**NEWTON BACKWORD INTERPOLATION :**

**CODE:**

**n = int(input("enter number of elements: "))**

**x,y=[],[]**

**for i in range(0,n):**

**x.append(float(input("enter elements of x: ")))**

**y.append(float(input("enter elements of y :")))**

**b =[]**

**b.append(y)**

**for i in range(0,n-1):**

**a = []**

**for j in range(1,n):**

**a.append(y[j]-y[j-1])**

**b.append(a)**

**n-=1**

**y=a**

**print(b)**

**print("+=+=+=+=+=+formula-part=+=+=+=+=+")**

**m = len(x)**

**value = float(input("y(x) : enter x: "))**

**p = (value - x[-1])/(x[1]-x[0])**

**temp = 1**

**Temp = []**

**import math**

**for k in range(0,m-1):**

**temp = temp \* (p+k)**

**Temp.append(temp)**

**Q = b[0][-1]**

**for l in range(0,m-1):**

**Q = Q + ((Temp[l]\*b[l+1][-1])/(math.factorial(l+1)))**

**print(f"the value of f({value}) is {Q}")**

**OUTPUT:**

**enter number of elements: 5**

**enter elements of x: 1**

**enter elements of y :1**

**enter elements of x: 3**

**enter elements of y :27**

**enter elements of x: 5**

**enter elements of y :125**

**enter elements of x: 7**

**enter elements of y :343**

**enter elements of x: 9**

**enter elements of y :729**

**[[1.0, 27.0, 125.0, 343.0, 729.0], [26.0, 98.0, 218.0, 386.0], [72.0, 120.0, 168.0], [48.0, 48.0], [0.0]]**

**+=+=+=+=+=+formula-part=+=+=+=+=+**

**y(x) : enter x: 8**

**the value of f(8.0) is 512.0**