**OOP Practical Work 2**

**<?php**

**class CollatzCalculator {**

**public function calculate($x) {**

**$count = 0;**

**while ($x != 1) {**

**if ($x % 2 == 0) {**

**$x /= 2;**

**} else {**

**$x = 3 \* $x + 1;**

**}**

**$count++;**

**}**

**return $count;**

**}**

**}**

**class RangeAnalyzer {**

**private $calculator;**

**public function \_\_construct() {**

**$this->calculator = new CollatzCalculator();**

**}**

**public function analyzeRange($start, $end) {**

**$maxValue = 0;**

**$minValue = PHP\_INT\_MAX;**

**$maxNumbers = [];**

**$minNumbers = [];**

**$totalIterations = 0;**

**for ($i = $start; $i <= $end; $i++) {**

**$currentIterations = $this->calculator->calculate($i);**

**$totalIterations += $currentIterations;**

**if ($currentIterations > $maxValue) {**

**$maxValue = $currentIterations;**

**$maxNumbers = [$i];**

**} elseif ($currentIterations == $maxValue) {**

**$maxNumbers[] = $i;**

**}**

**if ($currentIterations < $minValue) {**

**$minValue = $currentIterations;**

**$minNumbers = [$i];**

**} elseif ($currentIterations == $minValue) {**

**$minNumbers[] = $i;**

**}**

**}**

**return [**

**'max\_value' => $maxValue,**

**'max\_numbers' => $maxNumbers,**

**'min\_value' => $minValue,**

**'min\_numbers' => $minNumbers,**

**'total\_iterations' => $totalIterations**

**];**

**}**

**}**

**// Prompt user for range values**

**$startRange = (int)readline("Enter the start of the range: ");**

**$endRange = (int)readline("Enter the end of the range: ");**

**// Find max and min values and numbers with max and min iterations for range**

**echo "\nFinding max and min values and numbers with max and min iterations for range $startRange to $endRange\n";**

**$analyzer = new RangeAnalyzer();**

**$result = $analyzer->analyzeRange($startRange, $endRange);**

**echo "Max value: " . $result['max\_value'] . "\n";**

**echo "Numbers achieving max value: " . implode(", ", $result['max\_numbers']) . "\n";**

**echo "Min value: " . $result['min\_value'] . "\n";**

**echo "Numbers achieving min value: " . implode(", ", $result['min\_numbers']) . "\n";**

**echo "Total iterations: " . $result['total\_iterations'] . "\n";**

**?>**