# Algorithms involving iteration

1. How many times will the following loop iterate?

int j = 1;

while (j < 5) {

Console.Writeline(‘Woohoooo!’)

j = j + 1;

}

**Iterations: \_\_\_\_4\_\_\_\_\_**

2. How many times will the following loop iterate?

for (int i = 1; i <= 5; i++) {

Console.Writeline(‘Hey’)

}

**Iterations: \_\_\_5\_\_\_\_\_\_**

3. What will be the output of the following code?

int i = 1;

while ((i <= 3)) { //will run 3 times

for (int j = 1; j <= 2; j++) { // will run 6 times

Console.Write(i & ‘,’ & j & ‘ ‘)

}

i = i + 1;

}

I + 1 J =2

1 , 1 1, 2

**Output:** 4. Write the following *for* loop as a *while* loop.

for (int m = 97; m <= 195; m++) {  
 k = k \* m;  
 p = p + m + 1;  
}

M = 97

While ((M<=195))

{

K = k \* m;

P=p+m+1;

M=m+1

}

5. Write in pseudo-code an algorithm (that uses a FOR loop) which carries out the following:

1. Ask the user to enter 8 lower-case letters separately (by pressing <Enter> after each.)
2. After the 8th letter is entered, the letters are displayed as a single string, in the order that they were entered.

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6. Write in pseudo-code an algorithm (that uses a FOR loop) which carries out the following:

1. Ask the user to enter 8 lower-case letters separately (by pressing <Enter> after each.)
2. After the 8th letter is entered, the letters are displayed as a single string, in the **reverse**  
   order that they were entered.

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7. Write in pseudo-code an algorithm (that uses a WHILE loop) which carries out the following:

1. Ask the user to enter 8 lower-case letters separately (by pressing <Enter> after each.)
2. If a letter is the same as the **immediately preceding** letter, an error message appears and the repeated letter is discarded.
3. After the 8th letter is entered, the letters are displayed as a single string, in the order that they were entered.

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8. Write in pseudo-code an algorithm which carries out the following:

1. Ask the user to enter 8 different lower-case letters separately (by pressing <Enter> after each.)
2. If a letter is the same as **any** previous letter, an error message appears and the repeated letter is discarded.
3. After the 8th letter is entered, the letters are displayed as a single string, in the order that they were entered.

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**EXTENSION**

9. Write in pseudo-code an algorithm which carries out the following:

1. Ask the user to enter a **string** consisting of 8 lower-case letters (terminated by pressing <Enter>.)
2. If the string is too short, too long or contains any character that is not a lower case letter then an **appropriate** error message appears (telling the user what is wrong).

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10. Write in pseudo-code an algorithm which carries out the following:

1. Ask the user to enter a **string** of 8 different lower-case letters (terminated by pressing <Enter>.)
2. If the string contains more than one of any letter then an **appropriate** error message appears (telling the user what is wrong).

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