



A scientist is using a gas sensor to collect data about oxygen levels in a river.

The sensor is connected to a laptop and the data from the sensor is stored in an array, *riverData*.

1 reading is taken each hour for 12 hours. Here is a sample data set:

```
riverData = [32.1, 37.6, 30.5, 33.6, 40.1, 42.0, 37.9, 32.1, 31.1, 31.4, 43.2, 38.4]
```

A computer program is going to analyse the array.

We know the number of items stored in the array: 12

So, we can use a count-controlled loop to analyse the array:

```
FOR i <- 1 TO 12
```

A program needs to be written to count how many of the items in the array are greater than the **danger value** of 40.0

Here is an attempt to write the program in PSEUDOCODE – there are three blanks.

```
riverData <- [32.1, 37.6, 30.5, 33.6, 40.1, 42.0, 37.9, 32.1, 31.1, 31.4, 43.2, 38.4]
```

```
count <- _____
```

```
FOR i <- 1 TO 12
```

```
    IF riverData[_____] > 40.0 THEN
```

```
        count <- count _____
```

```
    END IF
```

```
END FOR
```

```
IF count >= 6 THEN
```

```
    OUTPUT "Consistent danger levels - Take action"
```

```
ELSE
```

```
    OUTPUT count, "readings above 40.0 - no action required"
```

```
END IF
```

Task 1: Fill the blanks and **write the algorithm in Python**.

Task 2: **Test your solution** with these three data sets:

<i>riverData</i>	<i>Expected output</i>
[0,0,0,0,0,0,0,0,0,0,0]	0 readings above 40.0 – no action required
[50,50,50,50,50,50,50,50,50,50,50]	Consistent danger levels – take action!
[0,0,0,0,0,0,50,50,50,50,50]	Consistent danger levels – take action!

Task 3: **Draw a flowchart** to represent the algorithm. Here is a reminder of how to use the various shapes:

	START / STOP
	PROCESS DATA eg x = 3, sum = sum + 1 etc
	INPUT / OUTPUT
	SELECTION (IF/ELSE)

Task 4: What is puzzling you about this topic? What questions do you have? Think and then write any questions or thoughts below: