Practical no. – 3

Aim: Write a program to do the following:

1. Enter a vector u as a n-list
2. Enter another vector v as a n-list
3. Find the vector for different values of a and b

Code:

```
def add(u,v,a,b) : return[a*u[i] + b*v[i] for i in range(len(u))]
u = [1,2,3,4]
v = [4,5,6,7]

a = 2
b = 4

c = add(u,v,a,b)
print(c)
```

Output:

```
[18, 24, 30, 36]
```

OR

Code:

```
def vectors(length, name):
    vec = []
    for i in range(length):
        vec.append(int(input(f"Enter {i+1}{suffix(i+1)} value of
        vector {name}: ")))
    return vec

    # as it does not create more logical approach
    # vec=[int(input(f"Enter {i+1}{suffix(i+1)} value of {name}:
    ")) for i in range(length)]

# extra ;)
def suffix(i):
    if i in (11,12,13):
        suf = "th"
    else:
```

```
            suf = {1:"st",2:"nd",3:"rd"}.get(i%10,"th")
        return suf

    def add():
        len = int(input("Enter the length of vectors: "))
        u = vectors(len,"u")
        print()
        v = vectors(len,"v")

        a = int(input("\nEnter the value of a: "))
        b = int(input("Enter the value of b: "))

        resultVec = []
        for i in range(len):
            resultVec.append(a*u[i] + b*v[i])
        return u,v,resultVec

    print("Performing ((a*u) + (b*v))")
    u,v,result = add()
    print(f"\nResultant of {u} and {v} is {result}")
```

Output:

```
Performing ((a*u) + (b*v))
Enter the length of vectors: 2
Enter 1st value of vector u: 2
Enter 2nd value of vector u: 3

Enter 1st value of vector v: 4
Enter 2nd value of vector v: 5

Enter the value of a: 2
Enter the value of b: 7

Resultant of [2, 3] and [4, 5] is [32, 41]
```

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1. Enter a vector u as a n-list
2. Enter another vector v as a n-list
3. Find the dot product of u and v

Code:

```
def dotProduct(a,b): return sum([a[i] * b[i] for i in
range(len(a))])
a = [1,2]
b = [3,4]

print(dotProduct(a,b))
```

Output:

```
11
```

OR

Code:

```
def vector(length,name):
    vec = []
    for i in range(length):
        vec.append(int(input(f"Enter {i+1}{suffix(i+1)} value of
        vector {name}: ")))
    return vec

def suffix(i):
    if i in (11,12,13):
        suf = "th"
    else:
        suf = {1:"st",2:"nd",3:"rd"}.get(i%10,"th")
    return suf

def dotProduct():
    len = int(input("Enter the length of vector: "))
    a = vector(len,"a")
    print()
    b = vector(len,"b")

    result = 0
    for i in range(len):
        result += a[i]*b[i]
```

```
    return a,b,result

resultant = dotProduct()
q,r,s = resultant
print(f"Dot product of {q} and {r} is {s}")
```

Output:

```
Enter the length of vector: 2
Enter 1st value of vector a: 1
Enter 2nd value of vector a: 2

Enter 1st value of vector b: 3
Enter 2nd value of vector b: 4
Dot product of [1, 2] and [3, 4] is 11
```
