

4: Basic Building Blocks: Pre-Test Loop Worksheet

Aim:

The aim of this worksheet is to:

- understand Pre-test loop control structures
 - o While loop
 - o For next loop
- create a working JAVASCRIPT program that contains a pre-test loop

Control Structure - Pre-test Loop – While loop

The control structure that requires steps to be repeated several times is called an **iteration**, repetition or loop.

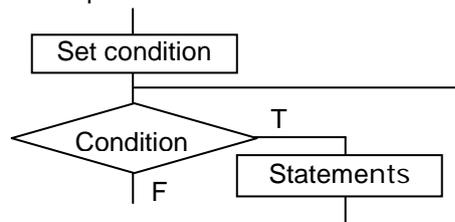
The "Pre-Test Loop" below checks the condition to be tested "first", while the condition is true, the statements within the loop (body of the loop) will be executed.

The important point here for the Pre-test loop is that if the condition is **not** True to start with then the loop will **not** enter the loop and execute the statements.

Pseudocode

```

set condition
WHILE (condition is True)
    (do statements)
ENDWHILE
  
```



Problem Statement

Create a program that will print out from the number "1" to a "number entered" using a Pre-test loop

Solution – IPO chart

Input	Process	Output
Number	Using incremented "count" variable, loop over "input" number times	Loop number "count"

Solution – Pseudocode Algorithm

```

BEGIN
    Enter NumberofLoops
    Set count = 1
    WHILE count <= NumberOfLoops
        output = output + 'Number' count
        count = count + 1
    END WHILE
    Print output
END
  
```

Activity 1: Draw flowchart

Draw the flowchart for the Pre-Test Loop example pseudocode

Activity 2: Create JavaScript program code

Create the JavaScript code for the Example Problem above and save it to the appropriate Solutions folder in your mobile website.

1. Copy the HTML in **Figure 2** into the section tag of the **JS_preTestLoop.html** file in the Solutions folder of your website.
2. **Add the comments** to the top of the pages including your name and detail of the page/code

Figure 1: HTML Form

Enter number

Figure 2: JavaScript code - Pretestloop.html

```
<form name="form">
  Enter Number: <input name="numb" type="text" id="numb"/><br>
  <input type="button" value="submit" onClick="process()" />
</form>
<br>
Answer <div id="answer"> </div>

<script>
  function process(){
    var numofloops = new Number(document.form.numb.value);
    var output = "";
    var count = 1;
    while (count <= numofloops){
      output = output + "Number " + count + "<br>";
      count = count + 1 ;
    }
    document.getElementById('answer').innerHTML = output;
  }//end function
</script>
```

Activity 3: Test the program

Test the JavaScript program from Activity 2, complete the table below and answer the question using following test data.

Enter Number	Expected Output	Actual Output
5	Number;1 Number;2 Number;3 Number;4 Number;5	

Does the program produce the expected output? If not why?

Activity 4: Questions about the code

What is the code line `count = count + 1` doing? What is its purpose?

In the Algorithm the variable `count` is set to zero at the beginning. What would happen if you set this to one?

Activity 5 Ext: Modify the JavaScript code to check data

a) Use the following data to test your program.

Enter Number	Expected Output	Actual Output
- 4	Error "only positive numbers allowed"	

Why does the program not work?

- b) **Re-write** the **algorithm** so that the error message appears if the user inputs a number below 1. The Error Message should say "you are only allowed to enter positive numbers. Please try again"
- c) **Now CODE** this solution and put into the section tag of the **pretestloopSolExt5.html** file in the Solutions folder of your website.

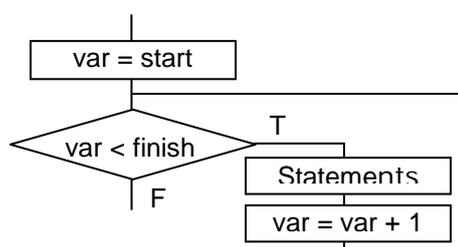
Control Structure - Pre-test Loop – For next loop

Another way of writing a loop is to use the FOR NEXT loop. The For next loop will execute a set number of times based on a counter variable

Pseudocode

```
FOR variable = start TO finish STEP increment
  (do statements)
NEXT variable
```

Flowchart



Problem Statement

Create a program that will print out every second number from the number "1" to a "number entered" using a For Loop

Solution – Pseudocode Algorithm

```
BEGIN
  Enter NumberofLoops
  FOR count = 1 to NumberOfLoops STEP 2
    PRINT 'This is loop number' count
  NEXT count
END
```

Activity 6: Create JavaScript code

- Copy the HTML in Figure 4 below into the section tag of the **pretestloopSolExt6.html** file in the Solutions folder of your website.
- Add the comments to the top of the pages including your name and detail of the page/code

Figure 4: JavaScript code - ForNextloop.html

```
<form name="form">
  Enter Number to count to:
  <input name="numb" type="text" id="numb"/><br>
  <input type="button" value="submit" onClick="process()" />
</form>
<br>
Answer <div id="answer"> </div>

<script>
  function process(){
    var numofloops = new Number(document.form.numb.value);
    var output = "";
    for (var count = 1; count <= numofloops; count= count + 2) {
      output = output + "Number " + count + "<br>"
    }
    document.getElementById('answer').innerHTML = output;
  } //end function
</script>
```

Activity 7: Draw flowchart

Create a flow chart for the pseudocode in Figure 4.