

# Andela Nigeria Cycle 37 Technical Challenge.

**Instructions for submission:** Create an account on [codepen.io](https://codepen.io) and attempt **any 1** of the questions. You are required make use of **only** HTML, CSS and Javascript, and NO FRAMEWORKS. Please submit via this [form](#) before **12pm on Sunday, September 16th, 2018**.

## Question 1

Kaprekar's constant	
<b>Context</b>	<p>Take any four-digit number (whose digits are not all identical) and do the following;</p> <ol style="list-style-type: none"><li>1. Rearrange the string of digits to form the largest and smallest 4-digit numbers possible.</li><li>2. Take these two numbers and subtract the smaller number from the larger.</li><li>3. Use the number you obtain and repeat the above process.</li></ol> <p><b>The most amazing thing is this: Every four digit number whose digits are not all the same will eventually hit 6174, in at most 7 steps, and then stay there!</b></p> <p>For more information, use this <a href="#">link</a>.</p>
<b>Task</b>	<p>Write an algorithm to compute the Kaprekar's constant on any four-digit number. The algorithm must do the following:</p> <ul style="list-style-type: none"><li>• Take <b>only</b> four-digit numbers whose digits are not identical.</li><li>• Return the number of steps taken to get to the Kaprekar's constant (6174).</li></ul> <p>Example: using 3524.</p> $5432 - 2345 = 3087$ $8730 - 0378 = 8352$ $8532 - 2358 = \mathbf{6174}$ $7641 - 1467 = \mathbf{6174}$ <p><b>This above example should return "3", because it took 3 steps to get to the constant.</b></p>
<b>UI Design</b>	<ul style="list-style-type: none"><li>• An input text field to collect the four-digit number.</li><li>• Buttons to perform the operation.</li><li>• Div to display result.</li></ul>

**Question 2**

<b>Circular primes</b>	
<b>Context</b>	Circular primes are primes in which numbers formed from the rotation of the digits are themselves primes e.g. 197, which has rotations, 197, 971 and 719. For more context, visit this <a href="#">link</a> .
<b>Task</b>	Write an algorithm that takes a number and returns the number of circular primes below the given number, following these conditions: <ol style="list-style-type: none"><li>1. The number <b>must</b> range between <b>100 - 100,000</b>.</li><li>2. Return the number of circular primes below the number given.</li></ol> Example: <ul style="list-style-type: none"><li>• For <b>100</b>, the number of circular primes is <b>13</b></li></ul>
<b>UI Design</b>	<ul style="list-style-type: none"><li>• An input text field to collect the number.</li><li>• Buttons to perform the operation.</li><li>• Div to display result.</li></ul>

### Question 3

Grid Rotator																											
Context	Laying out nine(9) buttons to form a 3 x 3 grid inside a <i>div</i> and modifying their labels after each click event on one of the buttons. <b>Important: The labels on the outer button must rotate in a clockwise direction each time we click the middle button</b>																										
	<div><div>Initial State:</div><table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td></tr><tr><td>7</td><td>8</td><td>9</td></tr></table></div> <div><div>After Clicking the middle button (button 5) 1 time:</div><table><tr><td>4</td><td>1</td><td>2</td></tr><tr><td>7</td><td>5</td><td>3</td></tr><tr><td>8</td><td>9</td><td>6</td></tr></table></div> <div><div>After Clicking the middle button (button 5) 2 times:</div><table><tr><td>7</td><td>4</td><td>1</td></tr><tr><td>8</td><td>5</td><td>2</td></tr><tr><td>9</td><td>6</td><td>3</td></tr></table></div>	1	2	3	4	5	6	7	8	9	4	1	2	7	5	3	8	9	6	7	4	1	8	5	2	9	6
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8	5	2																									
9	6	3																									
Task	<ul style="list-style-type: none"><li>Design the UI to show a 3 x 3 grid form containing buttons labelled 1 - 9 as shown above.</li><li>Write an algorithm to rotate the outer buttons in a clockwise direction every time the middle button (button 5) is clicked.</li></ul>																										
UI Design	<ul style="list-style-type: none"><li>A div to contain the grid</li><li>Buttons for the numbers</li></ul>																										

**Question 4**

<b>Time Conversion</b>	
<b>Context</b>	<p>Write two algorithms to do the following time conversions:</p> <ul style="list-style-type: none"><li>• Given a time in 12-hour AM/PM format, convert to military (24-hour) time.</li><li>• Given a time in military (24-hour) time, convert to 12-hour AM/PM format.</li></ul> <p><b>Note: Midnight is 12:00:00 AM on a 12-hour clock, and 00:00:00 on a 24-hour clock. Noon is 12:00:00 PM on a 12-hour clock, and 12:00:00 on a 24-hour clock.</b></p>
<b>Task</b>	<p>Design the UI to show input collections for both 12-hour AM/PM time format and the 24-hour time format for conversion with the following conditions:</p> <ul style="list-style-type: none"><li>• A clear description of what input takes what format (military or AM/PM format).</li><li>• Seperate divs to display results</li><li>• Convert time and display results</li></ul>
<b>UI Design</b>	<ul style="list-style-type: none"><li>• Seperate inputs for both time format</li><li>• Buttons for each conversion</li><li>• Divs to display results for each</li></ul>