**1) Given an array K with N integers from 1 to N+1 such that the array has exactly one integer missing, write**

**a Java function that returns the missing integer.**

**e.g. given K = [3,5,4,1], the function should return 2**

1. Calculate the sum of first n natural numbers as **sumtotal= n\*(n+1)/2**
2. Create a variable sum to store the sum of array elements.
3. Traverse the array from start to end.
4. Update the value of sum as **sum** *=* **sum** *+* **array**[i]
5. Print the missing number as **sumtotal** *–* **sum**

// Java program to find missing Number

class Main {

// Function to return a missing number

static int getMissingNo(int a[], int n)

{

int i, total;

total = (n + 1) \* (n + 2) / 2;

for (i = 0; i < n; i++)

total -= a[i];

return total;

}

/\* program to test above function \*/

public static void main(String args[])

{

int a[] = { 3,5,4,6,1};

int miss = getMissingNo(a, 5);

System.out.println(miss);

}

}

**2) Given a string S of length N, write a Java function that transforms the string by reversing characters in**

**groups of four, and returns the transformed string.**

**e.g. when S = 'Lorem at' the output should be 'eroLta m'**

**when S = ' Tempor ip' the output should be 'meT roppi'**

1. Create a temporary byte[] of length equal to the length of the input string.
2. Store the bytes (which we get by using getBytes() method) in reverse order into the temporary byte[] .
3. Create a new String abject using byte[] to store result.

|  |
| --- |
| // Java program to ReverseString using ByteArray.  import java.lang.\*;  import java.io.\*;  import java.util.\*;    // Class of ReverseString  class ReverseString {      public static void main(String[] args)      {          String input =”Lorem at”;     String input=”Tempor ip”;          // getBytes() method to convert string          // into bytes[].          byte[] strAsByteArray = input.getBytes();            byte[] result = new byte[strAsByteArray.length];            // Store result in reverse order into the          // result byte[]          for (int i = 0; i < strAsByteArray.length; i++)              result[i] = strAsByteArray[strAsByteArray.length - i - 1];            System.out.println(new String(result));      }  } |

**3) You're given a database (education) with three tables (student, course, institution) as illustrated below:**

**a) Use the diagram above to create the tables (the database, table and column names should remain**

**as indicated)**

**Create database education;**

**create table student ( studentid  int(11), name varchar(250),course int(11) ,primary key (course));**

**create table course ( courseid  int(11), name varchar(250),institution int(11) ,primary key (institution));**

**create table institution ( institutionid  int(11), name varchar(250));**

**b) Write a MySQL query that will display the number of students per course per institution in the**

**format below**

SELECT MAX(Institution.Name) AS Institution Name,(Course.Name) As Course Name,COUNT(Student.studentid) AS Number of Students FROM Course LEFT JOIN Institution ON Institution.institutionid = Course.course\_id GROUP BY Course.courseid;