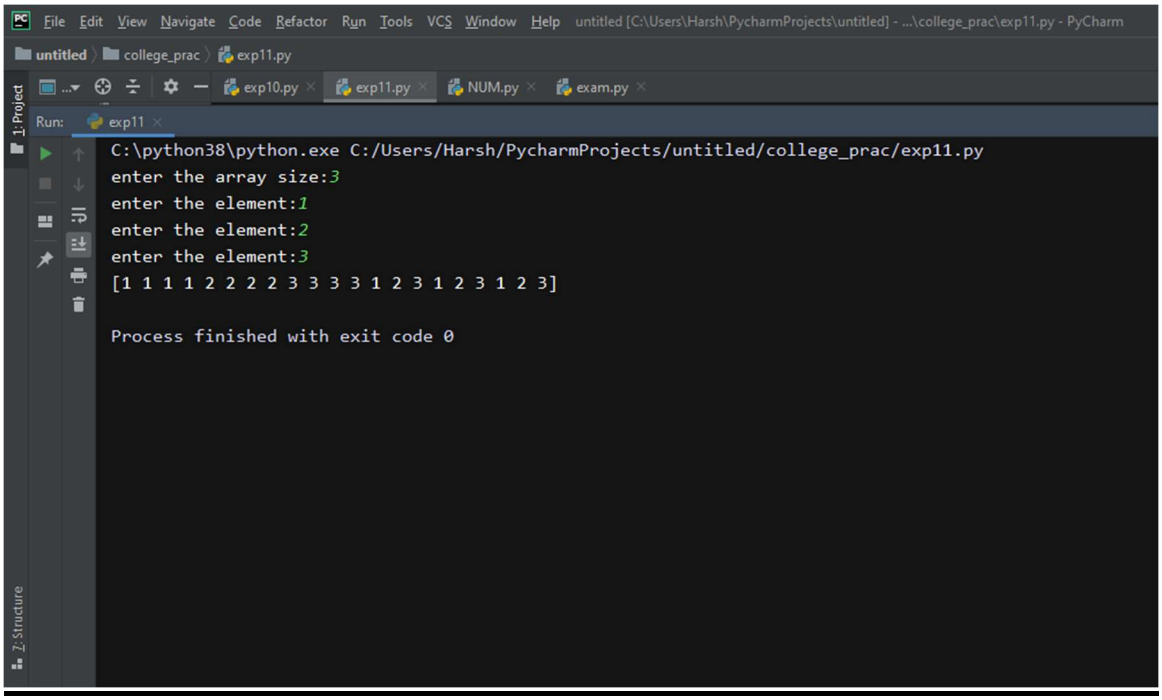
OUTPUT:



B- SOURCE CODE :-

```
from numpy import *
n1=int(input("enter the array size:"))
x1=zeros(n1,dtype=int)
u=len(x1)
i=0
while i<u:
x=int(input("enter the element:"))
x1[i]=x
i+=1
hstack((repeat(x1, 4),tile(x1, 3)))
print(r_[(repeat(x1, 4), tile(x1, 3))])
```

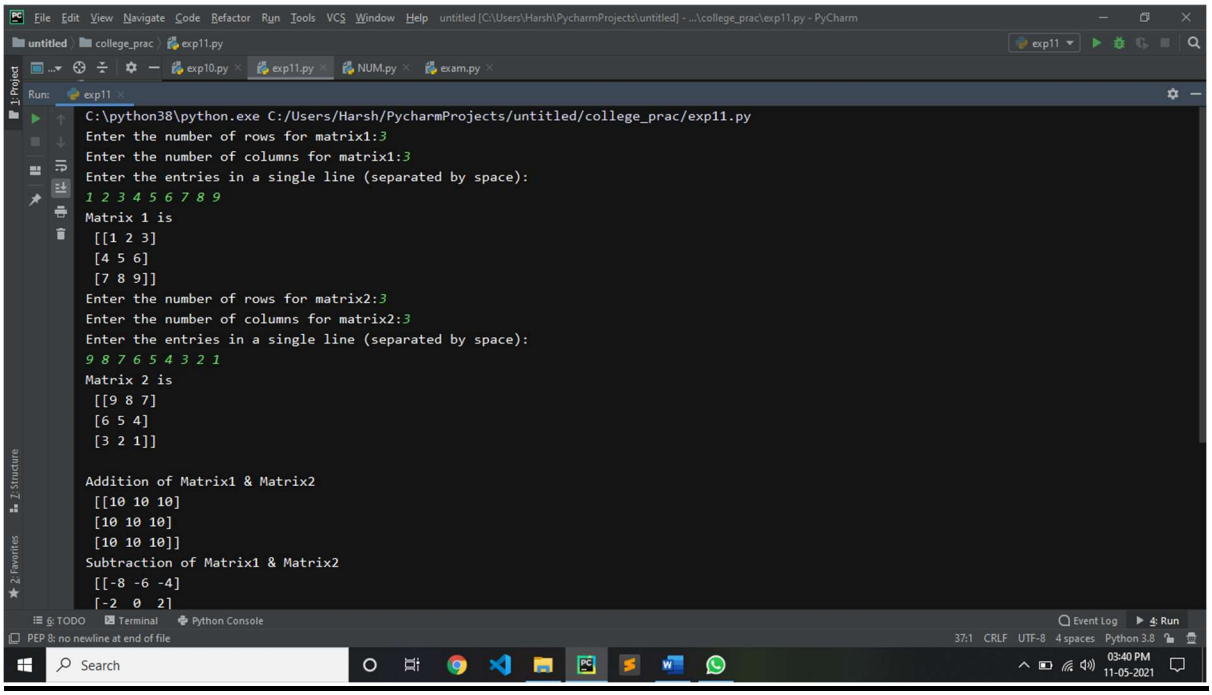
OUTPUT:

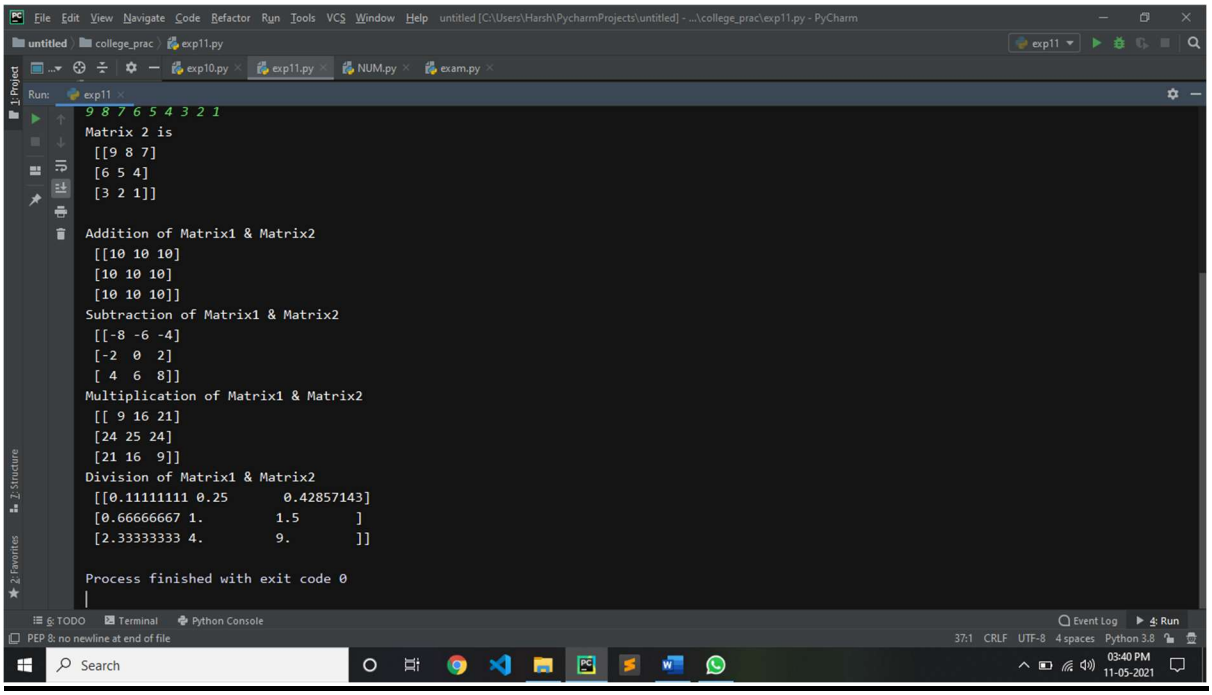


C- SOURCE CODE :-

```
Import numpy as np

R = int(input("Enter the number of rows for matrix1:"))
C = int(input("Enter the number of columns for matrix1:"))
print("Enter the entries in a single line (separated by space): ")
entries = list(map(int, input().split()))
matrix1 = np.array(entries).reshape(R, C)
print('Matrix 1 is\n',matrix1)

D = int(input("Enter the number of rows for matrix2:"))
F = int(input("Enter the number of columns for matrix2:"))
print("Enter the entries in a single line (separated by space): ")
entries = list(map(int, input().split()))
matrix2 = np.array(entries).reshape(D, F)
print('Matrix 2 is\n',matrix2,'\n')

print ('Addition of Matrix1 & Matrix2\n',np.add(matrix1,matrix2))
print ('Subtraction of Matrix1 & Matrix2\n',np.subtract(matrix1,matrix2))
print ('Multiplication of Matrix1 & Matrix2\n',np.multiply(matrix1,matrix2))
print ('Division of Matrix1 & Matrix2\n',np.divide(matrix1,matrix2))
```

OUTPUT:


C:\python38\python.exe C:/Users/Harsh/PycharmProjects/untitled/college_prac/exp11.py
Enter the number of rows for matrix1:3
Enter the number of columns for matrix1:3
Enter the entries in a single line (separated by space):
1 2 3 4 5 6 7 8 9
Matrix 1 is
[[1 2 3]
[4 5 6]
[7 8 9]]
Enter the number of rows for matrix2:3
Enter the number of columns for matrix2:3
Enter the entries in a single line (separated by space):
9 8 7 6 5 4 3 2 1
Matrix 2 is
[[9 8 7]
[6 5 4]
[3 2 1]]
Addition of Matrix1 & Matrix2
[[10 10 10]
[10 10 10]
[10 10 10]]
Subtraction of Matrix1 & Matrix2
[[-8 -6 -4]
[-2 0 2]


9 8 7 6 5 4 3 2 1
Matrix 2 is
[[9 8 7]
[6 5 4]
[3 2 1]]
Addition of Matrix1 & Matrix2
[[10 10 10]
[10 10 10]
[10 10 10]]
Subtraction of Matrix1 & Matrix2
[[-8 -6 -4]
[-2 0 2]
[4 6 8]]
Multiplication of Matrix1 & Matrix2
[[9 16 21]
[24 25 24]
[21 16 9]]
Division of Matrix1 & Matrix2
[[0.11111111 0.25 0.42857143]
[0.66666667 1. 1.5]
[2.33333333 4. 9.]]
Process finished with exit code 0