Name (PRINT): _____

Signature: _____

Student Number: _____

Class	Method	Brief explanation	Example
String `String a = "HELLO";  String b = "hello";`			
String	equals( )	Determine if two strings are the same or not. Returns a boolean value.	`a.equals(b)` returns false
	charAt( )	Returns the character at a specific position within a string.	`a.charAt(3)` returns 'L'
	length()	Returns the length of a string.	`a.length()` returns 5
	substring( )	Returns a substring beginning at first argument and ending at the second argument -1	`a.substring(0,3)` `returns "HEL"`
	toUpperCase( )	Returns a string in uppercase	`b.toUpperCase()` `returns "HELLO"`
	toLowerCase()	Returns a string in lowercase	`a.toLowerCase()` `returns "hello"`
Scanner Create a scanner for System.in: `Scanner kb = new Scanner(System.in);`			
Scanner	next()	Returns the next token from the scanner as a String value.	`kb.next()`
	nextInt ()	Returns the next token from the scanner as an int value.	`kb.nextInt()`
	nextLine()	Returns the next line from the scanner as a String value.	`kb.nextLine()`

1. Consider Program1 below. Show the output to the right of the various System.out.println() statements.

```
public class Program1{
    public static void main(String args[]){
        System.out.println( "99+1"+99+1);
        System.out.println( 50 % 36 % 12);
        System.out.println( 67 % 10 * 10);
        System.out.println( 5678 / 10 / 10 );
        String s = "12345";
        String sr= "";
        for (int i=s.length()-1; i>=0; i--){
            sr = sr+s.charAt(i);
        }
        System.out.println(sr);
        sr= "";
        for (int i=0; i<s.length(); i++){
            sr = sr+s.charAt(i);
        }
        System.out.println(sr);
        int k=0;
        for (int m=0; m < 4; m++) {
            for (int n=0; n < m; n++) {
                k++;
            }
        }
        System.out.println( k );
        int number = 123;
        int sum = 0;
        while (number > 0) {
            sum = sum + number;
            number = number / 10;
        }
        System.out.println( sum );
        System.out.println( (100 == 1000)?"xx":"yy" );
        sum = 0;
        int m = 0;
        while (m > 0) {
            sum = sum + m;
            m++;
        } ;
        System.out.println(sum);
    }
}
```

2. Complete the Java program1 below so it
   - prompts the user for a 9-digit SIN
   - displays an error message if the value is not 9 characters in length
   - if the length is 9 then the program displays the meaning of the SIN's first digit as shown below:

First character of SIN	Meaning
0 or 8	Not used
1	Registered in Atlantic Canada
2 or 3	Registered in Quebec
4, 5, 6, 7, or 9	unknown

```
import java.util.Scanner;
public class    Program2 {
    public static void main (String[] args){
        Scanner kb = new Scanner(System.in);
```

```
import java.util.Scanner;
public class    Program2 {
   public static void main (String[] args){
      Scanner kb = new Scanner(System.in);
      System.out.println("Enter a 9-digit SIN");
      String sin = kb.next();
      String result ="";
      if (sin.length()!=9) System.out.println("error");
      else{
         switch (sin.charAt(0)){
            case '0':
            case '8': result = "Not Used";
            break;
            case '1': result = "Registered in Atlantic Canada";
            break;
            case '2':
            case '3': result = "Registered in Quebec";
            break;
            default: result = "unknown";
         }
      }
      System.out.println(result);
   }
}
```

3. Complete the following program that obtains integers from the user and displays the average of those numbers. The user enters numbers and indicates the end by entering `0`.

   Examples:
   if the user enters `5  10  15  20  0` then the program displays
   `The average of your 4 integers Is 12.5`
   if the user enters no integers (just the value `0`) then the program displays
   `No average shown - you entered no values`

```
import java.util.Scanner;
public class    Program3{
    public static void main (String[] args) {
        Scanner kb = new Scanner(System.in);
```

```
import java.util.Scanner;
public class    Program3{
   public static void main (String[] args) {
      Scanner kb = new Scanner(System.in);
      System.out.println("Enter a list of integers"
         +" ended by zero");
      int number = kb.nextInt();
      int count = 0;
      int sum = 0;
      while (number != 0) {
         sum += number;
         count++;
         number = kb.nextInt();
      }
      if (count==0){
         System.out.println(
            "No average shown - you entered no values");
      }
      else{
         System.out.println("The average of your "+count
            +" integers is "+(sum+0.0)/count);
      }
   }
}
```

4. Complete the following program that obtains exactly 10 words from the user and displays each word in lowercase with vowels (`a, e, i, o, u`) removed.

   Your program <u>must use a loop</u>; each time the loop executes one word is processed.

   Example: if the user enters the word `Hello`
   then the program displays `hll`.

   Example: if the user enters the word `Exit`
   then your program displays `xt`.

```
import java.util.Scanner;
public class    Program4{
    public static void main (String[] args){
        Scanner kb = new Scanner(System.in);
```

```
import java.util.Scanner;
public class    Program4
{ public static void main (String[] args)
   {
      Scanner kb = new Scanner(System.in);
      System.out.println("Enter 10 words");
      for (int i=0;i<10;i++){
         String word = kb.next().toLowerCase();
         String newWord = "";
         for (int j=0;j<word.length();j++){
            if (word.charAt(j)=='a'|| word.charAt(j)=='e'||
               word.charAt(j)=='i'|| word.charAt(j)=='o'||
               word.charAt(j)=='u')
            { // do nothing
            }
            else {
               newWord+=word.charAt(j);
            }
         }
         System.out.println(newWord);
      }
   }
}
```