package sample2;

import java.util.Scanner;

public class Sample2 {

public static void main(String[] args)

Scanner scan1= new Scanner (System.in);

int insertion, mismatch, match, deletion;

int n,m;

String s1,s2;

System.out.println("Please enter the Insertion/Deletion value: ");

insertion= scan1.nextInt();

deletion = insertion;

System.out.println("Please enter the Mismatch value: ");

mismatch= scan1.nextInt();

System.out.println("Please enter the Match value: ");

match= scan1.nextInt();

System.out.println("Please enter the fist sequence: ");

s1= scan1.next();

System.out.println("Please enter the second sequence: ");

s2= scan1.next();

m = s1.length()+1;

n = s2.length()+1;

int Array2D[][] = new int [s1.length()+1][s2.length()+1];

for (int i=0; i<=s1.length(); i++)

{

for (int j=0; j<=s2.length(); j++)

{

if (i==0 && j==0)

{

Array2D[i][j]=0;

}

else if (i==0)

{

Array2D[i][j]=Array2D[i][j-1] + deletion;

}

else if (j==0)

{

Array2D[i][j]=Array2D[i-1][j] + insertion;

}

else // fill all cells by zero (Optional)

{

Array2D[i][j]=0;

}

}

}

for (int i=1; i<=s1.length(); i++ )

{

for (int j=1; j<=s2.length(); j++ )

{

if (s1.charAt(i-1) == s2.charAt(j-1))

{

Array2D[i][j] = Array2D[i-1][j-1] + match;

}

else if (s1.charAt(i-1) != s2.charAt(j-1))

{

if ((Array2D[i-1][j-1] >= Array2D[i-1][j]) && (Array2D[i-1][j-1] >= Array2D[i][j-1]))

{

Array2D[i][j] = Array2D[i-1][j-1] + mismatch;

}

else if ((Array2D[i-1][j] > Array2D[i-1][j-1]) && (Array2D[i-1][j] > Array2D[i][j-1]))

{

Array2D[i][j] = Array2D[i-1][j] + insertion;

}

else if ((Array2D[i][j-1] > Array2D[i-1][j-1]) && (Array2D[i][j-1] > Array2D[i-1][j]))

{

Array2D[i][j] = Array2D[i][j-1] + deletion;

}

}

}

}

System.out.println("-------------------------------");

for(int i=0; i<s1.length()+1; i++)

{

for(int j=0; j<s2.length()+1; j++)

System.out.printf( "%5d",Array2D[i][j]);

System.out.println();

}

//----------------------------------- Array2D is Built and Filled out --------------------------------

int s1index= s1.length()-1;

int s2index= s2.length()-1;

char s1\_arr[];

char s2\_arr[];

int num\_arr[];

int last=0;

int i= s1.length();

int j= s2.length();

if (s1.length() >= s2.length())

{

s1\_arr = new char [s1.length()];

s2\_arr = new char [s1.length()];

num\_arr = new int [s1.length()];

last=s1.length()-1;

}

else

{

s1\_arr = new char [s2.length()];

s2\_arr = new char [s2.length()];

num\_arr = new int [s2.length()];

last=s2.length()-1;

}

while ((i != 0) && (j != 0))

{

if (s1.charAt(s1index) == s2.charAt(s2index))

{

s1\_arr[last]= s1.charAt(s1index);

s2\_arr[last]= s2.charAt(s2index);

num\_arr[last]= match;

last= last-1;

s1index = s1index-1;

s2index = s2index-1;

i=i-1;

j=j-1;

}

else

{

if ((Array2D[i-1][j-1] > Array2D[i-1][j]) && (Array2D[i-1][j-1] > Array2D[i][j-1]))

{

s1\_arr[last]= s1.charAt(s1index);

s2\_arr[last]= s2.charAt(s2index);

num\_arr[last]= mismatch;

last= last-1;

s1index = s1index-1;

s2index = s2index-1;

i=i-1;

j=j-1;

}

else if ( (Array2D[i][j-1] > Array2D[i-1][j])) //(Array2D[i][j-1] > Array2D[i-1][j-1]) &&

{

s1\_arr[last]= '-';

s2\_arr[last]= s2.charAt(s2index);

num\_arr[last]= insertion;

last= last-1;

s2index = s2index-1;

j=j-1;

}

else //if ((Array2D[i-1][j] > Array2D[i-1][j-1]) && (Array2D[i-1][j] > Array2D[i][j-1]))

{

s1\_arr[last]= s1.charAt(s1index);

s2\_arr[last]= '-';

num\_arr[last]= deletion;

last= last-1;

s1index = s1index-1;

i=i-1;

}

}

}

System.out.println("===============================");

for (int q=0; q<s1\_arr.length; q++)

{

System.out.print(" "+s1\_arr[q]);

}

System.out.println();

for (int q=0; q<s1\_arr.length; q++)

{

System.out.print(" "+s2\_arr[q]);

}

System.out.println();

for (int q=0; q<s1\_arr.length; q++)

{

System.out.printf("%3d",num\_arr[q]);

}

System.out.println();

int score=0;

for (int q=0; q<s1\_arr.length; q++)

{

score= score+ num\_arr[q];

}

System.out.println("===================================");

System.out.println("The score is : "+ score);

System.out.println();

}

}