1. Write the Java code for a method named `countA()` that accepts a String parameter named `str`. The method should compute and return the number of occurrences of the letter ‘A’ in `str`. For example, if the method is invoked with the String “HAPPY BIRTHDAY”, it should return 2.

Write your method using a `for` loop for the repetition.
2. Assume `countA()` as described above is defined as a static method in some class, and that the
a String has already been obtained from the user and stored in a variable named `msg`.

Write a code fragment that could be used in the main() method of that class to invoke `countA()` so as to print the number of A’s in `msg` as follows:

```
The message contains 2 occurrences of the letter A.
```

(In this example, we are assuming `msg`=”HAPPY BIRTHDAY” – but your code should work for any String.)

3. Does the output produced by your code, above, always use singular/plural appropriately?

If not, show how to modify it with the use of the conditional operator, so that it does.
1. Write the Java code for a method named `sumRange()` that accepts two integer parameters that represent a range. Issue an error message and return zero if the second parameter is less than the first. Otherwise, the method should return the sum of the integers in that range (inclusive). For example, if the method is invoked with the values 3 and 7, it should return 25 (i.e., 3+4+5+6+7).

Write your method using a `for` loop for the repetition.
2. Assume `sumRange()` as described above is defined as a static method in some class, and that the values 3 and 7 have already been obtained from the user and are stored in variables named `a` and `b`, respectively.

Write a code fragment that could be used in the main() method of that class to invoke `sumRange()` so as to print the following message:

```
The sum of the values in the range 3 to 7 is 25.

(In this example, we are assuming a=3 and b=7.)
```

3. Continuing on from the previous question, suppose you also have another variable, named `limit`, and you would like to add to the above message another sentence stating whether the sum obtained from `sumRange()` exceeds `limit`. In the above example, if the value of `limit` is 20, the message printed should be:

```
The sum of the values in the range 3 to 7 is 25, exceeding the limit (=20).
```

Or, if the value of `limit` is 100, the message printed should be:

```
The sum of the values in the range 3 to 7 is 25, below the limit (=100).
```

How would you modify your code from question 2 with the use of the conditional operator so as to achieve this? Show the new version of the code or state what you would add to the previous version.
1. Show what gets printed and rewrite using a while loop:

```java
int a = 0;
do {
    System.out.println(a);
    a++;
} while (a < 4);
```

Using while loop:

```java
for (int a = 3; a > 0; a--)
{
    System.out.println(2*a);
}
```

Using while loop:

**Output:**

2. Write the Java code for a method named `skipper()` that accepts a String parameter named `word` that uses a for-loop to print every other character stored in a `String` starting with the first character. Your method should not return anything.

```java
public void skipper(String word) {
    for (int a = 0; a < word.length(); a += 2) {
        System.out.print(word.charAt(a));
    }
}
```
3. Show the output of the GradeReport program generated in the switch statement below (no need to show other output, eg the prompts) if the user enters each of the following inputs. Does the output change if the break statement indicated below is removed? (redo the question with the break statement removed – you can just write “same” if it does not change anything).

<table>
<thead>
<tr>
<th>With break in place:</th>
<th>With break removed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 105</td>
<td></td>
</tr>
<tr>
<td>b) 86</td>
<td></td>
</tr>
<tr>
<td>c) 33</td>
<td></td>
</tr>
</tbody>
</table>

```java
//*******************************
// GradeReport.java  Author: Lewis/Loftus
//*******************************
import java.util.Scanner;
public class GradeReport {
    public static void main (String[] args) {
        int grade, category;
        Scanner scan = new Scanner (System.in);
        System.out.print ("Enter a numeric grade (0 to 100): ");
        grade = scan.nextInt();
        category = grade / 10;
        System.out.print ("That grade is ");
        switch (category) {
            case 10:
                System.out.println ("perfect!");
                break;
            case 9:
                System.out.println ("excellent.");
                break;
            case 8:
                System.out.println ("good.");
                break;
            case 7:
                System.out.println ("average.");
                break;
            case 6:
                System.out.println ("below average. See your instructor");
                break;
            default:
                System.out.println ("not passing.");
        }
    }
}
```
1. Show what gets printed and rewrite using a while loop:

```java
int a = 5;
while (a >= 0) {
    System.out.println(a);
    a = a - 2;
}
```

Using while loop:

Output:

```
Using while loop:
```

```java
for (int a = 1; a <= 5; a++)
    if (a%2==0) System.out.println(a);
```

Using while loop:

Output:
2. Express the following logic in a succinct manner using the conditional operator.

```java
if (val <= 20)
    System.out.println("small number");
else
    System.out.println("big number");
```

3. Write the Java code for a method named `reversed()` that accepts a String parameter named `message` and uses a for-loop to create and return a string with the characters of `message` backwards.