**DIVIDED DIFFERENCE FORMULA:**

**CODE:**

**x = []**

**f\_x = []**

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

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

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

**f\_x.append(int(input(" enter elements of f\_x: ")))**

**b = []**

**b.append(f\_x)**

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

**a = []**

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

**a.append((f\_x[j] - f\_x[j-1])/(x[j+i]-x[j-1]))**

**b.append(a)**

**n -=1**

**f\_x = a**

**print(b**

**)**

**print("::::::::::: formula part :::::::::::")**

**m = len(x)**

**Temp = []**

**value = int(input("f(x) : enter value of x: "))**

**def fa(c,x):**

**temp = 1**

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

**temp = temp \* (c - x[i])**

**Temp.append(temp)**

**return Temp**

**l = fa(value,x)**

**umair = 0**

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

**umair = umair + ((l[i]\*b[i+1][0]))**

**umair = umair + b[0][0]**

**print("f",(value), "=" ,umair, )**

**OUTPUT:**

**enter total number of elements: 5**

**enter elements of x: 1**

**enter elements of f\_x: 1**

**enter elements of x: 3**

**enter elements of f\_x: 27**

**enter elements of x: 5**

**enter elements of f\_x: 125**

**enter elements of x: 7**

**enter elements of f\_x: 343**

**enter elements of x: 9**

**enter elements of f\_x: 729**

**[[1, 27, 125, 343, 729], [13.0, 49.0, 109.0, 193.0], [9.0, 15.0, 21.0], [1.0, 1.0], [0.0]]**

**::::::::::: formula part :::::::::::**

**f(x) : enter value of x: 2**

**f 2 = 8.0**