

ASSIGNMENT NO 3 -APPLICATION OF PYTHON IN TRANSPORTATION ENGINEERING

Q-1

```
#To Calculate the length of transition curve
V= int(input("Enter the value of design speed:"))
R= int(input("Enter the value of Radius of curvature:"))
N= int(input("Enter the value of slope:"))
W= float(input("Enter the value of width of road including extra widening:"))
emax= float(input("enter the value for plain terrain:"))
ecal=(V*V/(225*R))
print("The value of Super elevation:",ecal)
if ecal<emax:
    print(ecal)
else:
    print(emax)
Ls=(emax*N*W/2)
print("The length of transition curve:", Ls)
```

```
Enter the value of design speed:65
Enter the value of Radius of curvature:220
Enter the value of slope:150
Enter the value of width of road including extra widening:7.5
enter the value for plain terrain:0.07
The value of Super elevation: 0.08535353535353535
0.07
The length of transition curve: 39.37500000000001
```

Q-2

```
R = int(input("Constant R:"))
C = int(input("Constant C:"))
import numpy as geek
A = int(input("Total Data Values for EWL Constant:"))
B = int(input("Total Data Values for AADT: "))
EWL_Constant =[]
AADT =[]
for i in range(1,A+1):
    print("Enter EWL Constant:")
    A = float(input())
    EWL_Constant.append(A)
for j in range(1,B+1):
    print("Enter AADT:")
    B = float(input())
    AADT.append(B)
product=geek.dot(EWL_Constant,AADT)
print("Dot Product:\n", product)
Total_EWL = product
print("Total EWL:", Total_EWL)
print("EWL after 60 years:",Total_EWL*1.6)
TI = 1.35*(((1.6*Total_EWL)+((product)/2))*0.11)
print("Traffic Index : ", TI)
Thickness = 0.166*TI*(99-R)/(C**0.2)
print ("Pavement Thickness: ", Thickness, "cm")
```

```
Constant R:48
Constant C:16
Total Data Values for EWL Constant:4
Total Data Values for AADT: 4
Enter EWL Constant:
330
Enter EWL Constant:
1070
Enter EWL Constant:
2460
Enter EWL Constant:
4620
Enter AADT:
3750
Enter AADT:
470
Enter AADT:
320
Enter AADT:
120
Dot Product:
3082000.0
Total EWL: 3082000.0
EWL after 60 years: 4931200.0
Traffic Index : 7.577910657490486
Pavement Thickness: 36.847136933326986 cm
```

```

P=float (input(" Load in kg: "))
p=float (input(" Tyre pressure kg/cm^2: "))
M = int (input("Total Number of layers in a given Pavement : "))
pi = 3.14159
CBR = []
for i in range (1, M+1):
    print("California Bearing Ratio of Material in %")
    CBR_value = float(input())
    CBR.append(CBR_value)
T = ((1.75*P)/(CBR_value)-(P/(p*pi)))*0.5
print("Thickness Above this layer: ", T, "cm")
print("Given that bitumen layer of 4 cm")

```

```

↳ Load in kg: 4085
   Tyre pressure kg/cm^2: 7
   Total Number of layers in a given Pavement : 3
   California Bearing Ratio of Material in %
   California Bearing Ratio of Material in %
   California Bearing Ratio of Material in %
   4.38
   Thickness Above this layer:  38.031276487723645 cm
   Given that bitumen layer of 4 cm

```