PROGRAM:

class Node:

def \_\_init\_\_(self,coeff,pow):

self.coeff=coeff

self.pow=pow

self.next=None

class Polynomial:

def \_\_init\_\_(self):

self.head=None

def append(self,coeff,pow):

new\_node=Node(coeff,pow)

if self.head is None:

self.head=new\_node

else:

temp=self.head

while temp.next:

temp=temp.next

temp.next=new\_node

def printPolynomial(self):

temp=self.head

result=[]

while temp:

result.append(f"{temp.coeff}x^{temp.pow}")

temp=temp.next

print("+".join(result))

def addPolynomial(self,p1,p2):

a=p1

b=p2

newHead=Node(0,0)

c=newHead

while a is not None or b is not None:

if a is None:

c.next=b

break

elif b is None:

c.next=a

break

elif a.pow==b.pow:

c.next=Node(a.coeff+b.coeff,a.pow)

a=a.next

b=b.next

elif a.pow>b.pow:

c.next=Node(a.coeff,a.pow)

a=a.next

else:

c.next=Node(b.coeff,b.pow)

b=b.next

c=c.next

return newHead.next

poly1=Polynomial()

poly1.append(5,3)

poly1.append(4,2)

poly1.append(2,0)

poly2=Polynomial()

poly2.append(5,1)

poly2.append(5,0)

print("First Polynomial:")

poly1.printPolynomial()

print("Second Polynomial:")

poly2.printPolynomial()

result=Polynomial()

result.head=result.addPolynomial(poly1.head,poly2.head)

print("Resultant Polynomial:")

result.printPolynomial()

OUTPUT:

First Polynomial:

5x^3+4x^2+2x^0

Second Polynomial:

5x^1+5x^0

Resultant Polynomial:

5x^3+4x^2+5x^1+7x^0