As a logic building learner you are given the task to extract the string which has vowel as the first and last characters from the given array of Strings.

Step1: Scan through the array of Strings, extract the Strings with first and last characters as vowels; these strings should be concatenated.

Step2: Convert the concatenated string to lowercase and return it.

If none of the strings in the array has first and last character as vowel, then return no matches found

input1: an integer representing the number of elements in the array.

input2: String array.

Example 1:

input1: 3

input2: {"oreo", "sirish", "apple"}

output: oreoapple

Example 2:

input1: 2

input2: {"Mango", "banana"}

output: no matches found

Explanation:

None of the strings has first and last character as vowel.

Hence the output is no matches found.

Example 3:

input1: 3

input2: {"Ate", "Ace", "Girl"}

output: ateace

```java
import java.util.Scanner;
public class Main{
    public static void main(String[] args){
    Scanner sc=new Scanner(System.in);
    int a=sc.nextInt(),c=0;
    sc.nextLine();
    String []arr=sc.nextLine().split(" ");
    for(int i=0;i<a;i++){
        String w=arr[i].toLowerCase();
        char s1=w.charAt(0);
        char s2=w.charAt(arr[i].length()-1);
        int f1=0,f2=0;
        if(s1=='a' || s1=='e' || s1=='i' || s1=='o' || s1=='u') f1=1;
        if(s2=='a' || s2=='e' || s2=='i' || s2=='o' || s2=='u') f2=1;
        if(f1==1 && f2==1)System.out.print(w);
        else c++;
        }
    if(c==a)System.out.println("no matches found");
    }
}
```

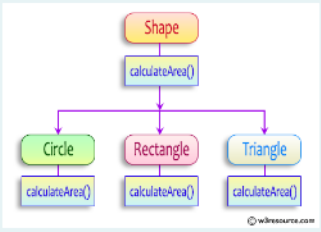
	Input	Expected	Got	
✓	3 oreo sirish apple	oreoapple	oreoapple	✓
✓	2 Mango banana	no matches found	no matches found	✓
✓	3 Ate Ace Girl	ateace	ateace	✓

Passed all tests! ✓

2)

Create a base class Shape with a method called calculateArea(). Create three subclasses: Circle, Rectangle, and Triangle. Override the calculateArea() method in each subclass to calculate and return the shape's area.

In the given exercise, here is a simple diagram illustrating polymorphism implementation:




```
abstract class Shape {
   public abstract double calculateArea() ;
   }
}
```

```
System.out.printf("Area of a Triangle :%.2f%n",((0.5)*base*height));  // use this statement
```

sample input :

```
4   // radius of the circle to calculate area PI*r*r
5   //  length of the rectangle
6  // breadth of the rectangle to calculate the area of a rectangle
4   // base of the triangle
3   //  height of the triangle
```

```
import java.util.*;

abstract class Shape {
    abstract double calculateArea();
}


class Circle extends Shape {
    private double radius;
    Circle(double r) {
        radius = r;
    }
    double calculateArea() {
        return Math.PI * radius * radius;
    }
}


class Rectangle extends Shape {
    private double length;
    private double breadth;
    Rectangle(double l, double b) {
        length = l;
        breadth = b;
    }
    double calculateArea() {
        return length * breadth;
    }
```

```
}

class Triangle extends Shape {
   private double base;
   private double height;
   Triangle(double b, double h) {
      base = b;
      height = h;
   }
   double calculateArea() {
      return 0.5 * base * height;
   }
}

public class Prog {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      double r = sc.nextDouble();
      Shape circle = new Circle(r);
      System.out.println("Area of a circle: "+String.format("%.2f",circle.calculateArea()));
      double length = sc.nextDouble();
      double breadth = sc.nextDouble();
      Shape rectangle = new Rectangle(length, breadth);
      System.out.println("Area of a Rectangle: " + String.format("%.2f",rectangle.calculateArea()));
      double base = sc.nextDouble();
      double height = sc.nextDouble();
      Shape triangle = new Triangle(base, height);
      System.out.println("Area of a Triangle: " + String.format("%.2f",triangle.calculateArea()));
   }
}
```

	Test	Input	Expected	Got	
✓	1	4 5 6 4 3	Area of a circle: 50.27 Area of a Rectangle: 30.00 Area of a Triangle: 6.00	Area of a circle: 50.27 Area of a Rectangle: 30.00 Area of a Triangle: 6.00	✓
✓	2	7 4.5 6.5 2.4 3.6	Area of a circle: 153.94 Area of a Rectangle: 29.25 Area of a Triangle: 4.32	Area of a circle: 153.94 Area of a Rectangle: 29.25 Area of a Triangle: 4.32	✓

Passed all tests! ✓

3)

1. Final Variable:

- Once a variable is declared `final`, its value cannot be changed after it is initialized.
- It must be initialized when it is declared or in the constructor if it's not initialized at declaration.
- It can be used to define constants

```
final int MAX_SPEED = 120;  // Constant value, cannot be changed
```

2. Final Method:

- A method declared `final` cannot be overridden by subclasses.
- It is used to prevent modification of the method's behavior in derived classes.

```
public final void display() {
   System.out.println("This is a final method.");
}
```

3. Final Class:

- A class declared as `final` cannot be subclassed (i.e., no other class can inherit from it).
- It is used to prevent a class from being extended and modified.
- public final class Vehicle {
  // class code
  }

```
class FinalExample {

    // Final variable
    final int maxSpeed = 120;

    // Final method
    public final void displayMaxSpeed() {
        System.out.println("The maximum speed is: " + maxSpeed + " km/h");
    }
}
class SubClass extends FinalExample {
    /*public void displayMaxSpeed() {
        System.out.println("Cannot override a final method");
    }*/
    // You can create new methods here
    public void showDetails() {
        System.out.println("This is a subclass of FinalExample.");
    }
}
class prog {
    public static void main(String[] args) {
        FinalExample obj = new FinalExample();
        obj.displayMaxSpeed();

        SubClass subObj = new SubClass();
        subObj.showDetails();
    }
}
```

	Test	Expected	Got	
✓	1	The maximum speed is: 120 km/h This is a subclass of FinalExample.	The maximum speed is: 120 km/h This is a subclass of FinalExample.	✓

Passed all tests! ✓