Etude 10

James Pusey - 5738464

Ben Stacey - 2157359

**Analysis:**

The general problem of every puzzle: We aim to have every button in the inactive state while achieving this in the least moves possible.

* We can consider 1 move to be pressing any button once.
* We can consider a button to be inactive if it is visually pressed down and a active if it is up

Main factors of every puzzle:

* Pressing a button will press every other button with the same color and shape regardless of location
* Typically puzzles will start with either all buttons active or a small selection active.

Commonalities between puzzles:

* The first few puzzles aim to get you to understand how the game works as described above
* Many of the puzzles make it seem as as though whenever a button is pressed all those in the same row/column will be pressed. However this is not always the case.
* More often than not a puzzle will be structured such that either rows or column are represented by either colors or shapes.

General approach to each puzzle:

* First identify the type of puzzle it is. By this we mean whether or not it falls into the category of rows/columns as shapes/colors. If not, ask yourself why not, what makes this puzzle unique. If it is, then typically the puzzle will have a crux button, ie. one which stands out and is crucial to determining its solution.

**Level 8: Moves 3**

This puzzle is consutructed in the typical method as stated above such that each row is represented by a color and each column is represented by a shape. It consists of a ring with 8 buttons. What immiedietley stands out is that not every button is initially pressed, thus we asked ourselves why in order to solve this puzzle

.A picture containing diagram

Description automatically generated

* Step 1) Push any corner button upraised.
* Step 2) Then push adjacent button that has the same shape
* Step 3) Then push corner button that has same color as button pushed in 1 but a different shape
* Example (Blue Star, yellow star, blue circle)

This one we actually got first try, we think it was actually rather intuitive on how to solve and required no trial error as it is impossible to solve in 2. Thus it was determining which 2nd press would allow us to complete the puzzle.

**Level 17: Moves 10**

This puzzle is a slight deviation of the typical form. Shapes do represent columns however colors almost represent rows, but rather only connected rows. For example blue and yellow represented to two separated segments of row 1. Where as orange and purple represent separate segments of row 2. This puzzle was one of the more unique ones found. This is due to the duel nature of the puzzle by having two starting points. We asked ourselves why this unique structure was so important to solving this puzzle, and determined to solve it we would need to use a snakelike attack.

A picture containing polygon

Description automatically generated

* Step 1) Press blue circle
* Step 2) Press orange circle
* Step 3) Press yellow square
* Step 4) Press purple square
* Step 5) Press purple star
* Step 6) Press red triangle
* Step 7) Press orange diamond
* Step 8) Press green diamond
* Step 9) Press orange circle
* Step 10) press yellow square

We first believed we must move down from the right and left side respectively until converged on the red triangle however we soon realized the mistake of this approach in that we would be forced to reactivate a button in the path behind when the two path converge. Thus we adapted a more snake approach from the right side to the left.

**Level 24: Moves 6**

This puzzle depicts the typical format of rows representing shapes and columns representing colors. It also follows the types of puzzles in which all buttons begin active. Thus we decoded to focus on the addition of the blue buttons, as they appear to be the crux of the puzzle. We asked ourselves why include them?

Diagram

Description automatically generated

* Step 1) Press yellow square
* Step 2): blue x
* Step 3) Press purple diamond
* Step 4) Press yellow diamond
* Step 5) green diamond
* Step 6): yellow square

We based our logic on the blue square and x being the critical component of this puzzle. By that we mean it was the crux button. After several trial and errors we determined that by pressing the yellow square and then the blue x, we effectively make so we need the third column to be completely unpressed and we will finish. After several trial and errors surrounding this logic we found the right combination