Task 3. Hailstone Sequence: PHP loops.

Douglas Hofstadter's Pulitzer-prize-winning book Gödel, Escher, Bach contains many interesting mathematical puzzles, many of which can be expressed in the form of computer programs. In Chapter XII, Hofstadter mentions a wonderful numeric consistent sequence . It's called the Hailstone Sequence and can be expressed as follows:

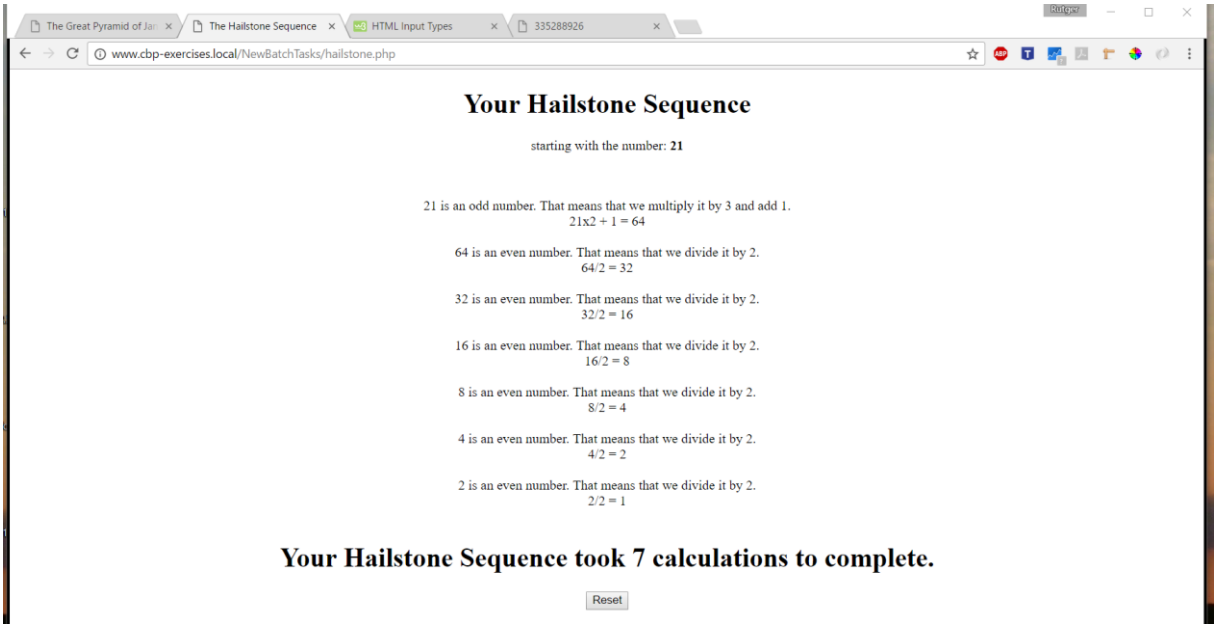
1. Pick some positive integer and call it **n**.

2a. If **n** is even, divide it by two.

2b. If **n** is odd, multiply it by three and add one.

3. Continue this process until n is equal to one.

Also see the calculation (starting with the number 21) below.



As you can see from this example, the numbers go up and down, but eventually—at least for all numbers that have ever been tried—comes down to end in 1. In some respects, this process is reminiscent of the formation of hailstones, which get carried upward by the winds over and over again before they finally descend to the ground. Because of this analogy, this sequence of numbers is usually called the Hailstone sequence, although it goes by many other names as well.

Write a PHP script that reads in a number from the user and then displays the Hailstone sequence for that number, just as in Hofstadter's book, followed by a line showing the number of steps taken to reach 1. If you need help you can use the step by step programming guide on the next page.

Step by step programming guide

1. We start by writing an introduction. What does this program do. Besides we give the user the input field, where he can enter the integer of his/her choice. Pass it on using the $_POST variable(s).
2. We check what script we should load. If an integer is put in, this integer should be set to a variable so it can be used by the script. If the user visits the page for the first time or just hit the 'reset'-button, the script should process this accordingly. Also set the variable that defines the total number of calculations it takes to reach the final result(1).
3. Maybe it is smart to make a button (form) to activate the reset.
4. Using inline PHP we can create the script that prints the Hailstone calculation process on the screen.
5. Add CSS styling of your choice.