Graph Characteristics

Board Characteristics

- 6×6 Matrix
- Each square contains a number/color combination (eg. 1, Blue)
- Because it is a 6×6 matrix we chose numbers 1-6 and six colors, namely (blue, pink, white, green, red, & yellow)
- We use every possible permutation of the number/color combination to give us 6^2 squares.

Node Characteristics

- Tile Number
- Node Color
- Node Number

Edge Characteristics

- Edge exists iff
  - same node number
  - same node color
  - both nodes exist on same x or y axis

Let's get some basic imports out of the way

```
In [2]:  import matplotlib.pyplot as plt
         import networkx as nx
         import numpy as np
         import random
         import matplotlib.pyplot as plt
         import scipy as sp
         import itertools
         import copy
```

Next, We structure our squares, tiles, and boards so we can visualize the boards.

Implementing classes with all necessary methods

In [6]:
```python
class Square:
    def __init__(self, color, number):
        self.color = color
        self.number = number

class Tile:
    def __init__(self, tile_number, matrix):
        self.number = tile_number
        # TODO: check if perfect square?
        self.matrix = matrix
        self.orientation = 0

    # since we always have a matrix and to make future operations simpler, we adjust
    # to return the integer which, when squared, forms the size of our matrix
    def get_shape(self):
        return self.matrix.shape[0]

    def orient_tile(self, desired_orientation):
        change = desired_orientation - self.orientation
        if (change == 0):
            return
        # in OUR SPECIFIC CASE this only occurs from 270 to zero
        if (change < 0):
            self.rotate_right()
        elif (change == 90):
            self.rotate_right()
        elif (change == 180):
            self.rotate_right()
            self.rotate_right()
        elif (change == 270):
            self.rotate_right()
            self.rotate_right()
            self.rotate_right()

        self.orientation = desired_orientation

    def rotate_right(self):
        self.matrix = np.rot90(self.matrix, k=-1, axes=(0, 1))

    def print_tile(self):
        for row in self.matrix:
            for cell in row:
                print(cell.color, end=' ')
                print(cell.number, end=' ')
            print("\n")

    def print_tile_row(self, row):
        for cell in self.matrix[row]:
            print(cell.color, end=' ')
            print(cell.number, end=' | ')

    def get_tile_row(self, row):
        return self.matrix[row]

class Board:
```

```python
    def __init__(self, matrix):
        # constructor will accept a matrix of Tiles.
        self.matrix = matrix
        self.graph = nx.Graph()
        self.adjacency_dict = {}
        # TODO: check if perfect square?

    def print_board(self):
        tile_shape = self.matrix[0][0].get_shape()

        for x in range(tile_shape):
            self.matrix[0][0].print_tile_row(x)
            self.matrix[0][1].print_tile_row(x)
            print("\n")

        for x in range(tile_shape):
            self.matrix[1][0].print_tile_row(x)
            self.matrix[1][1].print_tile_row(x)
            print("\n")

    # deconstructs the board into a matrix of squares
    def deconstruct_board(self):
        tile_shape = self.matrix[0][0].get_shape()
        deconstructed_matrix = []
        for x in range(tile_shape):
            row = np.concatenate([self.matrix[0][0].get_tile_row(x), self.matr
ix[0][1].get_tile_row(x)])
            deconstructed_matrix.append(row)

        for x in range(tile_shape):
            row = np.concatenate([self.matrix[1][0].get_tile_row(x), self.matr
ix[1][1].get_tile_row(x)])
            deconstructed_matrix.append(row)

        return deconstructed_matrix

    def build_graph(self):
        deconstructed_matrix = np.array(self.deconstruct_board()).reshape(6,6)
        # make each square a graph node
        for row in deconstructed_matrix:
            for elem in row:
                label = elem.color + str(elem.number)
                self.graph.add_node(elem, label=label)

        # for each node draw edges
        for row_index, row in enumerate(deconstructed_matrix, start=0):
            for col_index, elem in enumerate(row, start=0):
                # examine column, if same number or color, create an edge
 between the two nodes
                # library handles case of duplicate edges
                for square in deconstructed_matrix[:,col_index]:
                    if(square.color == elem.color or square.number == elem
.number):
                        self.graph.add_edge(square,elem)

                # examine row, if same number or color, create an edge bet
ween the two nodes
```

```python
                        # library handles case of duplicate edges
                    for square in deconstructed_matrix[row_index]:
                        if(square.color == elem.color or square.number == elem
.number):
                            self.graph.add_edge(square,elem)

        self.graph.remove_edges_from(nx.selfloop_edges(self.graph))

    def print_graph(self):
        labels = nx.get_node_attributes(self.graph, 'label')
        pos = nx.spring_layout(self.graph,k=0.75,iterations=20)
        plt.figure(3,figsize=(10,6))
        nx.draw(self.graph, pos, labels=labels, node_size=500, font_weight='bo
ld', node_color='y')
        plt.show()

    def get_laplacian_matrix(self):
        return nx.laplacian_matrix(self.graph)

    def get_adjacency_matrix(self):
        return nx.adjacency_matrix(self.graph)

    def is_connected(self):
        return nx.is_connected(self.graph)

    def print_graph_characteristics(self):
        print("Graph characteristics: ")
        print(self.graph.number_of_nodes(), "nodes")
        print(self.graph.number_of_edges(), "edges")
        print("Connected?", nx.is_connected(self.graph))

    def set_adjacency_dict(self):
        if self.graph.number_of_nodes() == 0:
            return "ERROR"

        adjacency_dict = {}

        for n, nbrdict in self.graph.adjacency():
            adjacency_dict[n.color + str(n.number)] = []
            for item in nbrdict:
                adjacency_dict[n.color + str(n.number)].append(item.color + st
r(item.number))

        self.adjacency_dict = adjacency_dict

    def print_adjacency_dict(self):
        if self.graph.number_of_nodes() == 0:
            return "ERROR"

        adjacency_dict = {}

        for n, nbrdict in self.graph.adjacency():
            adjacency_dict[n.color + str(n.number)] = []
            for item in nbrdict:
                adjacency_dict[n.color + str(n.number)].append(item.color + st
r(item.number))
```

```
            #print adjancecy dict for verfication of correctness
            for k, v in adjacency_dict.items():
                print (k, '-->', v)
```

We have the key classes implemented. Let's build the actual microrobots board.

```
            #print adjancecy dict for verfication of correctness
            for k, v in adjacency_dict.items():
                print (k, '-->', v)
```

```
In [7]:  def build_actual_blackside_microrobots_board():
             tileOne = Tile(1, np.array([[Square("W", 6), Square("B", 6), Square("B", 2
         )],
                     [Square("R", 3), Square("Y", 4),Square("W", 3)],
                     [Square("B", 3), Square("G", 4), Square("W", 5)]], dtype=np.objec
         t).reshape(3,3))

             tileTwo = Tile(2, np.array([[Square("P", 5), Square("P", 2), Square("P", 3
         )],
                         [Square("R", 6), Square("R", 4),Square("Y", 3)],
                         [Square("B", 4), Square("G", 5), Square("G", 3)]], dtype=np.o
         bject).reshape(3,3))

             tileThree = Tile(3, np.array([[Square("B", 1), Square("R", 2), Square("W",
         4)],
                         [Square("W", 1), Square("G", 2),Square("G", 6)],
                         [Square("Y", 2), Square("W", 2), Square("P", 4)]], dtype=np.o
         bject).reshape(3,3))

             tileFour = Tile(4, np.array([[Square("P", 1), Square("Y", 6), Square("Y",
         1)],
                         [Square("Y", 5), Square("B", 5),Square("R", 5)],
                         [Square("P", 6), Square("R", 1), Square("G", 1)]], dtype=np.o
         bject).reshape(3,3))

             return Board(np.array([[tileOne, tileTwo], [tileThree, tileFour]], dtype=n
         p.object).reshape(2,2))

         blackside_board = build_actual_blackside_microrobots_board()

         blackside_board.print_board()

         def build_actual_copperside_microrobots_board():
             tileOne = Tile(1, np.array([[Square("P", 2), Square("G", 3), Square("P", 4
         )],
                     [Square("W", 4), Square("W", 5),Square("W", 1)],
                     [Square("P", 1), Square("G", 5), Square("G", 4)]], dtype=np.objec
         t).reshape(3,3))

             tileTwo = Tile(2, np.array([[Square("W", 3), Square("G", 2), Square("R", 5
         )],
                         [Square("G", 1), Square("W", 2),Square("G", 6)],
                         [Square("Y", 3), Square("Y", 1), Square("R", 1)]], dtype=np.o
         bject).reshape(3,3))

             tileThree = Tile(3, np.array([[Square("B", 2), Square("Y", 6), Square("P",
         5)],
                         [Square("B", 4), Square("W", 6),Square("P", 6)],
                         [Square("B", 3), Square("Y", 4), Square("B", 1)]], dtype=np.o
         bject).reshape(3,3))

             tileFour = Tile(4, np.array([[Square("P", 3), Square("R", 6), Square("R",
         2)],
                         [Square("B", 6), Square("Y", 2),Square("R", 3)],
                         [Square("B", 5), Square("Y", 5), Square("R", 4)]], dtype=np.o
         bject).reshape(3,3))
```

```
    return Board(np.array([[tileOne, tileTwo], [tileThree, tileFour]], dtype=n
p.object).reshape(2,2))

copperside_board = build_actual_copperside_microrobots_board()
print("")
copperside_board.print_board()
```

```
W 6 | B 6 | B 2 | P 5 | P 2 | P 3 |

R 3 | Y 4 | W 3 | R 6 | R 4 | Y 3 |

B 3 | G 4 | W 5 | B 4 | G 5 | G 3 |

B 1 | R 2 | W 4 | P 1 | Y 6 | Y 1 |

W 1 | G 2 | G 6 | Y 5 | B 5 | R 5 |

Y 2 | W 2 | P 4 | P 6 | R 1 | G 1 |


P 2 | G 3 | P 4 | W 3 | G 2 | R 5 |

W 4 | W 5 | W 1 | G 1 | W 2 | G 6 |

P 1 | G 5 | G 4 | Y 3 | Y 1 | R 1 |

B 2 | Y 6 | P 5 | P 3 | R 6 | R 2 |

B 4 | W 6 | P 6 | B 6 | Y 2 | R 3 |

B 3 | Y 4 | B 1 | B 5 | Y 5 | R 4 |
```

Now, we implement the ability to generate random boards

In [8]:
```python
# takes n numbers and n colors and generates a random n x n microrobots board
def generate_random_board(numbers, colors):
        # TODO check if lists are equal in size, error if not
        # TODO generalize to n x n by defining tile size rather than just usin
g 3x3

        # build hashmap to store numbers and colors
        expected_matrix_size = len(numbers) * len(colors)
        hashmap = {}
        for color in colors:
            hashmap[color] = []
            for num in numbers:
                hashmap[color].append(num)

        hashmap_copy = hashmap.copy()

        # generates a random unique (exactly once) set of combinations of
        # numbers and colors and returns them as an instance of Square
        squares = []
        colors_copy = colors.copy()
        while len(colors_copy) > 0:
            # chose random color
            rand_color = random.choice(colors_copy)
            rand_num = random.choice(hashmap_copy[rand_color])
            hashmap_copy[rand_color].pop(hashmap_copy[rand_color].index(rand_n
um))

            squares.append(Square(rand_color, rand_num))

            # now we check if we used last num, if so remove color
            # care, this is terminating condition on while loop
            if len(hashmap_copy[rand_color]) == 0:
                colors_copy.pop(colors_copy.index(rand_color))


        # doouble check if len is as expected
        if len(squares) != expected_matrix_size:
            print("ERROR: You only produced ", len(squares), "squares and we e
xpected", expected_matrix_size)
            return

        # generate 4 arrays of 9
        # The generation of these tiles is obviously not, itself, random. I do
nt this matters because what we are really generating is
        # a random matrix and by randomness of actual color/number combos, fix
ing the placement of the tiles should not impact outcome
        split_squares = np.array_split(squares, 4)
        board = Board(np.array([[Tile(1, split_squares[0].reshape(3,3)), Tile(
2,split_squares[1].reshape(3,3))],
                    [Tile(3,split_squares[2].reshape(3,3)), Tile(4, split_squares
[3].reshape(3,3))]], dtype=np.object).reshape(2,2))

        return board

random_board = generate_random_board([1,2,3,4,5,6], ["W", "R", "B", "P", "Y",
"G"])
random_board.print_board()
```

```
R 6 | R 2 | B 1 | Y 4 | B 6 | R 4 |

Y 3 | P 2 | G 4 | R 5 | Y 1 | G 3 |

W 2 | W 5 | G 2 | G 6 | R 3 | B 5 |

Y 2 | R 1 | Y 6 | W 1 | G 1 | B 2 |

W 6 | Y 5 | W 3 | G 5 | B 4 | P 5 |

W 4 | P 6 | B 3 | P 4 | P 3 | P 1 |
```

Now, let's explore the connectedness of a board.

We consider two squares connected iff

```
- They exist on the same row OR column AND
- They are the the same color OR number
```

Here, we draw the resulting graph of the ACTUAL blackside microrobots board and label it with the associated node values
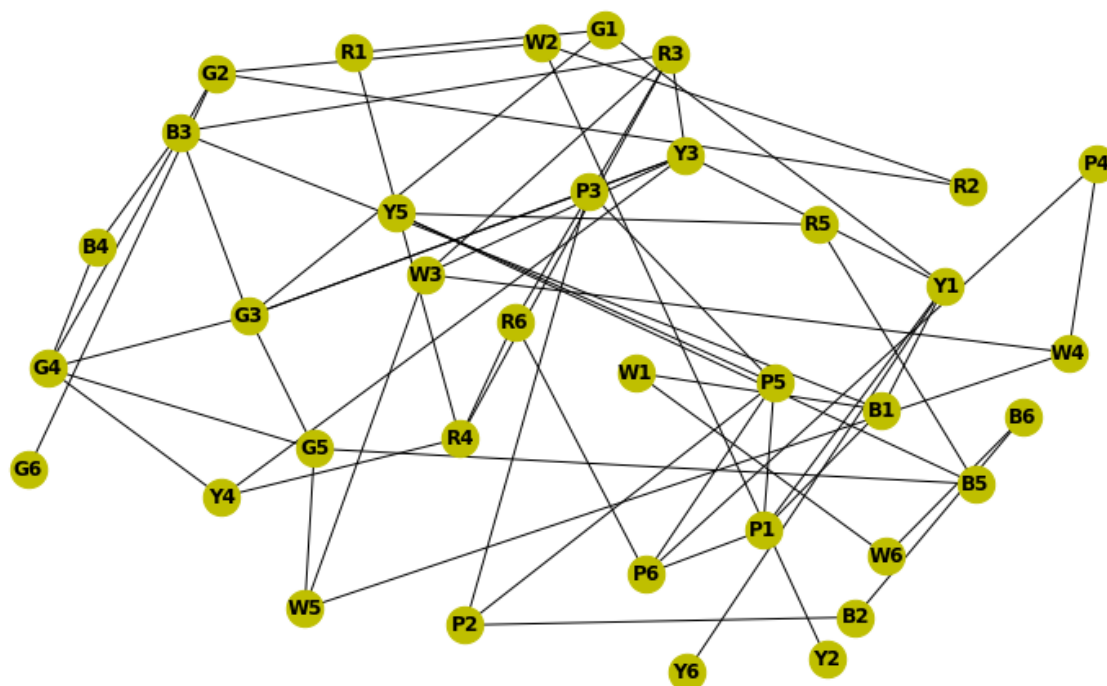
```
In [9]:  blackside_board.build_graph()
         blackside_board.print_graph_characteristics()
         blackside_board.print_graph()
```

```
Graph characteristics:
36 nodes
58 edges
Connected? True
```


Just to make sure we got everything right let's take a look at the adjacency list.

```
In [10]: blackside_board.set_adjacency_dict()
         blackside_board.print_adjacency_dict()
```

```
W6 --> ['W1', 'B6']
B6 --> ['W6', 'B2']
B2 --> ['B6', 'P2']
P5 --> ['P1', 'Y5', 'P6', 'P2', 'P3']
P2 --> ['B2', 'P5', 'P3']
P3 --> ['P5', 'P2', 'Y3', 'G3']
R3 --> ['B3', 'W3', 'R6', 'R4', 'Y3']
Y4 --> ['G4', 'R4', 'Y3']
W3 --> ['R3', 'W5', 'W4', 'Y3']
R6 --> ['R3', 'P6', 'R4']
R4 --> ['R3', 'Y4', 'R6', 'R1']
Y3 --> ['P3', 'R3', 'Y4', 'W3', 'G3', 'Y1']
B3 --> ['R3', 'B1', 'B4', 'G3']
G4 --> ['Y4', 'G2', 'B4', 'G5', 'G3']
W5 --> ['W3', 'W4', 'G5']
B4 --> ['B3', 'G4']
G5 --> ['G4', 'W5', 'B5', 'G3']
G3 --> ['P3', 'Y3', 'B3', 'G4', 'G5', 'G1']
B1 --> ['B3', 'W1', 'P1', 'Y1']
R2 --> ['G2', 'W2']
W4 --> ['W3', 'W5', 'P4']
P1 --> ['P5', 'B1', 'P6', 'Y1']
Y6 --> ['Y1']
Y1 --> ['Y3', 'B1', 'P1', 'Y6', 'G1']
W1 --> ['W6', 'B1']
G2 --> ['G4', 'R2', 'W2', 'G6']
G6 --> ['G2']
Y5 --> ['P5', 'B5', 'R5']
B5 --> ['G5', 'Y5', 'R5']
R5 --> ['Y5', 'B5']
Y2 --> ['W2']
W2 --> ['R2', 'G2', 'Y2']
P4 --> ['W4', 'P6']
P6 --> ['P5', 'R6', 'P1', 'P4']
R1 --> ['R4', 'G1']
G1 --> ['G3', 'Y1', 'R1']
```

Alright, we compared that to the actual board and nothing looks sus!

TESTING RANDOMLY GENERATED THEORY

- We questioned whether, just by nature, these boards tend to be connected even when randomly generated. The answer to that question is no.

Question:

As n grows, either n of randomly generated graphs or actual n x n number of nodes, does the probability of connectedness approach 0 or 1?

KOLMOGOROV'S ZERO-ONE LAW WITH APPLICATIONS

- http://math.uchicago.edu/~may/REU2017/REUPapers/McNamara.pdf (http://math.uchicago.edu/~may/REU2017/REUPapers/McNamara.pdf)

In [11]:
```python
%%time

# generates n random boards with the given numbers & colors arrays
def generate_random_boards(n, numbers, colors):
    boards_list = []
    for x in range(n):
        b = generate_random_board(numbers, colors)
        b.build_graph()
        boards_list.append(b)
    return boards_list

nums = [1,2,3,4,5,6]
cols = ["W", "R", "B", "P", "Y", "G"]
boards_list = generate_random_boards(10, nums, cols)

count_not_connected = 0

for b in boards_list:
    print("\n")
    print(" -------------------------------- ")
    print("\n")
    b.print_board()
    b.print_graph_characteristics()

    if not nx.is_connected(b.graph):
#         b.print_graph()
#         b.set_adjacency_dict()
#         b.print_adjacency_dict()
        count_not_connected = count_not_connected + 1

print("     ===========================================      ")

print(count_not_connected, " out of ", len(boards_list)," graphs were not conn
ected")
```

W 3 | R 5 | P 1 | P 6 | R 3 | Y 6 |

Y 1 | R 4 | B 6 | P 4 | P 2 | G 4 |

R 6 | B 5 | P 3 | G 1 | Y 3 | G 3 |

Y 2 | Y 4 | R 1 | G 6 | G 5 | R 2 |

Y 5 | B 4 | G 2 | W 1 | B 2 | W 5 |

W 6 | P 5 | B 3 | B 1 | W 2 | W 4 |

Graph characteristics:
36 nodes
54 edges
Connected? True

P 1 | G 3 | G 2 | B 4 | Y 5 | Y 2 |

B 3 | P 6 | R 3 | R 5 | P 3 | B 6 |

W 1 | B 2 | B 1 | W 4 | P 4 | W 6 |

W 3 | W 5 | W 2 | G 6 | R 1 | R 2 |

P 5 | Y 1 | P 2 | G 5 | R 4 | G 1 |

B 5 | R 6 | G 4 | Y 4 | Y 6 | Y 3 |

Graph characteristics:
36 nodes
53 edges
Connected? True

W 1 | W 6 | W 3 | P 5 | B 4 | B 2 |

R 5 | P 1 | W 4 | W 5 | G 1 | Y 5 |

B 6 | P 4 | G 3 | W 2 | P 2 | Y 6 |

Y 1 | B 1 | R 2 | G 6 | P 3 | R 1 |

G 2 | B 3 | G 4 | Y 4 | R 3 | R 6 |

Y 2 | P 6 | B 5 | R 4 | G 5 | Y 3 |

Graph characteristics:
36 nodes
46 edges
Connected? False

G 5 | Y 2 | Y 3 | Y 4 | G 3 | G 2 |

P 5 | R 1 | B 5 | G 4 | G 1 | P 3 |

Y 1 | W 1 | G 6 | R 4 | R 3 | P 6 |

B 2 | P 2 | W 5 | Y 5 | B 6 | W 3 |

R 6 | B 4 | Y 6 | B 1 | P 4 | P 1 |

R 5 | B 3 | R 2 | W 2 | W 6 | W 4 |

Graph characteristics:
36 nodes
51 edges
Connected? True

G 6 | Y 3 | G 5 | B 1 | B 5 | B 4 |

W 1 | P 5 | B 2 | W 2 | Y 4 | B 6 |

W 6 | Y 1 | Y 5 | W 3 | P 1 | Y 6 |

P 6 | R 5 | B 3 | G 4 | G 2 | G 1 |

Y 2 | G 3 | R 2 | R 6 | P 2 | R 1 |

W 5 | W 4 | P 4 | P 3 | R 4 | R 3 |

Graph characteristics:
36 nodes
51 edges
Connected? False

G 5 | W 2 | B 4 | B 5 | P 2 | W 4 |

P 1 | Y 5 | B 1 | B 3 | Y 3 | P 3 |

Y 6 | B 6 | B 2 | G 4 | R 4 | Y 2 |

Y 1 | W 6 | Y 4 | R 1 | R 2 | R 5 |

P 6 | G 6 | G 1 | W 1 | G 3 | W 5 |

R 3 | W 3 | G 2 | P 4 | R 6 | P 5 |

Graph characteristics:
36 nodes
61 edges
Connected? True

Y 1 | W 4 | W 3 | W 5 | B 3 | G 2 |

P 4 | P 2 | R 1 | G 5 | W 6 | G 3 |

B 6 | W 2 | P 3 | W 1 | P 1 | B 1 |

R 6 | G 6 | B 4 | P 6 | B 5 | Y 4 |

G 1 | P 5 | G 4 | R 5 | Y 5 | R 3 |

R 2 | Y 6 | B 2 | Y 2 | R 4 | Y 3 |

Graph characteristics:
36 nodes
50 edges
Connected? False

Y 3 | P 5 | G 3 | G 1 | R 4 | W 2 |

G 4 | W 6 | G 5 | P 3 | W 4 | G 6 |

Y 4 | B 1 | R 1 | Y 2 | R 2 | R 5 |

Y 6 | R 6 | W 5 | B 6 | G 2 | P 4 |

R 3 | B 5 | Y 1 | B 4 | P 2 | Y 5 |

P 6 | B 2 | W 1 | W 3 | P 1 | B 3 |

Graph characteristics:
36 nodes
51 edges
Connected? False

```
P 2 | R 3 | B 6 | B 4 | Y 5 | G 3 |

W 3 | Y 3 | W 5 | W 4 | G 1 | P 3 |

W 2 | W 1 | W 6 | G 5 | B 2 | Y 1 |

B 3 | P 1 | G 4 | P 4 | Y 2 | R 2 |

R 4 | Y 4 | B 5 | R 1 | R 5 | P 5 |

B 1 | P 6 | Y 6 | G 2 | R 6 | G 6 |

Graph characteristics:
36 nodes
55 edges
Connected? False


 ---------------------------------


P 4 | R 3 | R 4 | W 6 | Y 3 | P 6 |

R 6 | B 3 | G 4 | W 4 | R 2 | Y 6 |

G 6 | B 4 | G 1 | W 5 | R 1 | G 2 |

W 3 | B 5 | P 3 | P 5 | P 2 | W 1 |

G 5 | P 1 | G 3 | Y 5 | Y 1 | B 6 |

Y 4 | B 1 | W 2 | R 5 | B 2 | Y 2 |

Graph characteristics:
36 nodes
63 edges
Connected? True
    ==============================================
5  out of  10  graphs were not connected
Wall time: 38 ms
```

ANSWERING IF THE ACTUAL GAMEBOARD IS ALWAYS CONNECTED

Next, we examine all of the different permutations of the actual board graph and verify they are all connected

Expected outcome

There are $4!$ ways to place the tiles in the 4 slots. There are 4^4 independent rotations of the individual tiles.

Consider the tile placement without rotation. For each placement, without allowing rotation, there are 3 other equivalent boards. **(add explanation here)**

Consider the tile rotations, each tile has exactly 4 ways of rotating it in place with exactly one other duplicate board created. **(add explanation here)** Therefore, each board is represented by 4 x 4 equivalent arrangements determind by the slot placement and the rotational position of the first tile.

As such, we expect that there are a total of $\frac{4! \times 4^4}{4^2} = 384$ unique boards for four 3×3 tiles.

So expect to see 6144 total boards generated by our program and 5760 of them should be non-unique.

In [12]:
```python
# implement a function which rotates the boards and places them in the associa
ted "slot" until all permutations have been achieved.

def generate_all_permutations(board):
    b = board
    # generate all possible placements with tile one
    tileOne = b.matrix[0][0]
    tileTwo = b.matrix[0][1]
    tileThree = b.matrix[1][0]
    tileFour = b.matrix[1][1]
    tiles = [tileOne, tileTwo, tileThree, tileFour]
    all_placements = list(itertools.permutations(tiles))
    # generate all the rotations per tile placement
    rotations = [0, 90, 180, 270]
    all_rotations = list(itertools.product(rotations, repeat=4))


    all_board_permutations = []
    for placement in all_placements:
        new_board = Board(np.array(placement, dtype=np.object).reshape(2,2))
        all_board_permutations.append(new_board)

        for rotation in all_rotations:
            i00, i01, i10, i11 = rotation
            if (i00 == 0 and i01 ==0 and i10 == 0 and i11 == 0):
                continue
            board_copy = copy.deepcopy(new_board)
            board_copy.matrix[0][0].orient_tile(i00)
            board_copy.matrix[0][1].orient_tile(i01)
            board_copy.matrix[1][0].orient_tile(i10)
            board_copy.matrix[1][1].orient_tile(i11)
            all_board_permutations.append(board_copy)

    # total possible boards will be = permutations_no_rotation * all_rotations
#       print("# of tile placement", len(all_placements))
#       print("# of rotations per tile placement", len(all_rotations))
#       print("# of boards with placements & rotations", len(all_board_permutati
ons))

    for board in all_board_permutations:
        board.build_graph()


    return all_board_permutations

all_blackside_permutations = generate_all_permutations(build_actual_blackside_
microrobots_board())
```

In [13]:
```python
count = 0
for i, x in enumerate(all_blackside_permutations):
    if (nx.is_isomorphic(all_blackside_permutations[0].graph, all_blackside_pe
rmutations[i].graph)):
            count = count + 1

print("non unique boards that exist for blackside board #1", count)


count = 0
for board in all_blackside_permutations:
    if (not board.is_connected()):
            count = count +1

print(count, " blackside boards are not connected")
```

non unique boards that exist for blackside board #1 16
0 blackside boards are not connected

In [19]:
```python
all_copperside_permutations = generate_all_permutations(build_actual_coppersid
e_microrobots_board())

count = 0
for i, x in enumerate(all_copperside_permutations):
    if (nx.is_isomorphic(all_copperside_permutations[0].graph, all_copperside_
permutations[i].graph)):
            count = count + 1

print("non unique boards that exist for copperside board #1", count)


count = 0
for board in all_copperside_permutations:
    if (not board.is_connected()):
            count = count +1

print(count, " copperside boards are not connected")


def check_all_permutations_connected(board):
    b_all_permutations = generate_all_permutations(board)
    for b in b_all_permutations:
        if not nx.is_connected(b.graph):
            return False
    return True
```

non unique boards that exist for copperside board #1 16
0 copperside boards are not connected

```
In [21]:   # check this function to make sure it is correct
           print("These should both return True")
           print(check_all_permutations_connected(blackside_board))
           print(check_all_permutations_connected(copperside_board))
```

```
These should both return True
True
True
```

How many randmoly generated graphs are connected in every iteration?

Generate examples

```
In [23]:  nums = [1,2,3,4,5,6]
          cols = ["W", "R", "B", "P", "Y", "G"]
          boards_list = generate_random_boards(1000, nums, cols)
          strongly_connected = []

          for b in boards_list:
              if nx.is_connected(b.graph):
                  if check_all_permutations_connected(b):
                      print(" =========     Connected in every permutation     ========
          = ")
                      print("")
                      b.print_board()
                  else:
                      print("  =======   Connected in original permutation but not all
          ======= ")
                      print("")
                      b.print_board()
```

```
          ======   Connected in original permutation but not all   =======

R 1 | Y 5 | G 4 | R 6 | R 5 | B 3 |

P 6 | R 2 | B 1 | G 2 | Y 2 | G 6 |

B 5 | W 3 | B 6 | W 2 | R 4 | B 4 |

R 3 | Y 1 | Y 6 | Y 3 | P 3 | G 1 |

B 2 | G 3 | G 5 | P 5 | P 2 | W 6 |

Y 4 | P 4 | P 1 | W 5 | W 1 | W 4 |

          ======   Connected in original permutation but not all   =======

G 2 | W 5 | P 5 | B 5 | B 4 | P 1 |

G 6 | G 1 | R 2 | B 1 | Y 6 | P 6 |

W 6 | W 4 | R 5 | R 6 | B 2 | G 5 |

W 1 | R 3 | R 4 | G 3 | P 3 | W 2 |

P 2 | G 4 | Y 2 | P 4 | B 6 | Y 4 |

W 3 | Y 3 | Y 5 | B 3 | Y 1 | R 1 |

          ======   Connected in original permutation but not all   =======

G 3 | R 6 | G 5 | B 6 | G 2 | P 3 |

P 6 | Y 5 | W 6 | P 5 | P 1 | R 2 |

W 1 | R 3 | W 2 | G 6 | P 2 | G 1 |

G 4 | B 3 | W 5 | W 4 | Y 6 | R 1 |

P 4 | Y 2 | B 1 | B 5 | B 4 | Y 4 |

R 5 | R 4 | B 2 | Y 1 | Y 3 | W 3 |

          ======   Connected in original permutation but not all   =======

W 5 | R 2 | R 4 | G 1 | R 5 | G 5 |

B 6 | Y 4 | B 4 | R 1 | B 2 | Y 6 |

B 1 | W 2 | G 2 | P 5 | P 2 | W 1 |

Y 3 | G 3 | W 3 | Y 2 | Y 5 | G 4 |

R 6 | B 5 | R 3 | B 3 | G 6 | P 3 |

Y 1 | W 4 | W 6 | P 4 | P 6 | P 1 |

          ======   Connected in original permutation but not all   =======
```

```
W 5 | B 4 | W 6 | R 1 | R 2 | P 4 |

Y 2 | Y 6 | W 3 | G 4 | G 3 | W 4 |

P 3 | P 5 | Y 4 | P 6 | R 3 | B 5 |

R 5 | R 4 | B 1 | Y 1 | P 2 | B 6 |

B 2 | P 1 | Y 5 | G 5 | W 1 | W 2 |

G 1 | R 6 | Y 3 | B 3 | G 6 | G 2 |
```

======= Connected in original permutation but not all   =======

```
G 6 | W 5 | Y 3 | B 4 | W 4 | P 5 |

W 2 | B 3 | W 1 | P 2 | Y 6 | G 1 |

P 1 | W 3 | W 6 | R 3 | Y 4 | P 3 |

R 1 | Y 2 | R 4 | G 5 | R 6 | G 3 |

P 4 | R 5 | Y 1 | G 4 | B 5 | B 6 |

P 6 | Y 5 | G 2 | R 2 | B 2 | B 1 |
```

======= Connected in original permutation but not all   =======

```
G 2 | R 2 | G 1 | W 5 | R 6 | W 3 |

R 3 | G 4 | B 4 | R 5 | Y 1 | P 5 |

B 5 | W 6 | W 1 | R 1 | P 1 | G 6 |

G 5 | P 4 | W 2 | Y 6 | Y 5 | R 4 |

G 3 | W 4 | B 6 | P 6 | Y 4 | B 1 |

Y 2 | B 2 | P 3 | Y 3 | P 2 | B 3 |
```

======= Connected in original permutation but not all   =======

```
P 1 | R 3 | W 6 | G 5 | Y 6 | B 1 |

W 1 | G 4 | R 2 | R 4 | R 6 | P 2 |

W 3 | Y 5 | P 5 | P 6 | B 3 | B 4 |

G 1 | R 1 | G 6 | W 5 | Y 2 | B 2 |

B 6 | R 5 | B 5 | W 4 | Y 1 | Y 3 |

G 3 | G 2 | W 2 | P 4 | P 3 | Y 4 |
```

======= Connected in original permutation but not all   =======

```
P 5 | P 2 | Y 3 | B 2 | G 2 | B 6 |

R 2 | P 4 | W 1 | P 6 | B 3 | Y 2 |

W 2 | W 3 | R 5 | P 1 | P 3 | B 4 |

W 5 | R 6 | W 4 | W 6 | G 5 | R 3 |

G 6 | B 5 | Y 1 | G 4 | G 1 | Y 4 |

R 1 | B 1 | R 4 | G 3 | Y 5 | Y 6 |
```

=======   Connected in original permutation but not all   =======

```
R 3 | R 4 | B 1 | B 4 | Y 1 | B 3 |

W 1 | R 2 | B 6 | R 6 | Y 4 | P 3 |

W 4 | P 6 | P 2 | R 5 | R 1 | G 4 |

P 1 | Y 3 | W 2 | Y 2 | W 6 | W 5 |

B 2 | G 6 | B 5 | G 2 | Y 5 | G 1 |

P 4 | P 5 | Y 6 | W 3 | G 5 | G 3 |
```

=======   Connected in original permutation but not all   =======

```
Y 3 | Y 5 | R 5 | Y 6 | R 4 | P 3 |

P 6 | W 4 | Y 4 | R 2 | G 5 | W 5 |

P 2 | W 2 | Y 2 | Y 1 | P 5 | B 4 |

B 1 | G 2 | R 1 | B 2 | W 1 | B 3 |

R 3 | W 6 | B 6 | B 5 | P 1 | G 1 |

R 6 | W 3 | G 6 | G 4 | P 4 | G 3 |
```

=======   Connected in original permutation but not all   =======

```
P 6 | Y 3 | B 1 | B 6 | W 2 | G 3 |

G 6 | P 4 | P 1 | P 2 | B 4 | B 3 |

B 5 | Y 4 | B 2 | P 3 | Y 5 | W 5 |

G 1 | W 4 | Y 2 | R 5 | R 1 | G 2 |

R 3 | P 5 | R 4 | G 5 | W 1 | W 3 |

Y 1 | R 6 | R 2 | Y 6 | G 4 | W 6 |
```

=======   Connected in original permutation but not all   =======

```
P 1 | Y 3 | Y 5 | G 3 | Y 1 | W 3 |
```

```
Y 6 | W 6 | Y 4 | W 4 | Y 2 | B 1 |

G 1 | B 6 | R 6 | B 2 | R 2 | W 5 |

B 3 | R 1 | R 4 | G 6 | P 4 | B 5 |

R 3 | P 3 | G 5 | B 4 | R 5 | W 2 |

G 4 | G 2 | P 5 | W 1 | P 2 | P 6 |
```

======= Connected in original permutation but not all   =======

```
W 2 | W 3 | B 4 | B 6 | W 6 | R 3 |

G 4 | B 1 | P 3 | W 5 | G 5 | B 3 |

W 1 | P 6 | Y 3 | P 5 | G 2 | W 4 |

B 2 | Y 4 | R 4 | G 6 | R 2 | Y 6 |

R 6 | B 5 | G 3 | R 5 | Y 2 | P 2 |

G 1 | R 1 | P 1 | P 4 | Y 1 | Y 5 |
```

======= Connected in original permutation but not all   =======

```
G 3 | R 6 | G 6 | G 2 | G 4 | B 3 |

G 5 | Y 3 | G 1 | B 6 | Y 1 | Y 4 |

B 5 | R 3 | B 2 | B 1 | Y 6 | P 4 |

W 3 | Y 5 | Y 2 | R 5 | R 4 | P 3 |

W 2 | R 1 | B 4 | P 1 | P 6 | P 2 |

W 4 | R 2 | P 5 | W 6 | W 1 | W 5 |
```

======= Connected in original permutation but not all   =======

```
G 3 | B 5 | P 3 | R 4 | P 4 | R 1 |

Y 6 | R 3 | B 1 | R 6 | W 3 | R 2 |

W 1 | G 2 | B 3 | P 1 | B 4 | G 6 |

R 5 | P 2 | W 6 | Y 4 | W 5 | Y 3 |

W 2 | P 5 | B 2 | P 6 | G 5 | Y 5 |

B 6 | W 4 | G 4 | G 1 | Y 2 | Y 1 |
```

======= Connected in original permutation but not all   =======

```
B 2 | R 5 | R 2 | Y 2 | W 4 | B 4 |
```

```
G 6 | G 5 | G 4 | P 3 | G 1 | R 6 |

R 3 | B 1 | G 3 | Y 4 | G 2 | Y 1 |

R 1 | P 2 | R 4 | W 5 | W 3 | P 4 |

Y 6 | Y 5 | B 6 | B 3 | P 6 | W 6 |

P 1 | Y 3 | B 5 | W 2 | W 1 | P 5 |
```

    =======   Connected in original permutation but not all   =======

```
G 5 | B 4 | R 5 | R 2 | P 4 | R 4 |

W 2 | B 3 | Y 5 | B 2 | G 4 | B 1 |

B 6 | W 4 | G 2 | P 6 | G 1 | B 5 |

W 1 | R 6 | Y 4 | P 1 | W 3 | W 6 |

G 6 | G 3 | R 3 | R 1 | P 3 | Y 6 |

Y 1 | W 5 | P 2 | P 5 | Y 3 | Y 2 |
```

    =======   Connected in original permutation but not all   =======

```
W 4 | P 1 | W 3 | W 5 | G 5 | B 6 |

G 1 | W 1 | R 1 | B 1 | W 2 | W 6 |

B 2 | R 5 | R 3 | Y 3 | P 2 | R 6 |

Y 5 | Y 4 | B 5 | B 3 | P 4 | B 4 |

P 5 | G 2 | P 3 | G 6 | Y 6 | P 6 |

R 4 | Y 1 | R 2 | Y 2 | G 4 | G 3 |
```

    =======   Connected in original permutation but not all   =======

```
P 2 | W 5 | W 2 | Y 5 | Y 3 | B 2 |

W 4 | P 1 | B 6 | R 5 | R 4 | Y 2 |

B 3 | B 1 | R 1 | Y 1 | G 5 | G 3 |

G 2 | R 6 | W 3 | P 3 | W 6 | R 3 |

B 5 | W 1 | P 6 | P 4 | G 4 | Y 4 |

B 4 | G 6 | R 2 | G 1 | P 5 | Y 6 |
```

    =======   Connected in original permutation but not all   =======

```
W 1 | B 1 | P 4 | B 5 | Y 3 | G 6 |

Y 1 | W 5 | P 1 | R 4 | P 2 | B 2 |
```

```
P 5 | Y 5 | P 6 | G 2 | P 3 | W 4 |

W 3 | B 6 | Y 4 | R 5 | G 4 | R 3 |

B 3 | B 4 | G 1 | R 2 | G 5 | W 2 |

Y 6 | Y 2 | R 1 | W 6 | R 6 | G 3 |

   =======   Connected in original permutation but not all   =======

W 6 | G 6 | P 5 | G 5 | B 6 | G 3 |

R 5 | P 2 | B 2 | R 2 | W 3 | B 1 |

R 4 | G 1 | P 3 | W 4 | R 6 | P 4 |

B 3 | R 1 | P 6 | Y 5 | Y 3 | R 3 |

B 4 | Y 4 | P 1 | G 2 | W 1 | Y 2 |

G 4 | W 5 | B 5 | W 2 | Y 6 | Y 1 |

   =======   Connected in original permutation but not all   =======

P 4 | W 6 | G 1 | Y 6 | G 4 | W 2 |

B 4 | G 3 | R 2 | P 1 | W 4 | W 3 |

G 2 | P 5 | B 6 | Y 4 | R 4 | P 3 |

G 6 | G 5 | P 6 | B 5 | R 5 | R 1 |

P 2 | B 2 | R 3 | B 1 | Y 3 | R 6 |

W 1 | Y 2 | W 5 | B 3 | Y 5 | Y 1 |

   =======   Connected in original permutation but not all   =======

W 6 | R 3 | R 4 | B 4 | P 3 | B 2 |

B 1 | P 5 | Y 2 | R 2 | G 2 | R 6 |

B 5 | Y 3 | R 1 | P 2 | B 6 | Y 1 |

B 3 | R 5 | W 4 | Y 6 | W 5 | P 6 |

G 6 | G 4 | G 1 | W 2 | P 1 | P 4 |

G 3 | Y 4 | Y 5 | W 3 | G 5 | W 1 |

   =======   Connected in original permutation but not all   =======

W 2 | W 6 | B 2 | B 6 | G 3 | P 6 |

G 1 | W 5 | W 1 | Y 1 | G 6 | R 5 |
```

```
W 3 | G 5 | Y 6 | G 4 | Y 5 | B 4 |

B 3 | R 3 | B 1 | Y 4 | R 4 | B 5 |

W 4 | P 3 | G 2 | R 2 | R 1 | P 2 |

P 4 | P 1 | R 6 | Y 3 | Y 2 | P 5 |
```

   =======   Connected in original permutation but not all   =======

```
P 4 | W 6 | R 1 | W 2 | Y 2 | P 1 |

P 5 | W 1 | W 3 | G 4 | G 3 | P 2 |

G 1 | R 4 | P 6 | G 6 | W 5 | G 5 |

Y 5 | R 5 | P 3 | Y 1 | R 2 | R 3 |

B 1 | B 5 | Y 3 | R 6 | B 4 | G 2 |

Y 4 | Y 6 | B 6 | B 2 | B 3 | W 4 |
```

   =======   Connected in original permutation but not all   =======

```
W 5 | P 4 | W 1 | G 1 | W 3 | Y 5 |

Y 2 | Y 4 | Y 3 | R 4 | G 4 | W 2 |

Y 6 | W 6 | R 1 | W 4 | G 3 | Y 1 |

P 3 | B 1 | B 5 | P 6 | B 2 | R 2 |

G 2 | P 1 | G 6 | B 4 | B 6 | P 5 |

R 3 | G 5 | B 3 | P 2 | R 6 | R 5 |
```

   =======   Connected in original permutation but not all   =======

```
R 6 | Y 6 | P 5 | W 4 | Y 5 | B 2 |

P 2 | R 4 | W 3 | Y 4 | W 1 | G 3 |

G 1 | P 4 | R 3 | Y 3 | G 5 | R 1 |

P 6 | Y 1 | Y 2 | P 3 | B 4 | G 4 |

W 6 | R 2 | B 5 | B 6 | G 2 | G 6 |

R 5 | B 3 | P 1 | B 1 | W 5 | W 2 |
```

   =======   Connected in original permutation but not all   =======

```
G 5 | P 3 | B 5 | W 1 | Y 5 | Y 1 |

R 1 | G 1 | G 3 | R 4 | W 5 | Y 2 |

R 2 | R 3 | R 5 | R 6 | P 1 | B 3 |
```

```
W 6 | Y 3 | B 4 | G 6 | P 4 | W 2 |

Y 6 | B 2 | P 6 | P 5 | P 2 | G 2 |

Y 4 | W 3 | B 6 | G 4 | B 1 | W 4 |

   =======   Connected in original permutation but not all   =======

Y 6 | W 3 | R 1 | B 5 | R 2 | P 1 |

R 6 | R 5 | W 4 | W 6 | R 3 | P 4 |

R 4 | B 1 | P 2 | G 5 | W 5 | W 2 |

G 4 | W 1 | Y 4 | P 6 | G 3 | B 3 |

G 1 | G 6 | G 2 | B 2 | P 3 | P 5 |

Y 1 | Y 3 | Y 2 | Y 5 | B 6 | B 4 |

   =======   Connected in original permutation but not all   =======

B 3 | B 6 | G 6 | R 5 | B 5 | R 1 |

R 2 | G 4 | P 2 | Y 2 | P 3 | B 2 |

P 5 | B 4 | W 1 | P 1 | Y 1 | P 6 |

G 5 | R 3 | R 4 | P 4 | Y 3 | Y 6 |

Y 5 | R 6 | G 1 | Y 4 | W 2 | W 4 |

B 1 | G 3 | G 2 | W 6 | W 3 | W 5 |

   =======   Connected in original permutation but not all   =======

G 3 | P 2 | P 6 | B 3 | B 5 | W 1 |

G 4 | R 3 | P 3 | G 5 | P 1 | B 1 |

G 2 | G 6 | P 4 | P 5 | R 1 | W 3 |

B 2 | R 6 | R 5 | Y 6 | Y 5 | B 6 |

W 2 | W 6 | W 4 | R 4 | R 2 | B 4 |

G 1 | Y 4 | W 5 | Y 1 | Y 3 | Y 2 |

   =======   Connected in original permutation but not all   =======

Y 6 | B 3 | W 1 | B 2 | R 2 | Y 4 |

R 4 | R 3 | G 5 | Y 5 | R 1 | G 4 |

Y 1 | B 6 | B 4 | W 6 | G 1 | P 5 |
```

```
R 6 | G 3 | W 3 | W 5 | P 4 | Y 3 |

R 5 | B 1 | P 6 | P 2 | Y 2 | P 3 |

G 2 | B 5 | G 6 | P 1 | W 4 | W 2 |

    =======   Connected in original permutation but not all    =======

R 2 | G 3 | R 4 | B 3 | Y 2 | W 2 |

R 3 | Y 5 | R 1 | P 3 | B 2 | G 1 |

G 5 | B 1 | Y 1 | B 5 | W 4 | Y 6 |

R 5 | W 5 | B 4 | W 1 | Y 3 | G 2 |

W 6 | R 6 | Y 4 | G 4 | P 6 | P 1 |

W 3 | B 6 | P 5 | G 6 | P 4 | P 2 |

    =======   Connected in original permutation but not all    =======

W 6 | R 2 | G 4 | P 6 | B 6 | B 4 |

W 4 | B 2 | P 2 | W 3 | G 3 | R 1 |

B 3 | P 1 | W 1 | R 4 | Y 1 | W 2 |

P 3 | B 5 | G 1 | W 5 | R 3 | G 5 |

Y 4 | G 6 | R 5 | P 4 | P 5 | R 6 |

B 1 | G 2 | Y 3 | Y 2 | Y 6 | Y 5 |

    =======   Connected in original permutation but not all    =======

W 3 | P 4 | R 5 | P 1 | P 2 | R 3 |

W 6 | G 1 | Y 1 | Y 4 | G 5 | G 3 |

W 4 | Y 6 | B 2 | Y 5 | R 2 | P 5 |

R 4 | B 1 | W 1 | B 3 | G 6 | W 2 |

Y 3 | Y 2 | G 2 | B 4 | R 6 | B 6 |

B 5 | R 1 | G 4 | W 5 | P 6 | P 3 |

    =======   Connected in original permutation but not all    =======

R 6 | R 2 | W 6 | B 2 | W 4 | Y 6 |

P 5 | G 2 | Y 2 | R 5 | R 1 | R 3 |

R 4 | W 3 | Y 3 | G 4 | W 5 | W 2 |

Y 1 | W 1 | P 6 | B 3 | P 4 | Y 5 |
```

```
G 1 | G 5 | P 2 | G 6 | P 1 | Y 4 |

B 1 | G 3 | B 6 | P 3 | B 5 | B 4 |
```

   =======   Connected in original permutation but not all   =======

```
W 3 | G 6 | R 5 | G 4 | W 1 | G 2 |

P 3 | W 6 | W 2 | Y 3 | W 4 | Y 1 |

Y 2 | W 5 | R 4 | R 6 | Y 5 | G 3 |

B 2 | Y 4 | Y 6 | P 6 | B 5 | B 6 |

P 1 | R 1 | R 3 | P 4 | G 1 | P 2 |

G 5 | P 5 | R 2 | B 4 | B 1 | B 3 |
```

   =======   Connected in original permutation but not all   =======

```
G 3 | W 4 | G 4 | Y 2 | G 1 | W 1 |

R 4 | W 6 | B 5 | Y 3 | R 5 | R 1 |

P 3 | R 6 | W 3 | B 1 | P 6 | P 4 |

G 2 | P 2 | W 5 | B 4 | B 6 | B 3 |

P 5 | P 1 | W 2 | Y 6 | Y 1 | Y 4 |

G 5 | R 2 | G 6 | Y 5 | B 2 | R 3 |
```

   =======   Connected in original permutation but not all   =======

```
Y 2 | P 6 | W 1 | Y 4 | R 3 | R 6 |

Y 3 | B 3 | G 4 | P 1 | P 5 | G 2 |

G 1 | G 6 | W 5 | G 5 | R 1 | G 3 |

B 2 | W 2 | Y 6 | W 3 | B 4 | B 1 |

B 6 | B 5 | Y 5 | P 2 | R 2 | W 4 |

Y 1 | R 5 | R 4 | W 6 | P 3 | P 4 |
```

   =======   Connected in original permutation but not all   =======

```
P 4 | G 5 | B 4 | R 2 | P 6 | W 4 |

Y 2 | R 3 | W 3 | B 2 | P 2 | W 5 |

P 3 | W 6 | R 5 | W 1 | W 2 | R 1 |

Y 3 | G 6 | B 6 | G 2 | G 4 | G 3 |
```

```
R 6 | P 1 | Y 4 | B 5 | B 3 | Y 1 |

R 4 | G 1 | P 5 | B 1 | Y 6 | Y 5 |

   =======   Connected in original permutation but not all   =======

G 2 | Y 4 | P 6 | Y 1 | B 5 | R 6 |

P 1 | R 5 | W 3 | R 2 | B 3 | Y 2 |

G 5 | B 1 | Y 5 | R 3 | W 6 | G 4 |

W 2 | W 1 | B 4 | B 6 | G 6 | Y 3 |

G 1 | W 4 | P 4 | B 2 | W 5 | Y 6 |

R 4 | R 1 | G 3 | P 5 | P 3 | P 2 |

   =======   Connected in original permutation but not all   =======

R 2 | G 4 | P 4 | G 1 | R 1 | P 6 |

G 2 | G 3 | Y 2 | B 1 | B 2 | W 6 |

R 6 | W 2 | Y 4 | W 4 | Y 1 | R 3 |

P 2 | G 6 | P 5 | W 3 | W 5 | P 3 |

B 5 | Y 6 | B 6 | P 1 | B 4 | G 5 |

R 5 | W 1 | Y 5 | B 3 | Y 3 | R 4 |

   =======   Connected in original permutation but not all   =======

R 2 | G 3 | W 4 | Y 4 | R 6 | B 1 |

Y 6 | P 6 | R 3 | R 1 | P 5 | G 5 |

G 6 | P 1 | G 1 | G 4 | B 6 | Y 3 |

W 5 | W 1 | R 4 | R 5 | B 4 | B 2 |

W 6 | W 2 | G 2 | Y 5 | B 3 | Y 1 |

B 5 | W 3 | P 4 | P 2 | P 3 | Y 2 |

   =======   Connected in original permutation but not all   =======

R 2 | W 1 | B 5 | G 5 | Y 5 | B 4 |

P 4 | G 3 | G 1 | R 1 | G 2 | B 2 |

R 3 | W 3 | R 5 | P 2 | R 6 | P 5 |

P 1 | P 6 | Y 3 | B 3 | W 4 | Y 4 |

G 6 | W 6 | B 1 | Y 6 | Y 1 | P 3 |
```

G 4 | R 4 | B 6 | W 5 | Y 2 | W 2 |

  =======   Connected in original permutation but not all   =======

W 2 | P 5 | B 6 | W 4 | Y 2 | Y 5 |

P 6 | W 3 | B 3 | P 2 | G 2 | W 1 |

R 3 | P 4 | G 1 | P 1 | B 5 | R 1 |

B 1 | W 5 | P 3 | R 6 | Y 1 | R 4 |

B 2 | G 6 | W 6 | R 2 | R 5 | G 5 |

Y 4 | G 4 | B 4 | Y 6 | G 3 | Y 3 |

  =======   Connected in original permutation but not all   =======

B 2 | P 3 | R 5 | Y 6 | W 2 | R 4 |

G 3 | W 5 | P 1 | R 2 | P 4 | G 5 |

Y 1 | W 3 | G 6 | G 2 | P 6 | Y 5 |

P 5 | R 1 | P 2 | W 1 | G 4 | W 6 |

Y 3 | G 1 | Y 2 | B 1 | W 4 | B 5 |

Y 4 | B 4 | R 6 | B 6 | R 3 | B 3 |

  =======   Connected in original permutation but not all   =======

R 3 | B 6 | W 3 | G 1 | P 4 | G 5 |

W 6 | B 2 | R 2 | P 6 | P 1 | W 5 |

Y 3 | R 1 | R 5 | R 6 | W 1 | G 4 |

G 3 | Y 2 | B 1 | Y 5 | Y 4 | Y 6 |

W 2 | R 4 | P 5 | G 2 | Y 1 | P 2 |

B 4 | W 4 | B 3 | G 6 | P 3 | B 5 |

  =======   Connected in original permutation but not all   =======

R 5 | B 2 | R 4 | W 4 | B 6 | W 3 |

W 2 | Y 3 | B 1 | Y 6 | P 3 | W 1 |

B 4 | B 3 | R 1 | R 2 | P 1 | P 6 |

G 3 | W 5 | W 6 | B 5 | G 4 | P 4 |

Y 5 | P 2 | Y 2 | Y 4 | G 6 | R 3 |

P 5 | Y 1 | R 6 | G 1 | G 2 | G 5 |

======= Connected in original permutation but not all ======

P 4 | W 1 | W 6 | G 5 | Y 1 | Y 5 |

P 3 | W 5 | P 2 | B 5 | R 4 | W 3 |

P 6 | W 4 | R 2 | Y 2 | G 1 | W 2 |

R 3 | G 3 | R 1 | Y 6 | R 5 | B 4 |

B 1 | Y 3 | P 5 | B 3 | Y 4 | B 6 |

P 1 | G 6 | R 6 | B 2 | G 4 | G 2 |

======= Connected in original permutation but not all ======

P 2 | G 2 | G 6 | W 3 | G 1 | Y 3 |

P 6 | B 1 | Y 6 | P 5 | B 5 | P 1 |

B 3 | Y 1 | G 5 | R 5 | B 4 | Y 2 |

Y 5 | W 1 | R 6 | P 4 | R 2 | R 4 |

B 2 | Y 4 | B 6 | P 3 | R 3 | G 4 |

W 5 | R 1 | G 3 | W 2 | W 4 | W 6 |

======= Connected in original permutation but not all ======

P 3 | B 5 | P 2 | B 3 | P 5 | Y 5 |

W 6 | Y 2 | G 4 | P 4 | B 4 | Y 1 |

R 5 | B 1 | R 4 | Y 6 | P 1 | R 2 |

B 6 | Y 3 | W 4 | G 6 | W 1 | G 2 |

B 2 | G 5 | P 6 | R 3 | W 3 | W 2 |

R 6 | Y 4 | G 1 | R 1 | W 5 | G 3 |

======= Connected in original permutation but not all ======

B 6 | R 3 | W 2 | R 5 | W 6 | G 1 |

R 4 | Y 2 | G 4 | G 6 | R 1 | W 1 |

G 3 | B 1 | Y 3 | Y 6 | R 6 | Y 1 |

W 3 | R 2 | W 5 | B 3 | B 4 | B 5 |

G 5 | Y 5 | Y 4 | B 2 | P 6 | P 1 |

G 2 | P 4 | W 4 | P 5 | P 2 | P 3 |

```
      =======   Connected in original permutation but not all   =======

P 5 | B 5 | W 6 | B 2 | R 3 | R 1 |

W 5 | P 1 | B 4 | P 4 | P 6 | Y 6 |

B 1 | W 4 | B 3 | P 2 | W 2 | B 6 |

Y 4 | W 1 | R 4 | R 6 | Y 3 | Y 2 |

Y 5 | P 3 | W 3 | G 1 | G 5 | G 4 |

Y 1 | R 5 | R 2 | G 3 | G 6 | G 2 |

      =======   Connected in original permutation but not all   =======

R 3 | P 3 | B 5 | Y 5 | W 4 | Y 3 |

R 1 | R 4 | Y 2 | B 4 | W 6 | W 2 |

B 2 | W 1 | Y 4 | P 1 | B 6 | W 5 |

W 3 | P 2 | G 2 | P 4 | B 3 | Y 6 |

Y 1 | R 5 | P 5 | G 6 | R 6 | G 4 |

R 2 | B 1 | P 6 | G 5 | G 1 | G 3 |

      =======   Connected in original permutation but not all   =======

Y 4 | G 1 | G 5 | Y 1 | P 6 | W 2 |

B 5 | B 6 | R 4 | G 4 | P 4 | G 2 |

B 4 | Y 3 | R 5 | R 3 | P 2 | W 4 |

B 1 | W 3 | W 5 | W 1 | B 3 | R 1 |

G 6 | B 2 | R 2 | P 5 | Y 6 | G 3 |

P 3 | W 6 | R 6 | P 1 | Y 2 | Y 5 |

      =======   Connected in original permutation but not all   =======

W 3 | R 5 | R 3 | P 4 | W 5 | R 4 |

R 1 | R 6 | Y 4 | B 1 | B 5 | R 2 |

W 4 | G 3 | B 6 | Y 6 | W 1 | G 2 |

B 2 | P 1 | G 4 | Y 2 | P 3 | G 1 |

P 2 | Y 1 | Y 3 | P 5 | B 4 | G 6 |

Y 5 | B 3 | P 6 | W 2 | W 6 | G 5 |
```

```
======    Connected in original permutation but not all    =======

B 2 | G 1 | R 3 | G 3 | R 2 | W 4 |

Y 1 | B 5 | W 6 | R 6 | G 5 | Y 6 |

W 1 | G 6 | R 5 | W 5 | Y 4 | P 2 |

P 3 | G 2 | B 1 | Y 3 | P 6 | R 4 |

P 5 | R 1 | B 3 | B 6 | G 4 | W 3 |

P 4 | Y 2 | B 4 | W 2 | Y 5 | P 1 |

   ======    Connected in original permutation but not all    =======

R 2 | R 5 | G 6 | P 5 | B 5 | Y 4 |

P 1 | R 4 | Y 5 | R 6 | R 1 | W 1 |

B 3 | G 4 | Y 2 | R 3 | P 2 | W 5 |

Y 6 | P 3 | B 1 | B 4 | G 5 | W 4 |

Y 1 | P 4 | P 6 | G 3 | G 2 | G 1 |

B 2 | W 6 | Y 3 | W 2 | B 6 | W 3 |

   ======    Connected in original permutation but not all    =======

Y 3 | W 2 | Y 2 | R 2 | R 1 | B 2 |

Y 6 | G 6 | P 6 | B 4 | Y 4 | Y 5 |

Y 1 | G 1 | B 1 | R 3 | W 1 | P 1 |

W 6 | G 4 | B 6 | P 5 | B 5 | W 3 |

W 4 | P 4 | W 5 | G 5 | G 2 | R 5 |

P 2 | P 3 | B 3 | R 6 | R 4 | G 3 |

   ======    Connected in original permutation but not all    =======

B 4 | P 5 | G 3 | R 3 | B 3 | Y 6 |

R 6 | R 4 | B 1 | Y 1 | Y 4 | W 4 |

B 2 | P 3 | Y 5 | B 5 | B 6 | R 5 |

Y 3 | Y 2 | P 1 | P 2 | G 6 | G 2 |

W 1 | W 5 | P 6 | P 4 | G 5 | W 6 |

R 1 | W 3 | R 2 | W 2 | G 4 | G 1 |

   ======    Connected in original permutation but not all    =======
```

```
W 2 | R 3 | R 2 | Y 2 | Y 1 | R 1 |

B 4 | W 3 | Y 3 | P 6 | P 2 | R 6 |

B 2 | R 4 | P 4 | P 3 | B 5 | R 5 |

P 5 | P 1 | B 6 | Y 5 | W 6 | W 5 |

Y 4 | B 1 | W 1 | G 1 | G 2 | G 5 |

W 4 | G 4 | G 6 | G 3 | B 3 | Y 6 |
```

   =======   Connected in original permutation but not all   =======

```
P 5 | B 6 | G 3 | R 4 | R 1 | B 1 |

W 5 | B 5 | B 4 | Y 5 | Y 6 | G 6 |

R 3 | P 3 | W 4 | P 6 | W 6 | P 4 |

G 2 | R 5 | W 3 | P 2 | Y 2 | G 5 |

P 1 | W 2 | B 3 | R 2 | Y 1 | G 1 |

R 6 | W 1 | B 2 | Y 3 | Y 4 | G 4 |
```

   =======   Connected in original permutation but not all   =======

```
R 2 | B 6 | W 4 | B 4 | B 1 | P 3 |

W 3 | W 6 | G 4 | R 4 | R 5 | P 5 |

W 1 | Y 6 | B 2 | B 5 | B 3 | P 1 |

W 5 | Y 2 | Y 3 | Y 1 | W 2 | G 5 |

R 1 | R 3 | P 4 | G 3 | Y 4 | R 6 |

G 1 | G 2 | G 6 | Y 5 | P 2 | P 6 |
```

   =======   Connected in original permutation but not all   =======

```
P 2 | R 3 | R 6 | R 1 | W 6 | P 3 |

R 4 | W 4 | P 6 | G 4 | Y 6 | Y 4 |

G 6 | Y 3 | R 2 | B 6 | R 5 | W 5 |

Y 5 | W 2 | W 3 | Y 2 | B 1 | G 5 |

P 5 | P 1 | W 1 | G 1 | B 3 | G 3 |

P 4 | B 2 | Y 1 | B 5 | B 4 | G 2 |
```

   =======   Connected in original permutation but not all   =======

```
P 4 | B 1 | Y 1 | B 2 | P 1 | P 2 |

G 6 | P 6 | W 5 | P 3 | G 2 | B 3 |

G 3 | Y 4 | G 5 | B 4 | P 5 | Y 2 |

R 3 | R 6 | R 1 | G 4 | Y 6 | B 5 |

G 1 | R 4 | B 6 | W 6 | Y 5 | Y 3 |

W 1 | R 2 | R 5 | W 3 | W 2 | W 4 |
```

      =======   Connected in original permutation but not all   =======

```
W 1 | R 2 | G 2 | B 5 | W 6 | P 2 |

P 6 | Y 5 | R 4 | R 1 | Y 2 | R 3 |

B 6 | R 6 | W 3 | Y 3 | W 2 | R 5 |

B 1 | P 4 | G 4 | W 5 | W 4 | Y 6 |

P 1 | Y 1 | B 3 | Y 4 | P 5 | G 6 |

P 3 | B 2 | B 4 | G 3 | G 1 | G 5 |
```

      =======   Connected in original permutation but not all   =======

```
W 5 | W 6 | Y 2 | P 3 | Y 5 | Y 1 |

Y 4 | R 6 | Y 6 | B 2 | R 2 | R 5 |

W 3 | Y 3 | G 3 | W 1 | G 4 | R 4 |

B 6 | P 4 | R 3 | P 2 | P 6 | G 2 |

G 5 | P 5 | R 1 | G 6 | B 4 | W 4 |

W 2 | G 1 | P 1 | B 5 | B 3 | B 1 |
```

      =======   Connected in original permutation but not all   =======

```
P 3 | G 5 | G 1 | G 3 | Y 5 | P 4 |

Y 6 | G 6 | P 6 | P 5 | R 6 | P 2 |

Y 4 | W 6 | R 2 | R 1 | W 1 | W 5 |

P 1 | R 5 | B 1 | W 2 | W 3 | B 3 |

B 6 | Y 3 | R 4 | B 2 | R 3 | W 4 |

Y 1 | G 4 | G 2 | B 5 | Y 2 | B 4 |
```

      =======   Connected in original permutation but not all   =======

```
R 6 | R 1 | W 5 | R 3 | W 4 | R 2 |
```

```
P 2 | W 3 | Y 6 | G 6 | B 1 | Y 5 |

W 2 | R 5 | R 4 | G 2 | P 1 | P 6 |

W 1 | B 2 | G 5 | B 6 | P 4 | Y 2 |

P 3 | W 6 | B 5 | P 5 | B 3 | Y 1 |

Y 3 | G 3 | B 4 | G 4 | G 1 | Y 4 |

   =======   Connected in original permutation but not all   =======

B 2 | P 3 | P 2 | P 5 | Y 3 | Y 5 |

Y 2 | B 5 | G 6 | P 4 | R 1 | R 2 |

W 5 | G 4 | B 4 | G 5 | G 2 | P 6 |

G 1 | R 5 | G 3 | W 1 | R 4 | R 3 |

P 1 | R 6 | B 6 | W 4 | W 2 | Y 6 |

Y 4 | B 3 | B 1 | W 6 | W 3 | Y 1 |

   =======   Connected in original permutation but not all   =======

Y 6 | Y 2 | W 2 | Y 4 | B 1 | R 2 |

P 2 | Y 1 | G 1 | R 4 | R 3 | W 1 |

P 6 | G 5 | R 5 | P 5 | Y 5 | G 3 |

Y 3 | P 4 | R 6 | W 6 | G 2 | B 2 |

B 3 | R 1 | W 3 | P 3 | B 4 | W 5 |

P 1 | W 4 | G 4 | G 6 | B 5 | B 6 |

   =======   Connected in original permutation but not all   =======

R 4 | B 6 | Y 6 | B 2 | G 1 | W 5 |

P 5 | W 4 | Y 1 | Y 4 | B 3 | P 6 |

Y 3 | B 1 | W 6 | W 2 | G 3 | Y 5 |

B 4 | B 5 | W 3 | R 5 | R 1 | G 6 |

P 1 | P 2 | R 6 | P 4 | P 3 | G 2 |

R 3 | G 4 | R 2 | G 5 | W 1 | Y 2 |

   =======   Connected in original permutation but not all   =======

W 5 | G 5 | R 3 | R 2 | P 2 | R 4 |
```

```
W 1 | Y 2 | W 3 | G 6 | W 4 | R 5 |

Y 5 | W 6 | G 2 | W 2 | R 6 | Y 3 |

P 5 | G 4 | G 3 | B 4 | B 3 | Y 4 |

B 1 | B 5 | Y 6 | B 6 | P 4 | P 6 |

R 1 | B 2 | G 1 | Y 1 | P 1 | P 3 |
```

=======   Connected in original permutation but not all   =======

```
Y 1 | Y 5 | R 3 | B 4 | G 2 | W 6 |

G 3 | B 6 | R 6 | B 1 | G 4 | W 3 |

B 3 | G 6 | P 4 | W 4 | G 1 | G 5 |

W 5 | B 2 | R 1 | P 3 | R 5 | P 2 |

P 6 | W 1 | W 2 | R 4 | R 2 | Y 4 |

P 1 | B 5 | P 5 | Y 3 | Y 2 | Y 6 |
```

=======   Connected in original permutation but not all   =======

```
R 1 | W 5 | P 5 | R 3 | P 1 | Y 2 |

R 2 | G 2 | G 4 | Y 4 | R 6 | B 6 |

Y 5 | G 1 | B 1 | G 5 | B 3 | W 2 |

R 5 | Y 3 | Y 6 | P 4 | G 6 | P 3 |

B 2 | G 3 | R 4 | B 4 | P 2 | W 4 |

P 6 | W 6 | B 5 | Y 1 | W 3 | W 1 |
```

=======   Connected in original permutation but not all   =======

```
B 6 | Y 5 | B 5 | P 4 | B 1 | R 4 |

Y 6 | R 3 | R 5 | Y 2 | R 6 | Y 3 |

Y 1 | Y 4 | P 1 | G 2 | B 2 | R 1 |

G 5 | W 2 | G 1 | P 6 | W 6 | P 3 |

W 1 | R 2 | B 4 | P 2 | B 3 | W 4 |

P 5 | G 4 | G 6 | G 3 | W 3 | W 5 |
```

=======   Connected in original permutation but not all   =======

```
W 4 | R 2 | W 3 | Y 6 | W 2 | W 1 |

G 6 | R 3 | G 4 | P 5 | G 2 | P 6 |
```

```
W 6 | G 3 | P 3 | Y 1 | W 5 | P 1 |

P 4 | Y 2 | P 2 | Y 3 | R 6 | R 4 |

B 4 | B 1 | Y 5 | G 5 | R 5 | R 1 |

Y 4 | B 2 | G 1 | B 6 | B 3 | B 5 |

   =======   Connected in original permutation but not all   =======

W 5 | R 5 | G 6 | G 5 | Y 5 | W 4 |

B 4 | Y 3 | Y 6 | W 6 | W 3 | B 1 |

R 3 | G 4 | Y 2 | Y 4 | W 2 | W 1 |

R 4 | R 6 | R 1 | P 3 | B 5 | B 3 |

G 3 | P 4 | R 2 | P 6 | P 1 | P 2 |

Y 1 | G 1 | G 2 | P 5 | B 6 | B 2 |

   =======   Connected in original permutation but not all   =======

P 6 | P 3 | B 3 | B 4 | G 6 | Y 3 |

R 1 | Y 5 | Y 6 | R 5 | P 1 | B 1 |

R 2 | R 4 | B 2 | B 5 | W 5 | B 6 |

Y 1 | W 3 | P 4 | P 2 | P 5 | G 1 |

G 3 | W 2 | G 2 | G 5 | R 6 | Y 4 |

W 4 | G 4 | Y 2 | W 6 | W 1 | R 3 |

   =======   Connected in original permutation but not all   =======

P 2 | W 1 | W 6 | W 5 | R 2 | P 4 |

W 4 | G 5 | W 3 | W 2 | Y 1 | G 4 |

B 3 | G 3 | G 1 | B 5 | Y 2 | R 4 |

B 6 | Y 4 | B 2 | R 6 | Y 6 | R 1 |

P 6 | B 1 | R 3 | Y 3 | Y 5 | R 5 |

P 5 | B 4 | G 2 | G 6 | P 1 | P 3 |

   =======   Connected in original permutation but not all   =======

G 3 | Y 1 | W 5 | P 3 | W 1 | Y 3 |

B 1 | W 4 | G 2 | B 4 | W 3 | Y 4 |
```

R 3 | G 4 | Y 2 | B 3 | W 2 | Y 6 |

R 4 | W 6 | G 5 | G 1 | P 1 | B 5 |

B 2 | Y 5 | P 5 | G 6 | R 5 | P 4 |

R 2 | R 1 | R 6 | B 6 | P 6 | P 2 |

   =======   Connected in original permutation but not all   =======

P 4 | G 3 | P 3 | P 6 | G 4 | B 1 |

W 5 | Y 1 | R 3 | P 2 | W 1 | G 2 |

R 4 | G 1 | Y 4 | P 1 | G 5 | W 4 |

P 5 | G 6 | W 6 | R 2 | R 1 | Y 2 |

Y 3 | R 5 | Y 5 | Y 6 | B 2 | B 4 |

W 3 | R 6 | W 2 | B 5 | B 3 | B 6 |

   =======   Connected in original permutation but not all   =======

G 6 | B 5 | G 1 | B 3 | R 3 | B 2 |

W 1 | G 4 | Y 5 | R 1 | W 3 | R 6 |

B 4 | W 2 | G 2 | B 1 | R 2 | W 5 |

P 4 | R 5 | Y 4 | P 5 | P 3 | B 6 |

P 6 | W 6 | P 1 | P 2 | Y 6 | R 4 |

W 4 | G 3 | G 5 | Y 1 | Y 3 | Y 2 |

   =======   Connected in original permutation but not all   =======

Y 3 | R 4 | R 5 | B 3 | Y 6 | Y 1 |

B 6 | Y 2 | B 2 | Y 5 | P 6 | B 5 |

R 6 | W 3 | B 1 | G 3 | Y 4 | G 4 |

B 4 | G 1 | W 5 | W 6 | P 1 | W 2 |

G 5 | G 6 | P 4 | P 2 | R 1 | W 1 |

W 4 | R 2 | G 2 | P 3 | P 5 | R 3 |

   =======   Connected in original permutation but not all   =======

G 5 | Y 3 | P 2 | Y 4 | P 5 | G 2 |

P 3 | B 5 | W 3 | B 6 | Y 5 | R 5 |

G 3 | R 6 | R 1 | P 4 | Y 6 | B 1 |

```
P 6 | W 2 | Y 1 | W 5 | W 1 | W 6 |

R 2 | R 3 | W 4 | B 2 | R 4 | B 4 |

P 1 | Y 2 | B 3 | G 4 | G 1 | G 6 |

   =======   Connected in original permutation but not all   =======

G 5 | G 4 | Y 4 | G 6 | W 4 | W 6 |

R 5 | P 3 | B 1 | G 3 | P 2 | G 2 |

P 5 | Y 3 | R 6 | Y 1 | B 5 | W 1 |

W 5 | Y 5 | W 2 | P 6 | B 2 | Y 6 |

B 6 | P 1 | G 1 | R 4 | B 4 | R 1 |

Y 2 | W 3 | R 2 | R 3 | P 4 | B 3 |

   =======   Connected in original permutation but not all   =======

B 5 | G 5 | Y 1 | P 2 | G 6 | B 3 |

B 2 | W 1 | G 2 | P 5 | W 6 | G 4 |

Y 3 | R 3 | P 4 | Y 2 | B 4 | R 4 |

B 6 | G 3 | G 1 | W 3 | P 1 | W 4 |

P 6 | Y 5 | W 5 | P 3 | B 1 | W 2 |

R 5 | Y 6 | R 2 | R 6 | Y 4 | R 1 |

   =======   Connected in original permutation but not all   =======

W 3 | B 6 | R 4 | W 2 | G 2 | R 3 |

P 6 | W 6 | W 1 | G 5 | B 3 | G 4 |

G 3 | R 6 | R 5 | P 1 | P 3 | G 1 |

P 4 | G 6 | B 1 | R 2 | Y 5 | W 5 |

B 5 | R 1 | W 4 | Y 4 | Y 6 | B 4 |

P 5 | P 2 | B 2 | Y 2 | Y 1 | Y 3 |

   =======   Connected in original permutation but not all   =======

G 2 | Y 4 | Y 2 | P 3 | B 1 | R 3 |

P 5 | Y 5 | B 2 | R 1 | W 2 | P 1 |

R 6 | B 4 | G 4 | Y 1 | P 2 | G 5 |
```

B 5 | B 6 | B 3 | R 2 | W 1 | W 4 |

P 4 | P 6 | R 4 | R 5 | W 6 | G 3 |

Y 6 | Y 3 | G 6 | G 1 | W 3 | W 5 |

   =======   Connected in original permutation but not all   =======

W 5 | B 4 | G 1 | B 1 | Y 2 | B 3 |

Y 5 | Y 3 | B 2 | W 4 | R 2 | W 3 |

R 5 | G 2 | P 2 | G 5 | B 6 | B 5 |

Y 6 | G 3 | Y 1 | R 4 | P 4 | R 1 |

W 6 | W 1 | P 5 | Y 4 | R 6 | R 3 |

W 2 | G 4 | G 6 | P 3 | P 6 | P 1 |

   =======   Connected in original permutation but not all   =======

B 6 | G 3 | Y 2 | B 3 | R 4 | Y 5 |

G 6 | B 1 | W 3 | B 5 | R 6 | G 1 |

B 4 | B 2 | W 6 | Y 4 | W 2 | G 4 |

P 4 | P 5 | P 3 | W 1 | Y 3 | W 5 |

Y 6 | Y 1 | G 2 | R 5 | R 1 | R 3 |

P 1 | P 2 | G 5 | P 6 | R 2 | W 4 |

   =======   Connected in original permutation but not all   =======

P 4 | P 1 | Y 1 | P 6 | Y 5 | R 3 |

B 3 | Y 4 | G 6 | G 5 | W 3 | Y 3 |

P 5 | G 1 | B 5 | B 2 | B 6 | W 4 |

B 4 | G 2 | Y 6 | W 1 | W 5 | W 2 |

P 3 | G 3 | Y 2 | R 1 | W 6 | R 5 |

G 4 | B 1 | P 2 | R 2 | R 6 | R 4 |

   =======   Connected in original permutation but not all   =======

P 4 | B 4 | Y 2 | Y 4 | P 3 | B 3 |

W 1 | B 1 | G 4 | P 1 | W 5 | R 6 |

R 4 | B 5 | G 6 | P 6 | B 6 | R 5 |

R 1 | R 3 | Y 3 | G 5 | Y 6 | G 3 |

W 2 | W 3 | W 4 | P 2 | P 5 | B 2 |

G 2 | W 6 | R 2 | G 1 | Y 1 | Y 5 |

   =======   Connected in original permutation but not all   =======

R 3 | G 1 | R 6 | G 3 | G 2 | W 6 |

P 4 | R 2 | B 6 | B 1 | Y 1 | R 5 |

G 6 | B 3 | G 5 | B 5 | W 4 | W 5 |

Y 6 | G 4 | R 4 | P 5 | P 1 | P 6 |

W 2 | B 4 | W 1 | P 2 | W 3 | Y 4 |

P 3 | B 2 | R 1 | Y 5 | Y 3 | Y 2 |

   =======   Connected in original permutation but not all   =======

R 1 | P 5 | P 4 | W 1 | W 3 | R 4 |

Y 2 | B 6 | Y 3 | B 5 | B 3 | P 6 |

G 4 | Y 5 | Y 4 | G 2 | P 2 | R 2 |

R 5 | B 4 | G 3 | Y 6 | P 1 | W 2 |

Y 1 | W 6 | P 3 | R 6 | G 1 | B 1 |

B 2 | G 6 | W 5 | G 5 | W 4 | R 3 |

   =======   Connected in original permutation but not all   =======

W 2 | R 1 | W 6 | B 2 | Y 4 | B 4 |

G 2 | B 5 | G 6 | P 6 | P 3 | B 1 |

G 1 | G 4 | R 3 | P 2 | G 3 | P 1 |

B 6 | G 5 | Y 5 | Y 1 | R 5 | Y 2 |

B 3 | R 4 | W 3 | W 4 | R 6 | P 5 |

Y 6 | R 2 | W 1 | W 5 | P 4 | Y 3 |

   =======   Connected in original permutation but not all   =======

R 4 | P 4 | W 5 | Y 3 | W 6 | B 2 |

G 4 | W 2 | P 6 | B 6 | R 6 | W 4 |

B 3 | Y 6 | W 3 | W 1 | Y 5 | B 5 |

R 5 | B 4 | Y 2 | G 6 | R 2 | G 2 |

```
R 3 | B 1 | Y 1 | P 3 | G 5 | P 5 |

Y 4 | P 1 | P 2 | G 3 | G 1 | R 1 |

   =======   Connected in original permutation but not all   =======

P 3 | R 5 | G 3 | Y 2 | G 4 | G 5 |

Y 4 | Y 6 | W 4 | R 4 | G 6 | G 2 |

R 6 | Y 3 | B 6 | W 1 | W 3 | B 5 |

B 4 | B 1 | G 1 | B 2 | B 3 | P 1 |

Y 1 | P 4 | P 2 | P 6 | P 5 | W 2 |

Y 5 | W 5 | W 6 | R 3 | R 2 | R 1 |

   =======   Connected in original permutation but not all   =======

G 1 | B 4 | P 1 | W 5 | W 1 | G 3 |

G 4 | G 2 | P 2 | W 2 | Y 2 | P 5 |

P 6 | B 3 | W 3 | R 3 | Y 1 | B 5 |

B 6 | W 6 | Y 5 | P 3 | P 4 | Y 6 |

G 5 | G 6 | W 4 | Y 4 | B 1 | R 6 |

R 1 | Y 3 | B 2 | R 2 | R 5 | R 4 |

   =======   Connected in original permutation but not all   =======

G 4 | R 5 | P 4 | W 2 | W 3 | P 2 |

R 6 | G 5 | Y 1 | R 3 | W 5 | P 1 |

P 3 | P 6 | B 6 | P 5 | Y 3 | R 2 |

G 1 | B 3 | R 1 | W 1 | B 1 | Y 4 |

R 4 | Y 6 | B 5 | G 6 | W 6 | W 4 |

Y 2 | B 4 | B 2 | G 3 | G 2 | Y 5 |

   =======   Connected in original permutation but not all   =======

B 1 | G 3 | B 3 | G 1 | P 6 | R 1 |

P 4 | P 2 | W 1 | B 6 | P 3 | W 3 |

W 4 | W 6 | Y 5 | G 2 | Y 4 | R 6 |

W 5 | P 1 | B 5 | R 4 | W 2 | Y 3 |

R 2 | P 5 | Y 2 | B 2 | G 5 | G 4 |
```

Y 1 | R 5 | G 6 | R 3 | Y 6 | B 4 |

  =======   Connected in original permutation but not all   =======

W 5 | W 6 | P 6 | W 1 | W 2 | Y 3 |

B 1 | G 3 | Y 6 | R 6 | P 5 | Y 4 |

R 1 | P 4 | P 3 | G 4 | Y 5 | W 4 |

B 2 | G 6 | B 4 | P 2 | Y 2 | B 5 |

G 2 | B 6 | W 3 | Y 1 | P 1 | R 3 |

G 5 | G 1 | B 3 | R 5 | R 4 | R 2 |

  =======   Connected in original permutation but not all   =======

W 4 | W 3 | W 1 | R 5 | Y 6 | G 1 |

W 5 | G 6 | P 6 | W 6 | P 4 | Y 5 |

G 4 | B 2 | G 3 | Y 1 | G 2 | Y 4 |

B 4 | G 5 | B 6 | P 5 | Y 3 | B 3 |

W 2 | P 1 | B 5 | R 2 | P 2 | R 6 |

R 3 | P 3 | B 1 | R 1 | R 4 | Y 2 |

  =======   Connected in original permutation but not all   =======

G 2 | W 3 | R 5 | Y 6 | R 4 | Y 5 |

Y 4 | B 6 | B 1 | Y 1 | B 5 | P 3 |

Y 2 | G 6 | G 1 | R 6 | B 4 | P 5 |

W 2 | W 1 | R 1 | G 4 | R 3 | P 2 |

Y 3 | B 3 | B 2 | R 2 | W 6 | G 3 |

G 5 | W 4 | W 5 | P 4 | P 6 | P 1 |

  =======   Connected in original permutation but not all   =======

W 5 | W 4 | R 3 | R 5 | Y 4 | G 3 |

W 3 | Y 2 | G 2 | W 1 | P 2 | W 2 |

B 1 | R 2 | Y 6 | P 3 | G 6 | G 1 |

G 4 | W 6 | R 1 | P 1 | B 2 | B 4 |

Y 5 | Y 1 | G 5 | P 6 | P 4 | B 5 |

P 5 | Y 3 | R 4 | B 6 | R 6 | B 3 |

======= Connected in original permutation but not all   =======

W 3 | W 2 | G 1 | R 2 | W 5 | W 1 |

G 3 | P 5 | Y 2 | R 1 | R 3 | R 5 |

R 4 | P 1 | G 5 | B 4 | R 6 | P 4 |

B 6 | B 1 | B 2 | P 2 | G 4 | W 4 |

Y 3 | Y 4 | G 6 | P 3 | G 2 | W 6 |

B 3 | Y 6 | B 5 | P 6 | Y 1 | Y 5 |

======= Connected in original permutation but not all   =======

B 4 | G 2 | Y 5 | B 5 | P 5 | B 6 |

R 3 | Y 3 | W 4 | R 2 | W 1 | P 1 |

B 2 | G 3 | B 3 | P 4 | Y 2 | G 5 |

G 4 | G 6 | G 1 | Y 4 | Y 1 | Y 6 |

P 6 | R 6 | B 1 | R 1 | R 5 | W 5 |

P 3 | R 4 | P 2 | W 3 | W 6 | W 2 |

======= Connected in original permutation but not all   =======

P 1 | B 6 | P 3 | G 4 | P 2 | B 3 |

P 4 | W 6 | W 1 | Y 5 | Y 1 | R 6 |

R 1 | G 5 | B 4 | R 3 | P 5 | B 5 |

G 3 | B 1 | Y 2 | W 2 | W 4 | G 6 |

B 2 | W 3 | P 6 | Y 4 | R 4 | Y 3 |

G 2 | R 5 | W 5 | Y 6 | G 1 | R 2 |

======= Connected in original permutation but not all   =======

B 6 | R 1 | Y 6 | W 1 | B 4 | B 3 |

Y 3 | R 3 | W 2 | R 6 | G 5 | B 2 |

W 4 | W 5 | B 5 | B 1 | W 3 | R 5 |

Y 4 | W 6 | Y 1 | Y 5 | G 4 | Y 2 |

P 4 | G 6 | G 1 | P 5 | G 2 | P 1 |

G 3 | R 4 | R 2 | P 3 | P 6 | P 2 |

```
        =======   Connected in original permutation but not all   =======

R 4 | G 4 | P 1 | G 1 | P 5 | R 2 |

W 2 | R 5 | G 6 | B 2 | G 2 | R 3 |

W 6 | R 6 | Y 3 | W 1 | G 3 | W 4 |

P 6 | B 3 | P 2 | W 5 | P 4 | W 3 |

P 3 | B 6 | G 5 | B 5 | Y 1 | Y 2 |

B 4 | R 1 | Y 6 | B 1 | Y 4 | Y 5 |

        =======   Connected in original permutation but not all   =======

W 4 | G 5 | P 6 | Y 2 | Y 6 | Y 3 |

R 4 | W 1 | Y 5 | R 5 | Y 1 | W 3 |

W 6 | B 1 | R 1 | W 5 | P 4 | R 6 |

Y 4 | P 2 | G 3 | R 2 | G 1 | R 3 |

G 4 | B 6 | W 2 | B 2 | B 4 | G 6 |

B 5 | G 2 | P 3 | P 5 | B 3 | P 1 |

        =======   Connected in original permutation but not all   =======

P 1 | Y 5 | B 2 | Y 6 | B 4 | B 1 |

G 3 | W 5 | Y 4 | Y 1 | W 6 | B 3 |

Y 2 | W 1 | P 3 | Y 3 | B 5 | R 4 |

B 6 | G 4 | G 6 | R 2 | P 4 | W 3 |

G 5 | W 4 | G 2 | W 2 | P 5 | P 6 |

P 2 | G 1 | R 5 | R 1 | R 3 | R 6 |

        =======   Connected in original permutation but not all   =======

R 3 | Y 3 | R 2 | P 5 | W 3 | W 4 |

Y 2 | G 1 | B 5 | G 4 | R 4 | G 5 |

Y 1 | G 6 | R 5 | R 6 | W 5 | G 2 |

W 2 | R 1 | B 2 | W 1 | Y 6 | B 6 |

B 1 | Y 5 | G 3 | P 6 | B 3 | B 4 |

P 3 | W 6 | Y 4 | P 2 | P 4 | P 1 |
```

```
        ======    Connected in original permutation but not all    =======

R 2 | W 1 | R 4 | Y 3 | P 5 | G 4 |

P 1 | Y 6 | P 4 | W 2 | P 6 | B 6 |

W 3 | G 3 | G 6 | P 2 | R 6 | R 3 |

W 4 | Y 2 | W 6 | B 1 | B 4 | B 2 |

R 1 | R 5 | P 3 | G 2 | Y 1 | G 5 |

G 1 | W 5 | B 3 | Y 5 | B 5 | Y 4 |

        ======    Connected in original permutation but not all    =======

B 2 | R 3 | Y 2 | P 1 | Y 3 | B 5 |

W 1 | Y 1 | G 1 | W 5 | G 2 | B 1 |

P 6 | Y 4 | B 6 | Y 6 | W 6 | G 4 |

B 3 | B 4 | W 2 | P 4 | R 2 | P 3 |

Y 5 | G 3 | W 3 | R 4 | R 6 | R 5 |

W 4 | P 2 | R 1 | P 5 | G 6 | G 5 |

        ======    Connected in original permutation but not all    =======

P 6 | B 3 | B 5 | W 5 | Y 2 | P 5 |

Y 4 | B 4 | W 1 | P 4 | R 5 | B 2 |

R 2 | R 3 | W 2 | R 1 | W 3 | G 4 |

B 1 | Y 3 | Y 5 | P 3 | G 5 | P 1 |

Y 6 | R 4 | W 6 | P 2 | Y 1 | B 6 |

R 6 | G 1 | W 4 | G 6 | G 2 | G 3 |

        ======    Connected in original permutation but not all    =======

G 6 | P 6 | B 6 | R 3 | G 1 | R 4 |

R 2 | W 1 | R 6 | R 5 | Y 4 | G 3 |

B 3 | R 1 | B 5 | W 3 | G 4 | B 4 |

P 4 | W 6 | P 5 | P 1 | P 2 | G 5 |

W 4 | W 2 | B 1 | Y 1 | G 2 | Y 3 |

B 2 | W 5 | P 3 | Y 2 | Y 6 | Y 5 |

        ======    Connected in original permutation but not all    =======
```

```
W 4 | R 4 | G 3 | R 2 | R 3 | R 1 |

Y 6 | Y 4 | R 5 | B 6 | B 1 | R 6 |

Y 2 | P 1 | Y 3 | Y 1 | W 2 | B 5 |

Y 5 | B 3 | W 6 | G 4 | G 2 | G 1 |

P 4 | B 2 | G 5 | P 6 | P 5 | P 3 |

G 6 | B 4 | W 3 | W 1 | P 2 | W 5 |

   =======   Connected in original permutation but not all   =======

W 1 | Y 1 | Y 2 | W 5 | W 2 | G 4 |

W 4 | R 4 | B 2 | P 1 | P 5 | G 2 |

P 6 | R 3 | Y 6 | Y 4 | B 4 | B 6 |

P 3 | B 1 | W 3 | R 5 | R 2 | R 1 |

W 6 | Y 5 | B 5 | R 6 | P 2 | G 6 |

Y 3 | B 3 | G 5 | G 3 | P 4 | G 1 |

   =======   Connected in original permutation but not all   =======

P 2 | Y 5 | P 5 | G 4 | G 3 | P 4 |

W 1 | W 2 | B 1 | W 6 | P 3 | R 3 |

P 6 | R 6 | B 2 | R 4 | Y 6 | G 6 |

G 2 | B 6 | P 1 | R 1 | G 5 | B 4 |

Y 2 | B 5 | Y 4 | G 1 | B 3 | W 5 |

Y 3 | Y 1 | W 4 | R 5 | W 3 | R 2 |

   =======   Connected in original permutation but not all   =======

W 1 | P 4 | G 6 | Y 5 | P 3 | Y 2 |

P 2 | W 3 | W 6 | G 5 | G 2 | Y 6 |

R 6 | P 1 | R 3 | G 1 | R 2 | G 3 |

P 5 | W 2 | P 6 | R 1 | B 5 | W 4 |

Y 1 | Y 3 | R 5 | W 5 | B 6 | B 4 |

R 4 | G 4 | Y 4 | B 2 | B 3 | B 1 |

   =======   Connected in original permutation but not all   =======
```

W 1 | W 5 | G 5 | W 4 | G 3 | G 6 |

G 2 | B 5 | P 3 | R 5 | W 2 | B 2 |

Y 1 | P 1 | W 3 | R 4 | W 6 | Y 6 |

P 6 | R 3 | G 1 | P 2 | P 4 | Y 2 |

G 4 | R 2 | P 5 | B 6 | B 3 | Y 4 |

B 4 | R 6 | R 1 | Y 3 | B 1 | Y 5 |

  ==========   Connected in every permutation   =========

P 2 | Y 2 | G 5 | R 5 | R 2 | P 1 |

R 1 | B 6 | R 6 | G 4 | R 3 | B 1 |

P 4 | G 2 | P 5 | B 4 | R 4 | W 4 |

W 6 | W 5 | G 1 | Y 3 | W 2 | B 5 |

P 3 | W 3 | G 3 | Y 6 | B 3 | Y 5 |

G 6 | P 6 | W 1 | Y 1 | B 2 | Y 4 |

   =======   Connected in original permutation but not all   =======

G 4 | W 3 | P 1 | B 3 | Y 1 | B 1 |

W 4 | R 3 | P 4 | R 4 | W 5 | G 5 |

W 6 | P 5 | P 2 | P 6 | P 3 | R 2 |

W 2 | G 6 | G 2 | R 1 | B 6 | R 6 |

W 1 | Y 2 | Y 6 | R 5 | G 3 | Y 3 |

Y 4 | B 5 | G 1 | B 4 | B 2 | Y 5 |

   =======   Connected in original permutation but not all   =======

R 5 | G 2 | W 4 | R 3 | P 5 | R 4 |

W 5 | P 3 | B 5 | P 6 | P 1 | B 6 |

R 1 | P 2 | G 4 | R 6 | W 1 | Y 6 |

W 6 | G 6 | G 3 | P 4 | W 2 | Y 5 |

B 3 | G 1 | Y 2 | Y 3 | W 3 | B 1 |

G 5 | R 2 | B 2 | B 4 | Y 1 | Y 4 |

   =======   Connected in original permutation but not all   =======

G 3 | G 4 | R 5 | W 3 | P 5 | R 4 |

```
P 2 | R 2 | W 5 | W 4 | P 1 | G 2 |

W 6 | R 1 | B 6 | W 1 | P 6 | P 4 |

P 3 | W 2 | G 6 | G 5 | Y 3 | R 6 |

G 1 | B 3 | B 1 | Y 2 | Y 1 | R 3 |

Y 4 | Y 6 | Y 5 | B 5 | B 4 | B 2 |
```

======= Connected in original permutation but not all ======

```
G 5 | Y 4 | B 5 | P 2 | P 4 | B 2 |

P 3 | P 5 | Y 2 | R 4 | Y 6 | P 1 |

W 5 | G 1 | W 3 | Y 1 | W 1 | G 3 |

R 2 | B 3 | R 5 | Y 5 | B 6 | B 4 |

R 6 | G 2 | P 6 | Y 3 | W 2 | R 3 |

G 6 | G 4 | B 1 | W 4 | W 6 | R 1 |
```

======= Connected in original permutation but not all ======

```
W 6 | G 3 | B 1 | Y 2 | Y 6 | P 4 |

W 5 | G 4 | W 4 | Y 1 | W 2 | R 5 |

Y 3 | G 1 | Y 5 | B 4 | R 1 | Y 4 |

P 6 | R 4 | G 2 | R 2 | W 3 | W 1 |

R 3 | B 3 | B 5 | B 6 | R 6 | P 3 |

G 5 | G 6 | B 2 | P 2 | P 5 | P 1 |
```

======= Connected in original permutation but not all ======

```
R 4 | W 6 | R 5 | W 3 | G 4 | W 2 |

B 4 | W 1 | B 1 | W 5 | P 4 | P 6 |

P 2 | R 1 | Y 5 | Y 2 | B 2 | W 4 |

B 6 | R 6 | B 3 | P 1 | Y 1 | G 6 |

P 5 | R 2 | P 3 | Y 3 | G 5 | G 1 |

B 5 | R 3 | Y 4 | G 3 | Y 6 | G 2 |
```

======= Connected in original permutation but not all ======

```
W 3 | P 4 | Y 3 | W 4 | B 2 | B 3 |
```

```
B 4 | W 5 | R 4 | Y 5 | W 6 | P 3 |

G 3 | W 1 | W 2 | G 6 | Y 6 | R 2 |

B 6 | B 5 | B 1 | P 5 | R 1 | R 3 |

R 5 | Y 1 | Y 4 | P 2 | P 6 | P 1 |

R 6 | G 4 | G 2 | Y 2 | G 5 | G 1 |

    =======   Connected in original permutation but not all   =======

P 1 | B 4 | P 3 | R 2 | G 1 | R 3 |

Y 3 | W 3 | R 6 | G 3 | W 5 | B 1 |

P 2 | B 6 | R 1 | Y 4 | R 5 | G 4 |

B 2 | P 4 | Y 2 | G 2 | Y 5 | W 4 |

B 5 | G 6 | B 3 | P 5 | Y 1 | Y 6 |

G 5 | R 4 | P 6 | W 6 | W 2 | W 1 |

    =======   Connected in original permutation but not all   =======

G 5 | R 2 | Y 4 | P 2 | B 5 | Y 1 |

G 6 | B 6 | B 2 | W 5 | R 3 | Y 2 |

P 3 | R 6 | R 1 | B 3 | R 5 | P 1 |

W 4 | P 4 | R 4 | P 6 | W 2 | W 1 |

G 3 | G 4 | G 1 | Y 3 | B 4 | B 1 |

P 5 | G 2 | W 6 | W 3 | Y 5 | Y 6 |

    =======   Connected in original permutation but not all   =======

B 4 | Y 6 | G 1 | G 5 | B 1 | R 4 |

P 3 | Y 2 | B 6 | R 1 | R 6 | Y 1 |

W 3 | G 6 | Y 3 | R 2 | W 2 | B 2 |

R 3 | B 5 | W 6 | R 5 | P 2 | P 6 |

W 1 | P 5 | Y 5 | G 3 | G 2 | G 4 |

Y 4 | P 4 | B 3 | P 1 | W 4 | W 5 |

    =======   Connected in original permutation but not all   =======

P 5 | B 2 | G 6 | R 6 | B 1 | Y 4 |

Y 1 | W 2 | G 1 | B 3 | G 4 | Y 3 |
```

```
W 1 | W 4 | W 6 | B 4 | G 5 | W 5 |

W 3 | B 6 | B 5 | P 4 | P 1 | Y 5 |

P 2 | Y 6 | G 2 | R 3 | R 4 | Y 2 |

P 6 | G 3 | P 3 | R 2 | R 5 | R 1 |
```

   =======   Connected in original permutation but not all   =======

```
Y 1 | B 5 | Y 5 | R 1 | B 6 | R 3 |

W 4 | Y 2 | Y 6 | W 2 | B 2 | R 5 |

B 1 | Y 3 | W 5 | R 6 | R 4 | Y 4 |

P 6 | G 2 | B 3 | W 3 | P 2 | P 5 |

G 5 | R 2 | W 1 | G 4 | P 1 | G 1 |

B 4 | W 6 | P 3 | P 4 | G 6 | G 3 |
```

   =======   Connected in original permutation but not all   =======

```
B 2 | P 3 | B 5 | R 6 | Y 3 | W 2 |

B 6 | W 3 | R 4 | G 6 | G 1 | R 2 |

R 3 | P 4 | G 2 | R 5 | B 3 | G 5 |

G 3 | B 1 | P 6 | Y 6 | W 4 | W 6 |

R 1 | B 4 | P 2 | P 1 | Y 5 | P 5 |

Y 4 | Y 1 | G 4 | Y 2 | W 5 | W 1 |
```

   =======   Connected in original permutation but not all   =======

```
W 3 | B 6 | P 2 | Y 5 | P 3 | Y 4 |

R 6 | Y 1 | P 1 | Y 2 | R 2 | B 3 |

G 4 | B 4 | B 5 | R 4 | P 4 | R 5 |

Y 6 | Y 3 | B 1 | G 1 | R 1 | R 3 |

W 1 | W 4 | W 6 | P 5 | G 2 | P 6 |

B 2 | G 3 | W 2 | W 5 | G 5 | G 6 |
```

   =======   Connected in original permutation but not all   =======

```
W 6 | B 2 | B 3 | P 3 | B 1 | P 5 |

B 5 | G 5 | B 4 | Y 1 | W 5 | Y 3 |
```

```
R 2 | B 6 | W 4 | W 2 | Y 2 | G 6 |

G 1 | G 3 | P 4 | W 3 | G 2 | P 6 |

Y 6 | R 4 | R 3 | G 4 | R 5 | R 1 |

Y 4 | R 6 | W 1 | P 2 | P 1 | Y 5 |
```

=======   Connected in original permutation but not all   =======

```
P 6 | W 3 | B 1 | Y 5 | W 1 | R 4 |

W 5 | W 2 | P 1 | W 6 | G 1 | B 3 |

R 2 | R 3 | P 5 | P 3 | R 5 | R 6 |

W 4 | R 1 | Y 4 | B 5 | B 4 | P 4 |

G 6 | G 3 | P 2 | Y 3 | G 5 | B 2 |

G 2 | Y 2 | G 4 | B 6 | Y 6 | Y 1 |
```

=======   Connected in original permutation but not all   =======

```
G 6 | B 6 | B 4 | Y 5 | R 1 | R 2 |

Y 2 | Y 6 | G 4 | P 4 | W 2 | R 6 |

B 5 | W 4 | W 1 | G 5 | Y 4 | R 3 |

B 2 | P 6 | R 4 | P 3 | R 5 | Y 3 |

B 3 | W 6 | G 1 | G 2 | P 2 | G 3 |

B 1 | P 1 | Y 1 | W 3 | P 5 | W 5 |
```

=======   Connected in original permutation but not all   =======

```
W 4 | G 6 | G 1 | G 2 | R 2 | R 6 |

W 6 | P 2 | P 1 | W 3 | B 5 | W 2 |

G 3 | G 4 | R 4 | B 4 | R 5 | P 4 |

R 3 | P 6 | R 1 | P 5 | P 3 | B 6 |

W 1 | B 2 | W 5 | Y 3 | Y 5 | Y 4 |

G 5 | B 1 | B 3 | Y 6 | Y 2 | Y 1 |
```

=======   Connected in original permutation but not all   =======

```
Y 4 | P 3 | P 6 | B 4 | B 3 | W 4 |

P 2 | R 3 | Y 2 | P 4 | B 2 | B 6 |

W 3 | Y 6 | W 1 | Y 1 | R 6 | R 5 |
```

```
R 1 | Y 5 | R 4 | B 5 | P 1 | P 5 |

Y 3 | R 2 | W 6 | B 1 | G 2 | G 4 |

W 5 | W 2 | G 1 | G 6 | G 5 | G 3 |

   =======   Connected in original permutation but not all   =======

W 4 | P 4 | W 5 | W 6 | B 2 | P 2 |

W 1 | P 3 | W 2 | G 6 | G 5 | B 5 |

R 5 | R 6 | W 3 | P 6 | R 3 | B 3 |

P 1 | B 1 | Y 1 | R 2 | G 2 | G 3 |

P 5 | R 4 | Y 3 | B 4 | R 1 | Y 5 |

Y 2 | B 6 | Y 6 | G 4 | G 1 | Y 4 |

   =======   Connected in original permutation but not all   =======

Y 2 | W 6 | B 5 | G 6 | W 4 | G 1 |

R 4 | Y 6 | G 4 | B 2 | P 5 | B 1 |

Y 3 | W 2 | R 5 | W 3 | Y 5 | G 5 |

B 3 | P 6 | Y 4 | P 1 | Y 1 | P 4 |

B 4 | R 6 | R 1 | G 3 | W 1 | R 2 |

P 2 | W 5 | G 2 | B 6 | P 3 | R 3 |

   =======   Connected in original permutation but not all   =======

Y 6 | Y 2 | P 2 | R 1 | Y 5 | G 6 |

B 4 | R 3 | W 2 | W 4 | R 6 | W 5 |

Y 4 | R 5 | R 4 | B 5 | Y 1 | R 2 |

P 1 | G 5 | G 4 | B 1 | P 4 | B 2 |

Y 3 | B 6 | W 1 | G 3 | G 1 | G 2 |

W 6 | B 3 | P 5 | W 3 | P 6 | P 3 |

   =======   Connected in original permutation but not all   =======

B 6 | R 2 | B 2 | B 4 | W 5 | Y 4 |

W 3 | W 4 | B 5 | R 5 | B 1 | W 2 |

G 2 | W 1 | G 4 | B 3 | P 3 | G 6 |
```

```
Y 1 | G 1 | P 5 | G 3 | G 5 | Y 6 |

R 4 | W 6 | Y 3 | R 3 | P 6 | R 6 |

Y 5 | R 1 | Y 2 | P 4 | P 2 | P 1 |
```

======= Connected in original permutation but not all ======

```
P 4 | P 5 | G 6 | B 1 | B 3 | Y 2 |

P 1 | B 2 | W 1 | W 2 | B 4 | W 4 |

W 3 | W 6 | B 5 | Y 5 | Y 6 | P 2 |

W 5 | B 6 | R 3 | G 2 | G 1 | R 5 |

G 3 | Y 3 | G 5 | P 3 | Y 1 | Y 4 |

P 6 | G 4 | R 1 | R 4 | R 2 | R 6 |
```

======= Connected in original permutation but not all ======

```
Y 6 | R 4 | B 4 | Y 2 | Y 1 | G 5 |

P 2 | P 6 | B 1 | R 2 | Y 4 | B 2 |

B 6 | W 6 | Y 5 | P 1 | B 5 | R 1 |

G 6 | Y 3 | W 5 | P 3 | P 5 | G 4 |

B 3 | W 2 | G 3 | G 1 | P 4 | W 3 |

R 3 | G 2 | W 4 | W 1 | R 6 | R 5 |
```

======= Connected in original permutation but not all ======

```
R 6 | B 1 | P 5 | W 4 | G 2 | P 4 |

G 3 | R 1 | Y 6 | P 2 | B 3 | G 5 |

G 6 | G 4 | W 2 | G 1 | Y 5 | W 5 |

P 1 | W 6 | R 5 | B 5 | W 3 | Y 1 |

R 3 | W 1 | Y 4 | B 2 | R 2 | B 4 |

P 6 | P 3 | Y 3 | R 4 | B 6 | Y 2 |
```

======= Connected in original permutation but not all ======

```
G 3 | P 4 | P 1 | P 6 | R 6 | W 2 |

G 1 | W 1 | G 4 | R 3 | B 4 | P 5 |

G 2 | R 1 | R 2 | W 6 | G 6 | W 5 |

B 2 | W 3 | R 4 | R 5 | B 6 | B 5 |
```

```
Y 4 | Y 2 | Y 3 | Y 6 | B 3 | Y 1 |

G 5 | B 1 | P 3 | Y 5 | P 2 | W 4 |

   =======   Connected in original permutation but not all   =======

P 6 | Y 1 | W 4 | R 3 | Y 6 | R 6 |

B 6 | P 3 | W 6 | Y 3 | R 1 | W 3 |

B 4 | B 5 | W 2 | W 1 | G 3 | Y 2 |

B 1 | Y 4 | R 4 | G 2 | P 1 | G 6 |

B 3 | W 5 | Y 5 | P 2 | G 1 | R 5 |

R 2 | G 5 | B 2 | P 5 | P 4 | G 4 |

   =======   Connected in original permutation but not all   =======

W 6 | Y 6 | W 2 | P 5 | P 1 | G 5 |

B 3 | Y 5 | P 3 | W 1 | W 3 | Y 3 |

W 5 | P 6 | P 4 | P 2 | W 4 | B 5 |

Y 2 | G 4 | B 1 | R 4 | R 1 | Y 4 |

B 6 | B 2 | B 4 | R 6 | Y 1 | R 2 |

G 2 | R 3 | R 5 | G 3 | G 1 | G 6 |

   =======   Connected in original permutation but not all   =======

R 6 | B 3 | R 2 | G 6 | W 6 | B 5 |

R 4 | R 3 | P 5 | P 3 | B 6 | Y 5 |

B 4 | P 1 | B 2 | P 4 | B 1 | Y 3 |

W 5 | Y 1 | P 2 | G 1 | G 2 | R 1 |

R 5 | Y 4 | Y 6 | P 6 | G 3 | W 2 |

G 5 | G 4 | Y 2 | W 1 | W 3 | W 4 |

   =======   Connected in original permutation but not all   =======

P 6 | P 3 | P 2 | G 6 | W 5 | Y 4 |

B 5 | G 3 | R 6 | B 1 | P 1 | G 1 |

B 4 | G 4 | R 3 | G 2 | Y 2 | B 3 |

G 5 | B 2 | R 2 | R 4 | Y 6 | R 5 |
```

W 1 | W 6 | P 4 | Y 1 | W 4 | R 1 |

P 5 | B 6 | W 3 | W 2 | Y 5 | Y 3 |

   =======   Connected in original permutation but not all   =======

B 1 | P 5 | G 1 | R 3 | R 4 | G 3 |

G 5 | W 6 | W 5 | B 2 | Y 1 | W 2 |

P 2 | W 1 | B 4 | B 5 | P 1 | B 3 |

G 2 | G 4 | Y 3 | B 6 | Y 5 | R 1 |

Y 4 | G 6 | P 3 | W 3 | R 6 | P 6 |

W 4 | R 5 | P 4 | Y 6 | Y 2 | R 2 |

   =======   Connected in original permutation but not all   =======

R 6 | R 4 | P 4 | P 3 | W 5 | G 6 |

W 2 | P 2 | G 3 | Y 3 | B 2 | W 3 |

P 1 | Y 6 | Y 1 | P 5 | R 5 | G 1 |

Y 4 | G 2 | P 6 | B 5 | G 4 | W 4 |

B 6 | B 3 | G 5 | Y 2 | R 2 | R 3 |

W 6 | W 1 | Y 5 | B 1 | R 1 | B 4 |

   =======   Connected in original permutation but not all   =======

P 1 | B 6 | W 5 | B 4 | B 1 | Y 3 |

W 6 | P 2 | G 2 | W 3 | R 3 | R 1 |

P 3 | R 4 | W 4 | P 4 | Y 2 | Y 4 |

W 2 | B 2 | P 6 | G 4 | G 6 | Y 1 |

P 5 | Y 5 | B 3 | W 1 | G 1 | R 6 |

Y 6 | R 2 | B 5 | R 5 | G 3 | G 5 |

   =======   Connected in original permutation but not all   =======

G 2 | R 6 | W 6 | R 3 | B 3 | G 5 |

W 5 | Y 2 | R 5 | Y 1 | R 4 | B 1 |

P 1 | W 2 | B 4 | W 3 | W 4 | R 2 |

B 6 | R 1 | Y 3 | P 3 | Y 6 | G 3 |

Y 4 | P 6 | P 2 | G 6 | G 1 | P 4 |

```
W 1 | B 5 | B 2 | P 5 | G 4 | Y 5 |
```

   =======   Connected in original permutation but not all   =======

```
R 2 | P 3 | B 4 | Y 2 | R 4 | B 2 |

P 4 | P 5 | Y 5 | R 6 | W 5 | P 2 |

R 3 | P 6 | P 1 | R 1 | W 1 | W 4 |

W 2 | W 3 | Y 4 | Y 6 | Y 1 | B 6 |

G 5 | W 6 | G 4 | G 2 | G 6 | B 3 |

G 1 | R 5 | Y 3 | G 3 | B 1 | B 5 |
```

   =======   Connected in original permutation but not all   =======

```
Y 5 | P 6 | G 4 | W 6 | W 1 | Y 1 |

G 5 | P 2 | W 5 | Y 6 | G 2 | G 3 |

Y 3 | W 2 | G 6 | Y 2 | G 1 | Y 4 |

W 4 | B 1 | W 3 | B 4 | R 1 | P 5 |

R 4 | R 5 | R 6 | B 5 | R 2 | P 1 |

B 2 | P 3 | B 6 | R 3 | P 4 | B 3 |
```

   =======   Connected in original permutation but not all   =======

```
Y 5 | B 3 | B 1 | R 2 | W 5 | B 2 |

R 3 | R 4 | B 6 | B 5 | B 4 | P 2 |

W 4 | P 5 | Y 3 | R 5 | P 4 | P 3 |

W 1 | Y 1 | Y 4 | G 4 | R 1 | W 2 |

G 2 | Y 6 | Y 2 | W 6 | R 6 | P 6 |

W 3 | P 1 | G 6 | G 1 | G 5 | G 3 |
```

   =======   Connected in original permutation but not all   =======

```
B 2 | R 1 | Y 1 | P 5 | W 2 | G 1 |

R 6 | W 6 | Y 3 | G 6 | W 1 | B 4 |

G 5 | B 3 | R 2 | R 5 | Y 5 | G 4 |

Y 4 | B 6 | B 1 | R 4 | G 2 | R 3 |

W 5 | W 4 | B 5 | P 4 | P 1 | P 2 |
```

```
Y 6 | W 3 | Y 2 | P 6 | G 3 | P 3 |
```

======= Connected in original permutation but not all ======

```
B 4 | G 6 | Y 1 | B 6 | P 2 | Y 5 |

P 3 | R 6 | W 3 | R 1 | Y 4 | B 1 |

W 5 | W 2 | W 4 | P 4 | Y 2 | P 5 |

P 6 | W 1 | B 5 | R 3 | W 6 | G 1 |

G 2 | Y 3 | P 1 | B 3 | G 5 | G 3 |

Y 6 | R 5 | B 2 | R 2 | G 4 | R 4 |
```

======= Connected in original permutation but not all ======

```
R 2 | R 5 | R 3 | Y 4 | W 1 | W 5 |

W 3 | Y 1 | Y 3 | B 6 | B 5 | G 4 |

Y 5 | B 3 | R 6 | P 5 | B 4 | G 1 |

P 3 | Y 2 | G 3 | G 2 | W 4 | P 6 |

Y 6 | G 6 | P 1 | P 4 | P 2 | W 2 |

W 6 | B 1 | G 5 | B 2 | R 1 | R 4 |
```

======= Connected in original permutation but not all ======

```
B 4 | R 3 | B 3 | R 5 | P 5 | G 1 |

G 5 | B 6 | B 1 | R 1 | G 3 | Y 5 |

B 2 | B 5 | Y 6 | G 4 | R 6 | G 2 |

R 2 | G 6 | W 4 | W 3 | W 5 | Y 3 |

Y 4 | R 4 | Y 1 | W 2 | P 1 | P 3 |

W 1 | W 6 | Y 2 | P 2 | P 6 | P 4 |
```

======= Connected in original permutation but not all ======

```
B 5 | P 6 | W 4 | G 3 | R 6 | R 1 |

Y 1 | W 6 | G 6 | R 4 | R 5 | P 3 |

W 5 | B 3 | B 4 | W 1 | R 3 | Y 6 |

B 2 | P 4 | B 1 | P 2 | G 4 | G 1 |

P 5 | Y 2 | R 2 | W 3 | W 2 | Y 5 |

P 1 | G 2 | B 6 | G 5 | Y 4 | Y 3 |
```

```
       =======   Connected in original permutation but not all   =======

B 2 | R 6 | W 5 | R 1 | P 5 | R 4 |

B 3 | B 4 | B 5 | G 2 | W 3 | P 3 |

W 2 | Y 4 | G 3 | B 6 | B 1 | G 1 |

R 2 | P 4 | W 4 | R 3 | P 6 | Y 6 |

P 1 | Y 1 | G 4 | Y 3 | G 5 | Y 5 |

W 1 | W 6 | R 5 | P 2 | G 6 | Y 2 |

       =======   Connected in original permutation but not all   =======

R 3 | Y 1 | P 6 | R 2 | Y 3 | R 6 |

Y 4 | B 6 | G 5 | Y 5 | Y 2 | G 1 |

W 2 | G 4 | R 5 | P 1 | B 5 | R 4 |

W 5 | Y 6 | R 1 | B 2 | B 3 | P 2 |

G 6 | P 3 | G 2 | B 1 | P 5 | W 1 |

W 6 | G 3 | W 4 | P 4 | B 4 | W 3 |

       =======   Connected in original permutation but not all   =======

P 3 | W 1 | B 2 | B 5 | B 1 | R 2 |

W 5 | B 4 | G 1 | G 3 | P 5 | G 4 |

G 2 | R 1 | B 3 | R 6 | P 2 | W 6 |

G 5 | W 2 | B 6 | R 4 | P 6 | Y 4 |

G 6 | W 4 | Y 5 | P 4 | P 1 | R 5 |

Y 3 | W 3 | R 3 | Y 2 | Y 6 | Y 1 |

       =======   Connected in original permutation but not all   =======

B 3 | P 6 | B 2 | Y 5 | P 2 | R 6 |

P 5 | Y 6 | Y 3 | Y 1 | B 5 | R 4 |

P 3 | R 3 | G 2 | G 6 | P 4 | P 1 |

G 5 | W 5 | B 4 | W 2 | R 1 | W 1 |

B 6 | R 5 | Y 4 | G 1 | G 4 | W 6 |

Y 2 | G 3 | W 3 | B 1 | W 4 | R 2 |
```

=======   Connected in original permutation but not all   =======

W 4 | W 1 | G 6 | P 1 | B 5 | G 5 |

P 4 | G 1 | G 3 | R 5 | Y 6 | G 2 |

G 4 | R 6 | B 2 | R 1 | B 6 | R 3 |

B 3 | Y 3 | Y 1 | B 1 | Y 4 | W 6 |

Y 5 | P 3 | R 4 | P 5 | Y 2 | P 6 |

P 2 | R 2 | B 4 | W 2 | W 5 | W 3 |

=======   Connected in original permutation but not all   =======

P 1 | R 6 | B 5 | W 5 | P 5 | G 2 |

P 3 | R 4 | G 1 | B 4 | G 5 | P 4 |

G 4 | W 4 | G 3 | Y 2 | Y 3 | G 6 |

W 1 | P 6 | Y 6 | B 3 | W 2 | B 2 |

Y 5 | W 3 | Y 1 | W 6 | B 6 | R 2 |

P 2 | Y 4 | B 1 | R 3 | R 5 | R 1 |

=======   Connected in original permutation but not all   =======

W 2 | R 4 | W 3 | Y 4 | B 4 | G 3 |

Y 6 | B 3 | P 4 | B 6 | B 2 | G 6 |

G 2 | W 1 | W 4 | B 1 | G 1 | B 5 |

W 6 | Y 1 | R 6 | Y 5 | Y 3 | P 5 |

W 5 | R 1 | R 3 | Y 2 | P 3 | R 5 |

G 4 | G 5 | R 2 | P 2 | P 1 | P 6 |

=======   Connected in original permutation but not all   =======

Y 4 | B 4 | R 4 | R 1 | W 3 | W 6 |

W 4 | P 5 | R 2 | R 6 | B 1 | P 4 |

W 1 | B 5 | P 6 | Y 2 | Y 1 | P 1 |

B 6 | Y 5 | P 2 | B 2 | G 4 | G 5 |

P 3 | G 3 | B 3 | G 6 | R 5 | R 3 |

G 1 | Y 6 | Y 3 | W 5 | W 2 | G 2 |

=======   Connected in original permutation but not all   =======

```
W 3 | B 4 | G 5 | R 6 | W 4 | G 3 |

R 3 | B 5 | P 6 | W 6 | W 2 | G 2 |

P 1 | G 6 | R 5 | G 4 | G 1 | R 1 |

B 3 | Y 4 | P 3 | B 6 | Y 3 | P 5 |

P 2 | R 2 | R 4 | P 4 | W 5 | Y 6 |

W 1 | B 2 | B 1 | Y 2 | Y 5 | Y 1 |

   =======   Connected in original permutation but not all   =======

G 5 | G 4 | W 6 | P 3 | Y 1 | P 5 |

G 6 | P 4 | Y 3 | B 1 | P 1 | W 5 |

Y 2 | G 2 | Y 6 | W 1 | R 5 | R 3 |

P 2 | R 6 | B 6 | W 2 | R 1 | Y 5 |

R 4 | R 2 | B 5 | G 1 | P 6 | B 4 |

G 3 | B 3 | W 3 | B 2 | W 4 | Y 4 |

   =======   Connected in original permutation but not all   =======

Y 3 | W 4 | W 5 | B 4 | G 4 | Y 4 |

R 4 | Y 6 | B 2 | W 6 | B 5 | W 1 |

P 3 | R 1 | G 2 | Y 1 | G 3 | Y 2 |

B 6 | B 3 | R 3 | R 2 | P 5 | W 3 |

B 1 | W 2 | P 2 | P 1 | G 6 | P 6 |

R 5 | Y 5 | R 6 | P 4 | G 5 | G 1 |

   =======   Connected in original permutation but not all   =======

P 4 | G 1 | B 1 | G 5 | Y 1 | G 4 |

R 5 | G 3 | B 4 | W 2 | Y 3 | B 6 |

R 2 | R 1 | Y 6 | G 2 | G 6 | Y 2 |

Y 4 | P 3 | R 6 | P 1 | P 5 | P 2 |

Y 5 | W 1 | B 5 | P 6 | B 3 | R 3 |

W 3 | W 4 | W 5 | R 4 | W 6 | B 2 |

   =======   Connected in original permutation but not all   =======
```

```
B 5 | B 1 | B 6 | Y 5 | Y 2 | W 6 |

R 2 | P 3 | R 5 | G 6 | G 3 | R 6 |

P 1 | R 1 | B 3 | R 4 | R 3 | W 5 |

W 2 | G 2 | G 1 | B 2 | W 1 | W 4 |

W 3 | G 5 | Y 4 | P 5 | P 4 | B 4 |

P 2 | G 4 | Y 1 | Y 3 | P 6 | Y 6 |
```

======= Connected in original permutation but not all   =======

```
R 5 | B 5 | Y 1 | W 3 | W 1 | G 2 |

P 3 | B 1 | R 2 | B 2 | P 1 | G 3 |

B 6 | W 4 | R 6 | Y 5 | P 4 | Y 4 |

W 6 | P 5 | Y 6 | P 6 | W 5 | R 3 |

Y 3 | Y 2 | R 4 | G 5 | G 1 | R 1 |

P 2 | W 2 | B 3 | G 4 | G 6 | B 4 |
```

======= Connected in original permutation but not all   =======

```
R 2 | Y 6 | G 4 | G 2 | Y 2 | W 6 |

B 2 | G 1 | W 2 | Y 3 | Y 1 | G 5 |

W 4 | B 4 | Y 4 | P 2 | G 3 | W 3 |

W 1 | B 1 | W 5 | R 6 | Y 5 | P 3 |

G 6 | B 6 | P 6 | R 1 | B 3 | P 5 |

P 1 | R 4 | B 5 | R 3 | R 5 | P 4 |
```

======= Connected in original permutation but not all   =======

```
B 6 | Y 4 | P 4 | G 3 | Y 3 | R 2 |

W 4 | B 2 | W 5 | R 3 | P 5 | W 3 |

B 1 | G 2 | P 2 | Y 5 | G 5 | G 6 |

P 1 | R 6 | Y 1 | W 6 | R 1 | P 6 |

Y 2 | B 5 | Y 6 | R 4 | R 5 | B 3 |

G 4 | W 1 | G 1 | P 3 | B 4 | W 2 |
```

======= Connected in original permutation but not all   =======

```
G 3 | G 5 | Y 1 | G 2 | Y 5 | P 5 |
```

```
G 1 | R 5 | G 6 | Y 2 | B 1 | W 3 |

G 4 | B 5 | W 6 | P 3 | W 2 | W 5 |

R 2 | R 1 | W 1 | R 4 | B 6 | P 4 |

B 4 | W 4 | R 6 | Y 3 | Y 6 | P 2 |

B 2 | B 3 | P 6 | R 3 | Y 4 | P 1 |
```
  ======= Connected in original permutation but not all =======
```
R 2 | P 1 | B 4 | Y 1 | P 5 | G 5 |

G 2 | R 1 | G 6 | G 3 | Y 5 | Y 2 |

P 2 | G 1 | W 5 | Y 6 | R 4 | B 2 |

P 4 | B 1 | W 4 | P 3 | B 6 | W 6 |

Y 3 | G 4 | W 3 | B 3 | B 5 | R 3 |

R 5 | P 6 | Y 4 | W 1 | R 6 | W 2 |
```
  ======= Connected in original permutation but not all =======
```
W 5 | Y 5 | B 5 | W 6 | P 2 | P 6 |

B 3 | G 4 | W 1 | B 4 | W 4 | G 1 |

W 3 | P 3 | W 2 | R 6 | Y 1 | B 2 |

P 1 | R 3 | B 6 | R 1 | Y 3 | Y 4 |

G 2 | R 4 | B 1 | Y 2 | G 5 | R 5 |

Y 6 | P 5 | R 2 | G 6 | P 4 | G 3 |
```
  ======= Connected in original permutation but not all =======
```
Y 5 | B 2 | P 2 | W 2 | G 4 | R 3 |

Y 2 | R 2 | G 3 | W 1 | B 6 | B 5 |

P 5 | B 4 | R 5 | G 6 | B 3 | W 4 |

B 1 | Y 6 | R 1 | Y 3 | W 5 | P 1 |

Y 4 | G 1 | Y 1 | G 2 | W 6 | P 4 |

P 6 | W 3 | G 5 | P 3 | R 4 | R 6 |
```
  ======= Connected in original permutation but not all =======
```
P 4 | Y 4 | B 6 | W 6 | R 6 | P 6 |
```

```
W 1 | Y 3 | P 5 | B 2 | R 5 | W 5 |

B 1 | W 4 | P 1 | R 2 | P 2 | P 3 |

B 3 | R 1 | G 2 | R 3 | R 4 | G 5 |

W 3 | Y 6 | Y 5 | Y 2 | B 5 | G 1 |

Y 1 | B 4 | W 2 | G 6 | G 4 | G 3 |
```

   =======   Connected in original permutation but not all   =======

```
W 6 | W 1 | Y 1 | G 1 | Y 6 | W 5 |

Y 5 | W 3 | R 5 | W 2 | G 6 | R 1 |

G 3 | R 6 | P 3 | Y 3 | Y 2 | B 3 |

W 4 | R 3 | Y 4 | G 5 | G 4 | R 2 |

B 6 | P 2 | R 4 | P 1 | G 2 | B 1 |

P 4 | B 2 | B 4 | P 6 | B 5 | P 5 |
```

   =======   Connected in original permutation but not all   =======

```
Y 3 | P 5 | B 5 | R 1 | G 1 | G 2 |

P 4 | B 1 | W 4 | G 4 | B 2 | W 5 |

P 2 | B 6 | R 5 | Y 5 | B 4 | R 2 |

Y 4 | Y 1 | Y 6 | P 1 | R 4 | P 3 |

R 3 | W 2 | W 1 | B 3 | G 6 | W 6 |

G 3 | R 6 | Y 2 | G 5 | P 6 | W 3 |
```

   =======   Connected in original permutation but not all   =======

```
P 4 | P 2 | R 1 | Y 6 | W 6 | B 5 |

W 3 | Y 1 | P 1 | B 1 | P 6 | B 4 |

B 3 | W 4 | R 6 | R 5 | Y 4 | Y 3 |

W 2 | P 3 | G 2 | W 1 | G 1 | G 5 |

Y 5 | W 5 | G 4 | B 6 | Y 2 | G 3 |

R 2 | P 5 | G 6 | B 2 | R 3 | R 4 |
```

   =======   Connected in original permutation but not all   =======

```
B 5 | W 4 | W 1 | P 2 | Y 4 | W 3 |

P 4 | P 3 | B 3 | B 4 | B 6 | G 2 |
```

```
R 3 | P 6 | Y 5 | B 1 | G 6 | R 5 |

B 2 | Y 3 | P 1 | R 2 | G 4 | Y 2 |

W 5 | W 2 | G 5 | Y 6 | G 1 | Y 1 |

P 5 | R 4 | W 6 | R 1 | G 3 | R 6 |
```

   =======   Connected in original permutation but not all   =======

```
R 2 | R 6 | R 4 | Y 5 | Y 3 | P 5 |

W 6 | Y 6 | R 5 | B 4 | R 3 | R 1 |

B 3 | Y 1 | W 3 | G 5 | B 5 | P 4 |

B 6 | W 1 | W 4 | P 1 | B 1 | G 2 |

Y 2 | P 2 | P 3 | G 3 | G 4 | W 5 |

P 6 | G 1 | Y 4 | B 2 | G 6 | W 2 |
```

   =======   Connected in original permutation but not all   =======

```
W 1 | G 6 | R 2 | P 3 | G 1 | B 4 |

B 1 | R 3 | W 5 | P 2 | R 1 | W 3 |

W 2 | P 6 | Y 2 | R 6 | W 6 | R 4 |

G 5 | B 2 | Y 6 | P 1 | Y 4 | P 4 |

B 5 | P 5 | G 4 | Y 1 | B 3 | Y 5 |

W 4 | B 6 | G 2 | G 3 | R 5 | Y 3 |
```

   =======   Connected in original permutation but not all   =======

```
R 6 | B 6 | G 5 | P 5 | B 3 | G 4 |

G 2 | G 6 | B 1 | Y 1 | R 1 | B 4 |

G 3 | B 2 | G 1 | P 6 | P 3 | Y 6 |

Y 4 | Y 2 | B 5 | R 4 | W 2 | W 6 |

W 3 | Y 3 | R 2 | P 2 | W 1 | P 1 |

Y 5 | R 3 | R 5 | P 4 | W 4 | W 5 |
```

   =======   Connected in original permutation but not all   =======

```
G 5 | R 6 | G 2 | Y 3 | Y 2 | Y 5 |

Y 4 | Y 1 | R 3 | W 5 | W 2 | P 6 |
```

P 5 | Y 6 | G 1 | B 4 | R 1 | R 4 |

B 3 | W 1 | B 6 | G 6 | P 1 | P 2 |

R 5 | P 3 | R 2 | W 4 | W 3 | B 2 |

G 4 | W 6 | B 1 | P 4 | B 5 | G 3 |

   =======   Connected in original permutation but not all   =======

P 2 | Y 3 | P 3 | B 6 | P 4 | Y 6 |

G 2 | Y 2 | P 5 | B 3 | B 4 | R 2 |

G 1 | P 1 | Y 5 | G 6 | Y 1 | P 6 |

R 4 | Y 4 | W 4 | W 2 | R 1 | W 1 |

B 1 | W 6 | G 3 | R 6 | B 5 | R 5 |

G 5 | B 2 | G 4 | R 3 | W 5 | W 3 |

   =======   Connected in original permutation but not all   =======

G 3 | B 2 | R 2 | W 1 | B 1 | W 5 |

G 6 | P 6 | G 5 | Y 6 | G 4 | W 2 |

B 4 | G 1 | G 2 | B 5 | B 3 | B 6 |

W 3 | Y 5 | W 6 | W 4 | Y 1 | R 1 |

R 5 | Y 2 | Y 3 | P 1 | P 5 | P 2 |

P 4 | R 3 | Y 4 | P 3 | R 4 | R 6 |

   =======   Connected in original permutation but not all   =======

P 1 | P 6 | R 6 | G 6 | W 5 | Y 1 |

G 1 | B 2 | Y 5 | P 2 | R 5 | G 5 |

Y 3 | G 4 | Y 2 | P 4 | Y 4 | Y 6 |

W 4 | B 1 | G 3 | R 1 | W 1 | R 3 |

G 2 | B 3 | B 4 | W 2 | B 6 | B 5 |

W 3 | R 4 | R 2 | W 6 | P 3 | P 5 |

   =======   Connected in original permutation but not all   =======

G 4 | B 1 | R 4 | W 4 | P 6 | B 6 |

Y 5 | W 6 | Y 3 | P 5 | W 2 | B 5 |

P 4 | R 3 | W 5 | G 1 | P 1 | W 3 |

```
W 1 | G 3 | G 2 | Y 1 | G 6 | Y 2 |

P 3 | R 6 | B 3 | P 2 | R 5 | G 5 |

R 2 | R 1 | B 2 | Y 6 | Y 4 | B 4 |

   =======   Connected in original permutation but not all   =======

B 6 | R 5 | Y 6 | W 5 | W 2 | B 5 |

R 6 | G 5 | P 3 | R 2 | Y 3 | R 1 |

W 6 | R 4 | Y 1 | B 2 | W 4 | Y 5 |

B 3 | R 3 | Y 4 | B 4 | G 3 | P 5 |

W 1 | W 3 | Y 2 | P 1 | B 1 | P 4 |

G 2 | G 4 | G 6 | P 2 | P 6 | G 1 |

   =======   Connected in original permutation but not all   =======

W 3 | G 4 | P 5 | R 3 | W 2 | R 4 |

R 5 | R 6 | W 5 | Y 1 | P 2 | Y 5 |

W 4 | R 1 | W 1 | G 5 | R 2 | W 6 |

B 4 | Y 4 | Y 3 | P 4 | B 1 | G 2 |

Y 6 | B 2 | B 6 | P 3 | B 3 | P 6 |

Y 2 | B 5 | G 1 | G 6 | P 1 | G 3 |

   =======   Connected in original permutation but not all   =======

B 3 | Y 4 | W 5 | Y 1 | P 1 | R 5 |

P 5 | G 6 | R 2 | P 2 | R 1 | P 4 |

P 3 | W 2 | G 1 | Y 6 | R 4 | Y 2 |

R 6 | P 6 | W 6 | W 3 | R 3 | G 2 |

Y 3 | W 1 | Y 5 | B 2 | G 5 | B 5 |

W 4 | G 3 | G 4 | B 1 | B 6 | B 4 |

   =======   Connected in original permutation but not all   =======

P 5 | G 4 | W 1 | Y 1 | P 2 | G 1 |

G 5 | Y 2 | B 3 | P 3 | P 1 | Y 5 |

G 3 | W 6 | P 6 | B 2 | P 4 | R 5 |
```

```
Y 3 | W 3 | W 5 | R 1 | B 1 | B 5 |

W 2 | W 4 | Y 6 | R 2 | R 6 | B 6 |

G 2 | Y 4 | G 6 | B 4 | R 3 | R 4 |
```

=======   Connected in original permutation but not all   =======

```
B 2 | B 6 | Y 1 | P 6 | W 5 | G 2 |

Y 5 | W 1 | B 1 | W 2 | Y 4 | P 1 |

R 2 | B 3 | G 4 | G 1 | P 2 | W 4 |

W 3 | W 6 | R 3 | G 5 | Y 6 | Y 3 |

B 5 | R 1 | G 3 | B 4 | P 3 | R 5 |

Y 2 | R 6 | R 4 | G 6 | P 5 | P 4 |
```

=======   Connected in original permutation but not all   =======

```
Y 1 | R 6 | G 3 | G 6 | P 5 | Y 6 |

G 5 | Y 5 | G 4 | W 6 | G 1 | G 2 |

B 4 | W 5 | W 2 | P 2 | W 1 | B 1 |

R 1 | R 2 | R 5 | B 5 | Y 3 | B 6 |

Y 2 | W 3 | W 4 | P 1 | Y 4 | R 3 |

B 2 | R 4 | P 3 | P 6 | P 4 | B 3 |
```

=======   Connected in original permutation but not all   =======

```
R 4 | R 2 | B 1 | R 6 | W 1 | W 4 |

R 5 | Y 6 | G 2 | B 2 | W 2 | Y 5 |

P 3 | W 5 | R 3 | W 6 | B 3 | P 5 |

B 5 | R 1 | Y 1 | Y 3 | Y 4 | Y 2 |

G 1 | P 4 | P 6 | G 6 | P 2 | P 1 |

B 6 | B 4 | W 3 | G 4 | G 5 | G 3 |
```

=======   Connected in original permutation but not all   =======

```
G 3 | G 2 | P 2 | Y 1 | W 3 | B 1 |

Y 4 | W 5 | P 1 | G 5 | P 3 | G 4 |

Y 5 | P 4 | B 6 | Y 2 | G 1 | W 1 |

W 6 | P 5 | Y 6 | W 4 | P 6 | R 5 |
```

```
B 5 | R 6 | B 3 | R 2 | W 2 | R 1 |

Y 3 | B 2 | B 4 | G 6 | R 3 | R 4 |

   =======   Connected in original permutation but not all   =======

Y 5 | B 5 | P 6 | Y 6 | R 1 | R 2 |

G 3 | P 5 | P 1 | W 2 | P 4 | W 4 |

G 4 | P 2 | W 1 | Y 3 | G 1 | W 3 |

W 6 | P 3 | R 5 | W 5 | Y 1 | G 6 |

Y 2 | B 4 | B 2 | B 6 | B 3 | G 5 |

G 2 | B 1 | R 4 | Y 4 | R 6 | R 3 |

   =======   Connected in original permutation but not all   =======

Y 4 | G 2 | G 3 | P 5 | Y 1 | P 2 |

Y 3 | B 6 | W 5 | B 1 | P 1 | G 1 |

B 4 | W 3 | Y 6 | G 6 | G 4 | W 2 |

Y 5 | W 4 | G 5 | W 1 | P 4 | P 3 |

B 2 | W 6 | P 6 | R 6 | R 5 | R 1 |

B 5 | Y 2 | B 3 | R 2 | R 3 | R 4 |

   =======   Connected in original permutation but not all   =======

P 4 | W 4 | G 1 | W 2 | B 6 | G 5 |

P 2 | P 1 | Y 6 | B 1 | G 4 | W 5 |

G 6 | G 3 | G 2 | W 3 | P 3 | W 1 |

R 4 | R 6 | Y 5 | B 4 | Y 4 | Y 2 |

R 2 | Y 1 | W 6 | Y 3 | P 6 | R 3 |

P 5 | B 3 | B 2 | R 5 | R 1 | B 5 |

   =======   Connected in original permutation but not all   =======

B 4 | Y 2 | B 5 | G 2 | P 4 | P 1 |

R 4 | B 6 | R 3 | G 4 | R 1 | P 2 |

G 3 | R 5 | R 6 | P 5 | P 3 | Y 3 |

Y 1 | Y 5 | W 5 | G 5 | W 6 | G 1 |
```

```
R 2 | G 6 | B 1 | W 2 | B 3 | W 4 |

P 6 | Y 6 | W 3 | W 1 | Y 4 | B 2 |

   =======   Connected in original permutation but not all   =======

P 3 | R 1 | B 1 | P 5 | W 2 | P 2 |

R 6 | P 1 | P 6 | R 2 | R 3 | G 5 |

B 4 | R 4 | P 4 | Y 4 | Y 3 | B 6 |

Y 1 | Y 2 | B 2 | W 5 | Y 6 | Y 5 |

G 1 | R 5 | G 3 | G 6 | W 4 | W 1 |

G 4 | W 6 | W 3 | B 5 | G 2 | B 3 |

   =======   Connected in original permutation but not all   =======

B 4 | Y 2 | Y 6 | Y 4 | R 1 | W 3 |

R 4 | B 6 | B 3 | G 4 | Y 3 | R 5 |

Y 1 | B 1 | Y 5 | G 2 | B 2 | B 5 |

R 6 | G 3 | R 3 | W 2 | W 4 | W 6 |

G 5 | W 1 | R 2 | P 4 | G 1 | P 1 |

G 6 | P 6 | W 5 | P 5 | P 3 | P 2 |

   =======   Connected in original permutation but not all   =======

R 1 | W 4 | W 2 | R 3 | R 5 | R 2 |

W 1 | P 2 | R 6 | W 5 | W 6 | Y 1 |

G 1 | W 3 | G 3 | Y 3 | B 3 | G 2 |

G 4 | Y 6 | R 4 | Y 5 | B 4 | P 5 |

B 6 | P 6 | B 1 | P 1 | G 5 | G 6 |

B 2 | P 3 | P 4 | Y 2 | B 5 | Y 4 |

   =======   Connected in original permutation but not all   =======

W 1 | P 1 | G 1 | R 3 | P 3 | G 6 |

Y 5 | Y 2 | G 2 | B 6 | B 2 | P 5 |

G 4 | Y 3 | P 6 | Y 1 | P 2 | G 3 |

W 6 | W 5 | R 5 | R 6 | B 1 | P 4 |

B 3 | G 5 | W 2 | W 3 | W 4 | R 2 |
```

Y 4 | R 1 | Y 6 | B 4 | R 4 | B 5 |

  =======   Connected in original permutation but not all   =======

P 4 | G 2 | R 6 | B 5 | R 2 | R 4 |

B 1 | R 5 | Y 2 | Y 3 | G 5 | W 4 |

B 2 | R 3 | W 6 | W 5 | B 3 | Y 4 |

G 6 | B 4 | G 4 | P 6 | W 2 | W 1 |

R 1 | G 1 | P 3 | Y 5 | Y 6 | P 1 |

B 6 | G 3 | W 3 | P 2 | Y 1 | P 5 |

  =======   Connected in original permutation but not all   =======

B 3 | R 4 | B 5 | B 1 | W 6 | P 4 |

W 4 | R 5 | G 5 | Y 4 | Y 1 | Y 3 |

B 4 | B 2 | B 6 | G 1 | W 2 | P 2 |

R 6 | W 3 | R 3 | Y 2 | Y 6 | W 1 |

P 1 | P 3 | G 2 | R 1 | R 2 | G 6 |

G 4 | Y 5 | W 5 | P 5 | G 3 | P 6 |

  =======   Connected in original permutation but not all   =======

W 5 | P 5 | R 3 | G 3 | G 2 | W 4 |

B 1 | R 6 | Y 2 | W 3 | Y 5 | R 5 |

G 5 | W 6 | R 4 | Y 3 | G 1 | W 2 |

R 1 | G 6 | R 2 | B 2 | P 1 | B 5 |

Y 4 | W 1 | P 2 | G 4 | Y 6 | Y 1 |

P 4 | P 6 | P 3 | B 6 | B 4 | B 3 |

  =======   Connected in original permutation but not all   =======

B 4 | G 4 | R 5 | B 1 | R 6 | W 3 |

Y 5 | P 2 | G 1 | P 1 | B 2 | R 2 |

B 6 | R 1 | Y 2 | R 3 | G 6 | Y 6 |

B 3 | R 4 | W 2 | P 6 | G 3 | W 5 |

G 5 | B 5 | W 6 | G 2 | W 4 | W 1 |

```
Y 4 | Y 1 | Y 3 | P 5 | P 3 | P 4 |

  =======   Connected in original permutation but not all   =======

B 4 | P 6 | P 3 | R 6 | Y 6 | B 3 |

P 1 | R 3 | W 2 | W 1 | Y 2 | Y 5 |

Y 1 | Y 3 | Y 4 | R 1 | P 5 | B 2 |

R 2 | B 5 | P 2 | G 4 | G 3 | R 5 |

B 1 | R 4 | B 6 | G 1 | G 5 | W 4 |

G 6 | W 6 | P 4 | W 3 | G 2 | W 5 |

  =======   Connected in original permutation but not all   =======

G 2 | R 6 | B 5 | W 6 | R 1 | W 5 |

R 2 | G 1 | Y 4 | G 4 | G 6 | W 1 |

P 4 | R 4 | W 4 | W 2 | P 5 | G 5 |

R 3 | G 3 | W 3 | R 5 | P 1 | B 3 |

B 4 | Y 2 | Y 6 | P 2 | B 6 | B 1 |

Y 3 | Y 1 | Y 5 | P 6 | P 3 | B 2 |

  =======   Connected in original permutation but not all   =======

B 1 | B 2 | Y 3 | P 5 | G 4 | R 5 |

W 2 | W 3 | B 4 | W 1 | P 3 | W 5 |

P 2 | Y 6 | G 6 | P 6 | P 1 | Y 4 |

Y 1 | B 5 | B 6 | B 3 | R 4 | R 1 |

P 4 | W 6 | Y 5 | G 2 | G 5 | R 2 |

W 4 | G 1 | Y 2 | R 3 | R 6 | G 3 |

  =======   Connected in original permutation but not all   =======

R 3 | P 3 | G 5 | Y 1 | G 3 | W 6 |

P 5 | B 4 | B 2 | Y 4 | P 4 | R 5 |

G 2 | R 6 | R 1 | Y 5 | R 2 | Y 3 |

P 2 | G 4 | G 1 | P 6 | B 5 | B 3 |

W 1 | W 2 | R 4 | B 1 | P 1 | Y 2 |

G 6 | W 3 | W 4 | B 6 | W 5 | Y 6 |
```

======= Connected in original permutation but not all =======

W 2 | W 3 | R 2 | P 6 | W 6 | P 2 |

W 1 | B 1 | W 5 | B 3 | R 6 | G 2 |

Y 3 | W 4 | G 6 | G 1 | B 5 | R 4 |

Y 6 | R 3 | G 3 | Y 4 | B 4 | G 4 |

R 1 | Y 5 | R 5 | P 1 | P 5 | P 3 |

Y 1 | G 5 | Y 2 | B 6 | P 4 | B 2 |

======= Connected in original permutation but not all =======

G 2 | G 1 | G 5 | P 1 | R 4 | P 4 |

R 5 | W 6 | R 1 | W 1 | Y 3 | W 2 |

R 2 | G 4 | G 6 | W 5 | Y 4 | G 3 |

P 2 | P 6 | R 3 | Y 6 | W 3 | B 1 |

Y 2 | P 3 | P 5 | W 4 | B 4 | B 6 |

Y 1 | Y 5 | R 6 | B 5 | B 2 | B 3 |

======= Connected in original permutation but not all =======

Y 5 | R 3 | G 2 | G 1 | G 5 | Y 2 |

B 4 | Y 3 | Y 6 | B 3 | W 2 | W 4 |

B 6 | R 1 | R 4 | B 1 | W 5 | B 5 |

R 5 | G 4 | G 6 | P 6 | Y 4 | Y 1 |

R 6 | B 2 | R 2 | W 6 | P 2 | W 1 |

G 3 | W 3 | P 1 | P 4 | P 5 | P 3 |

======= Connected in original permutation but not all =======

W 5 | G 2 | R 5 | R 2 | P 6 | W 4 |

P 2 | R 6 | B 6 | R 1 | W 1 | W 3 |

W 2 | G 3 | P 5 | R 3 | W 6 | G 4 |

B 1 | G 5 | Y 3 | P 3 | Y 4 | P 4 |

Y 6 | Y 5 | R 4 | P 1 | Y 1 | Y 2 |

G 1 | B 2 | G 6 | B 4 | B 3 | B 5 |

```
      =======    Connected in original permutation but not all    =======

B 2 | W 3 | W 1 | Y 3 | P 1 | G 4 |

R 4 | R 3 | P 6 | R 6 | P 2 | W 6 |

P 5 | P 3 | W 4 | G 1 | B 6 | G 5 |

B 4 | P 4 | Y 2 | G 6 | Y 5 | G 2 |

Y 4 | W 2 | B 5 | R 2 | B 1 | Y 6 |

B 3 | R 1 | G 3 | R 5 | Y 1 | W 5 |

      =======    Connected in original permutation but not all    =======

P 1 | G 1 | G 4 | W 1 | B 2 | R 2 |

P 6 | B 6 | B 1 | Y 1 | G 2 | G 6 |

R 5 | Y 4 | P 3 | R 3 | W 2 | G 5 |

Y 5 | P 4 | P 5 | G 3 | Y 3 | W 3 |

R 1 | Y 2 | P 2 | B 4 | B 5 | R 4 |

W 5 | B 3 | Y 6 | R 6 | W 6 | W 4 |

      =======    Connected in original permutation but not all    =======

Y 5 | Y 6 | B 5 | P 5 | Y 2 | Y 3 |

G 1 | P 3 | Y 4 | W 3 | P 4 | G 3 |

Y 1 | W 6 | G 5 | R 1 | G 4 | W 2 |

P 1 | P 2 | G 2 | B 3 | W 1 | R 2 |

B 4 | B 2 | G 6 | W 5 | W 4 | P 6 |

B 6 | B 1 | R 5 | R 4 | R 6 | R 3 |

      =======    Connected in original permutation but not all    =======

G 4 | G 1 | G 5 | P 4 | G 2 | P 5 |

B 2 | B 4 | G 6 | W 2 | B 3 | Y 1 |

G 3 | R 2 | P 3 | P 1 | Y 2 | W 1 |

Y 6 | R 6 | P 6 | B 1 | W 5 | R 3 |

W 4 | Y 5 | Y 3 | B 6 | R 4 | R 1 |

B 5 | P 2 | Y 4 | W 3 | W 6 | R 5 |

      =======    Connected in original permutation but not all    =======
```

```
B 2 | P 6 | B 6 | B 5 | G 6 | B 1 |

G 1 | W 3 | P 4 | B 4 | P 2 | G 5 |

R 4 | G 2 | R 6 | R 1 | G 3 | R 2 |

B 3 | R 3 | G 4 | P 1 | Y 1 | W 4 |

R 5 | Y 2 | W 1 | W 6 | W 5 | Y 4 |

Y 6 | Y 3 | Y 5 | P 3 | W 2 | P 5 |
```

   =======   Connected in original permutation but not all   =======

```
Y 2 | R 5 | P 1 | W 2 | G 1 | R 4 |

W 5 | Y 1 | W 6 | G 3 | R 1 | W 1 |

B 1 | W 4 | Y 3 | R 3 | W 3 | B 5 |

Y 6 | R 2 | B 3 | R 6 | B 2 | P 6 |

B 6 | Y 4 | B 4 | G 2 | G 4 | P 2 |

P 3 | P 5 | Y 5 | P 4 | G 6 | G 5 |
```

   =======   Connected in original permutation but not all   =======

```
P 5 | Y 2 | W 5 | B 2 | B 1 | R 2 |

P 6 | W 4 | W 6 | R 5 | Y 4 | W 3 |

P 1 | Y 6 | P 4 | P 2 | B 4 | G 2 |

B 3 | G 3 | G 6 | G 1 | W 1 | P 3 |

Y 3 | W 2 | Y 1 | G 5 | R 3 | G 4 |

R 6 | B 6 | B 5 | Y 5 | R 1 | R 4 |
```

   =======   Connected in original permutation but not all   =======

```
P 1 | R 5 | R 6 | W 2 | R 1 | Y 2 |

G 6 | W 5 | R 2 | R 3 | P 6 | W 3 |

Y 3 | R 4 | P 3 | G 4 | P 4 | G 3 |

Y 4 | Y 6 | W 4 | G 1 | B 6 | G 2 |

P 5 | B 4 | G 5 | W 1 | B 5 | Y 1 |

W 6 | Y 5 | B 3 | P 2 | B 1 | B 2 |
```

   =======   Connected in original permutation but not all   =======

```
B 5 | G 3 | P 3 | W 5 | B 2 | G 1 |

B 4 | G 4 | R 1 | Y 2 | W 4 | B 6 |

R 6 | P 5 | R 2 | B 1 | P 2 | R 5 |

P 4 | Y 5 | P 6 | Y 1 | Y 4 | Y 6 |

Y 3 | G 6 | R 3 | P 1 | W 1 | G 5 |

B 3 | W 2 | R 4 | G 2 | W 3 | W 6 |
```

======= Connected in original permutation but not all   =======

```
P 5 | R 2 | Y 3 | Y 2 | Y 4 | B 6 |

W 6 | P 3 | W 3 | G 6 | P 4 | W 1 |

Y 5 | R 6 | R 5 | R 4 | R 3 | P 2 |

P 6 | G 1 | B 3 | Y 6 | G 4 | B 4 |

G 2 | R 1 | G 3 | B 1 | Y 1 | G 5 |

P 1 | B 5 | W 4 | W 2 | W 5 | B 2 |
```

======= Connected in original permutation but not all   =======

```
G 1 | W 2 | P 5 | R 5 | W 4 | Y 1 |

G 3 | G 2 | Y 2 | P 1 | W 6 | G 5 |

R 1 | Y 4 | W 1 | P 2 | Y 5 | P 4 |

B 2 | G 4 | Y 3 | R 2 | B 4 | B 3 |

W 3 | W 5 | Y 6 | B 5 | B 6 | P 3 |

R 6 | R 3 | B 1 | P 6 | G 6 | R 4 |
```

======= Connected in original permutation but not all   =======

```
G 1 | G 6 | P 3 | B 4 | B 2 | R 2 |

Y 3 | P 2 | R 5 | Y 6 | R 4 | G 4 |

R 1 | W 2 | B 5 | B 3 | B 6 | P 6 |

R 3 | P 4 | P 5 | W 3 | W 6 | B 1 |

P 1 | R 6 | G 3 | W 5 | Y 5 | W 1 |

G 2 | W 4 | G 5 | Y 2 | Y 1 | Y 4 |
```

======= Connected in original permutation but not all   =======

```
B 5 | W 4 | P 4 | B 6 | B 1 | B 3 |
```

```
W 6 | G 2 | G 1 | W 1 | Y 4 | P 6 |

B 2 | B 4 | R 5 | Y 6 | Y 1 | W 2 |

R 1 | Y 5 | R 2 | Y 3 | R 4 | W 3 |

P 1 | G 3 | G 4 | R 3 | P 5 | P 3 |

G 6 | G 5 | W 5 | P 2 | R 6 | Y 2 |

  ======= Connected in original permutation but not all  =======

Y 2 | R 1 | B 2 | W 5 | P 4 | G 4 |

R 2 | R 4 | Y 5 | P 2 | P 5 | B 5 |

Y 4 | W 1 | Y 1 | P 6 | W 2 | B 4 |

W 3 | R 3 | P 1 | R 5 | G 5 | Y 6 |

B 1 | P 3 | W 6 | Y 3 | B 3 | G 6 |

W 4 | G 1 | R 6 | G 3 | G 2 | B 6 |

  ======= Connected in original permutation but not all  =======

P 6 | B 3 | B 6 | G 3 | G 4 | G 5 |

Y 2 | W 6 | W 2 | Y 3 | R 4 | W 3 |

G 2 | Y 6 | G 1 | W 5 | R 6 | G 6 |

P 1 | R 1 | R 5 | B 5 | W 1 | R 3 |

B 2 | W 4 | Y 5 | P 4 | P 3 | B 1 |

P 2 | R 2 | Y 4 | B 4 | Y 1 | P 5 |

  ======= Connected in original permutation but not all  =======

Y 1 | Y 3 | B 1 | G 3 | R 1 | R 6 |

G 6 | R 2 | B 4 | B 3 | R 3 | W 3 |

B 2 | G 2 | R 5 | W 5 | B 6 | P 6 |

G 5 | G 4 | G 1 | P 3 | Y 4 | P 5 |

B 5 | P 1 | Y 6 | P 2 | W 6 | W 2 |

Y 2 | R 4 | Y 5 | W 4 | W 1 | P 4 |

  ======= Connected in original permutation but not all  =======

P 5 | B 5 | B 1 | R 5 | Y 5 | B 3 |
```

```
R 3 | G 6 | W 1 | R 4 | R 2 | B 6 |

W 6 | R 6 | P 3 | Y 2 | P 1 | Y 1 |

B 2 | B 4 | R 1 | G 5 | P 4 | W 5 |

Y 6 | W 2 | Y 3 | G 3 | W 3 | P 2 |

Y 4 | W 4 | P 6 | G 4 | G 2 | G 1 |

   =======   Connected in original permutation but not all   =======

B 3 | Y 1 | B 5 | B 6 | Y 2 | Y 5 |

P 3 | Y 4 | Y 3 | W 6 | B 2 | R 3 |

B 1 | B 4 | W 4 | P 4 | R 6 | P 2 |

P 5 | P 6 | G 3 | W 2 | R 4 | W 5 |

R 5 | Y 6 | R 1 | G 1 | W 3 | W 1 |

P 1 | R 2 | G 2 | G 6 | G 4 | G 5 |

   =======   Connected in original permutation but not all   =======

P 6 | Y 4 | B 5 | B 3 | W 1 | G 4 |

G 3 | Y 3 | B 6 | R 3 | B 4 | P 3 |

P 5 | G 1 | B 1 | B 2 | G 2 | R 2 |

P 2 | R 4 | Y 5 | P 1 | W 5 | Y 6 |

Y 1 | W 4 | R 1 | G 5 | R 5 | W 2 |

G 6 | P 4 | Y 2 | W 6 | R 6 | W 3 |

   =======   Connected in original permutation but not all   =======

W 1 | B 3 | G 1 | W 5 | W 6 | R 3 |

Y 5 | R 2 | B 1 | W 4 | Y 1 | R 1 |

G 4 | B 2 | Y 6 | P 6 | R 4 | R 5 |

G 6 | G 5 | R 6 | W 2 | P 4 | B 5 |

Y 4 | B 6 | G 2 | G 3 | Y 3 | P 2 |

W 3 | B 4 | Y 2 | P 3 | P 1 | P 5 |

   =======   Connected in original permutation but not all   =======

B 5 | P 4 | G 3 | W 5 | W 4 | B 3 |

R 2 | B 6 | W 1 | G 1 | P 5 | Y 2 |
```

```
Y 5 | G 6 | Y 3 | Y 6 | B 2 | P 2 |

R 4 | B 1 | R 5 | G 4 | P 1 | P 3 |

W 3 | B 4 | R 1 | R 6 | G 2 | W 6 |

W 2 | G 5 | R 3 | Y 1 | Y 4 | P 6 |

   =======   Connected in original permutation but not all   =======

G 1 | R 6 | Y 3 | P 5 | W 1 | Y 1 |

Y 6 | Y 2 | Y 5 | P 2 | P 3 | Y 4 |

P 1 | B 3 | G 2 | G 4 | R 2 | P 4 |

B 2 | R 1 | R 5 | W 6 | R 3 | W 5 |

P 6 | B 5 | B 1 | B 6 | W 4 | G 5 |

B 4 | R 4 | G 3 | G 6 | W 2 | W 3 |

   =======   Connected in original permutation but not all   =======

W 4 | G 3 | P 2 | B 1 | P 1 | P 6 |

P 4 | Y 6 | G 6 | G 1 | W 2 | G 2 |

B 5 | Y 2 | W 3 | G 4 | W 1 | Y 4 |

B 3 | R 3 | R 1 | R 4 | P 3 | Y 3 |

W 6 | G 5 | R 6 | B 4 | P 5 | R 2 |

Y 1 | R 5 | Y 5 | W 5 | B 6 | B 2 |

   =======   Connected in original permutation but not all   =======

B 3 | R 5 | B 4 | W 2 | Y 4 | G 6 |

Y 6 | Y 2 | R 3 | Y 1 | G 3 | B 2 |

Y 5 | R 1 | P 5 | G 5 | Y 3 | B 5 |

W 4 | P 4 | R 2 | W 1 | G 4 | R 6 |

W 6 | W 5 | G 2 | B 1 | B 6 | G 1 |

P 3 | W 3 | R 4 | P 6 | P 2 | P 1 |

   =======   Connected in original permutation but not all   =======

G 2 | B 4 | B 1 | W 1 | G 5 | P 5 |

Y 5 | P 6 | Y 1 | B 3 | W 6 | G 1 |
```

```
B 6 | R 6 | R 1 | B 5 | R 5 | B 2 |

G 6 | Y 6 | Y 2 | G 4 | W 3 | P 2 |

W 5 | Y 4 | G 3 | R 4 | P 3 | P 1 |

Y 3 | P 4 | W 4 | R 2 | R 3 | W 2 |
```

  =======   Connected in original permutation but not all   =======

```
R 5 | P 1 | Y 1 | G 3 | Y 6 | W 1 |

G 4 | R 4 | G 2 | B 5 | B 3 | G 6 |

P 3 | R 1 | R 2 | G 1 | B 1 | Y 2 |

B 2 | B 4 | B 6 | P 5 | P 6 | Y 3 |

P 2 | W 3 | R 6 | Y 4 | Y 5 | P 4 |

R 3 | W 6 | G 5 | W 2 | W 4 | W 5 |
```

  =======   Connected in original permutation but not all   =======

```
B 2 | B 1 | Y 2 | W 6 | Y 1 | G 1 |

R 3 | R 5 | Y 6 | G 3 | B 6 | Y 3 |

P 1 | P 6 | W 3 | W 1 | G 2 | Y 5 |

W 5 | W 2 | R 2 | B 5 | B 3 | W 4 |

R 1 | G 4 | R 6 | G 5 | P 5 | P 2 |

Y 4 | P 3 | R 4 | P 4 | G 6 | B 4 |
```

  =======   Connected in original permutation but not all   =======

```
B 3 | G 6 | W 2 | W 1 | Y 2 | R 3 |

Y 5 | G 1 | R 5 | B 4 | Y 3 | W 5 |

B 2 | P 6 | R 2 | R 4 | G 4 | R 6 |

R 1 | G 2 | G 5 | G 3 | Y 6 | B 5 |

B 1 | Y 1 | P 1 | B 6 | P 3 | P 4 |

W 4 | W 6 | P 5 | Y 4 | P 2 | W 3 |
```

  =======   Connected in original permutation but not all   =======

```
W 5 | W 1 | W 3 | B 5 | G 6 | Y 4 |

G 5 | R 3 | Y 5 | W 6 | R 1 | R 6 |

R 2 | P 6 | B 4 | P 5 | P 2 | B 6 |
```

B 3 | G 1 | Y 6 | B 1 | P 1 | P 3 |

W 2 | Y 1 | P 4 | Y 2 | R 5 | R 4 |

Y 3 | W 4 | G 2 | B 2 | G 3 | G 4 |

======= Connected in original permutation but not all ======

W 5 | W 1 | Y 5 | B 3 | B 6 | R 4 |

B 5 | G 5 | B 1 | B 4 | B 2 | Y 1 |

R 3 | P 6 | P 2 | P 3 | R 6 | R 5 |

G 1 | Y 3 | P 1 | Y 4 | Y 2 | R 1 |

W 6 | Y 6 | G 6 | P 4 | W 3 | R 2 |

P 5 | W 4 | G 2 | G 3 | W 2 | G 4 |

======= Connected in original permutation but not all ======

P 4 | B 3 | W 4 | P 2 | P 5 | Y 3 |

P 6 | B 6 | G 1 | B 2 | P 3 | P 1 |

G 3 | G 6 | B 1 | R 1 | R 2 | G 2 |

R 5 | Y 4 | W 5 | B 4 | B 5 | Y 2 |

Y 6 | W 6 | G 4 | R 4 | R 3 | Y 5 |

G 5 | W 2 | W 1 | R 6 | W 3 | Y 1 |

======= Connected in original permutation but not all ======

G 5 | B 1 | Y 6 | B 2 | P 6 | P 5 |

R 6 | P 4 | W 1 | W 5 | G 1 | W 2 |

P 1 | Y 4 | B 6 | W 4 | G 3 | Y 5 |

W 6 | G 2 | B 4 | W 3 | R 5 | G 4 |

Y 2 | P 2 | R 4 | R 2 | B 5 | B 3 |

Y 1 | Y 3 | G 6 | R 3 | R 1 | P 3 |

======= Connected in original permutation but not all ======

B 3 | B 5 | P 2 | R 2 | W 3 | R 5 |

G 3 | W 2 | W 5 | W 6 | P 5 | R 3 |

B 2 | G 2 | Y 5 | Y 3 | Y 6 | B 4 |

```
Y 1 | R 1 | P 3 | P 1 | G 1 | Y 4 |

B 6 | W 4 | R 6 | Y 2 | G 6 | B 1 |

R 4 | W 1 | G 5 | G 4 | P 6 | P 4 |
```

=======   Connected in original permutation but not all   =======

```
P 5 | Y 2 | W 3 | G 3 | B 6 | G 2 |

B 3 | B 1 | W 6 | R 3 | P 4 | W 2 |

P 2 | G 5 | W 1 | G 6 | W 4 | Y 3 |

P 3 | W 5 | R 1 | B 2 | Y 5 | Y 6 |

G 1 | G 4 | P 6 | B 4 | R 4 | B 5 |

Y 1 | P 1 | Y 4 | R 5 | R 6 | R 2 |
```

=======   Connected in original permutation but not all   =======

```
P 2 | P 3 | G 1 | B 1 | B 3 | Y 1 |

G 5 | G 6 | P 5 | P 4 | P 6 | B 2 |

P 1 | W 1 | G 4 | G 3 | Y 4 | W 5 |

Y 2 | G 2 | R 2 | B 6 | R 1 | B 5 |

Y 3 | R 3 | R 5 | R 6 | W 3 | B 4 |

R 4 | Y 6 | Y 5 | W 6 | W 4 | W 2 |
```

=======   Connected in original permutation but not all   =======

```
B 3 | Y 2 | W 5 | B 5 | P 3 | Y 4 |

B 2 | Y 6 | Y 3 | B 4 | W 1 | P 1 |

R 2 | B 1 | R 4 | B 6 | W 4 | R 3 |

G 1 | G 3 | P 5 | W 3 | W 6 | Y 1 |

G 5 | P 6 | W 2 | P 2 | R 1 | R 5 |

Y 5 | G 4 | P 4 | G 6 | G 2 | R 6 |
```

=======   Connected in original permutation but not all   =======

```
G 4 | R 6 | Y 4 | Y 3 | Y 5 | Y 6 |

G 1 | R 2 | B 4 | G 6 | W 6 | R 1 |

R 5 | G 5 | P 3 | R 4 | R 3 | Y 1 |

P 4 | G 2 | W 5 | W 4 | W 1 | W 3 |
```

G 3 | Y 2 | P 6 | B 3 | B 2 | P 5 |

P 2 | B 6 | W 2 | P 1 | B 5 | B 1 |

   =======   Connected in original permutation but not all   =======

R 5 | G 4 | R 4 | Y 4 | W 3 | R 3 |

R 1 | R 2 | P 2 | Y 5 | B 4 | Y 6 |

R 6 | P 3 | W 1 | Y 1 | G 3 | P 5 |

P 1 | P 6 | G 6 | W 2 | G 2 | W 4 |

W 5 | G 5 | Y 2 | W 6 | B 1 | B 2 |

G 1 | Y 3 | P 4 | B 3 | B 6 | B 5 |

   =======   Connected in original permutation but not all   =======

W 4 | P 2 | R 2 | R 4 | R 5 | G 2 |

W 5 | P 4 | B 5 | Y 5 | W 6 | B 3 |

Y 1 | G 1 | B 2 | Y 3 | R 1 | R 3 |

P 5 | G 3 | R 6 | Y 6 | Y 4 | Y 2 |

B 1 | G 4 | W 1 | P 1 | W 2 | W 3 |

P 3 | G 6 | G 5 | B 6 | P 6 | B 4 |

   =======   Connected in original permutation but not all   =======

P 2 | Y 2 | G 5 | P 4 | P 1 | Y 3 |

G 2 | P 6 | W 4 | G 1 | B 3 | P 3 |

P 5 | G 6 | G 4 | W 3 | R 3 | R 4 |

G 3 | Y 1 | R 6 | B 1 | B 5 | Y 4 |

Y 6 | B 2 | R 5 | B 4 | Y 5 | W 1 |

B 6 | R 1 | R 2 | W 5 | W 2 | W 6 |

   =======   Connected in original permutation but not all   =======

G 2 | G 1 | W 2 | B 1 | P 4 | G 5 |

R 3 | P 1 | G 4 | P 2 | P 5 | R 1 |

W 6 | Y 3 | R 4 | B 2 | B 6 | W 4 |

G 3 | G 6 | Y 5 | Y 1 | Y 2 | W 3 |

```
Y 4 | W 1 | R 6 | B 4 | B 5 | B 3 |

R 2 | Y 6 | W 5 | P 6 | R 5 | P 3 |

   =======   Connected in original permutation but not all   =======

Y 5 | R 5 | W 3 | P 4 | P 1 | B 5 |

B 1 | B 2 | Y 4 | G 5 | P 6 | G 6 |

G 4 | R 6 | R 1 | R 2 | R 4 | R 3 |

B 6 | G 1 | P 3 | P 5 | W 4 | Y 6 |

P 2 | B 4 | G 3 | G 2 | Y 2 | B 3 |

Y 1 | W 1 | Y 3 | W 2 | W 6 | W 5 |

   =======   Connected in original permutation but not all   =======

G 6 | W 4 | B 1 | G 4 | P 3 | G 1 |

W 5 | B 2 | R 6 | B 3 | Y 2 | Y 5 |

P 2 | W 6 | Y 6 | P 6 | Y 4 | P 5 |

Y 1 | G 5 | R 1 | R 2 | B 5 | B 6 |

P 4 | G 3 | G 2 | B 4 | W 3 | R 4 |

P 1 | R 5 | W 2 | R 3 | W 1 | Y 3 |

   =======   Connected in original permutation but not all   =======

W 6 | B 1 | W 5 | R 1 | B 6 | R 5 |

W 3 | R 3 | B 4 | W 4 | R 2 | G 3 |

W 1 | B 5 | W 2 | R 4 | G 5 | P 4 |

G 4 | R 6 | B 2 | P 1 | P 5 | Y 2 |

G 2 | B 3 | G 6 | Y 3 | P 3 | Y 6 |

G 1 | Y 5 | P 2 | P 6 | Y 4 | Y 1 |

   =======   Connected in original permutation but not all   =======

W 1 | G 4 | W 3 | B 4 | B 1 | Y 6 |

G 3 | W 2 | W 6 | B 5 | B 2 | R 3 |

P 4 | W 4 | Y 4 | W 5 | Y 3 | Y 2 |

G 6 | G 1 | G 2 | P 3 | Y 5 | P 2 |

R 5 | Y 1 | G 5 | R 1 | R 6 | R 2 |
```

B 3 | P 5 | P 6 | R 4 | P 1 | B 6 |

   =======   Connected in original permutation but not all   =======

R 1 | B 6 | B 5 | B 3 | P 6 | G 4 |

G 6 | W 6 | Y 3 | G 2 | P 2 | G 5 |

R 6 | B 1 | P 4 | Y 4 | B 2 | B 4 |

Y 1 | G 1 | R 4 | Y 5 | W 5 | W 3 |

P 1 | P 3 | G 3 | W 1 | W 2 | R 5 |

Y 6 | Y 2 | P 5 | R 2 | W 4 | R 3 |

   =======   Connected in original permutation but not all   =======

W 6 | P 5 | B 3 | Y 4 | G 6 | G 5 |

G 2 | P 1 | P 2 | R 3 | Y 3 | Y 1 |

W 5 | G 1 | Y 2 | P 4 | W 1 | B 2 |

P 3 | Y 6 | R 1 | P 6 | B 4 | R 6 |

Y 5 | R 4 | R 5 | B 5 | W 3 | G 3 |

R 2 | B 6 | B 1 | G 4 | W 4 | W 2 |

   =======   Connected in original permutation but not all   =======

W 6 | P 3 | Y 1 | Y 5 | B 6 | R 4 |

R 2 | Y 2 | G 5 | Y 6 | W 5 | R 5 |

W 1 | G 2 | G 4 | G 1 | W 3 | W 2 |

W 4 | B 5 | B 4 | R 6 | G 6 | G 3 |

Y 4 | Y 3 | R 1 | P 5 | R 3 | P 4 |

P 2 | P 6 | P 1 | B 1 | B 3 | B 2 |

   =======   Connected in original permutation but not all   =======

G 4 | W 5 | B 1 | G 2 | P 6 | R 2 |

G 1 | W 6 | B 2 | P 1 | R 4 | W 1 |

W 2 | B 3 | B 6 | P 5 | R 6 | W 3 |

B 4 | G 5 | P 3 | G 3 | R 1 | P 4 |

Y 4 | B 5 | G 6 | Y 2 | Y 6 | P 2 |

R 5 | W 4 | R 3 | Y 5 | Y 1 | Y 3 |

======= Connected in original permutation but not all ======

Y 4 | G 6 | Y 1 | Y 2 | Y 3 | G 1 |

Y 6 | R 6 | P 2 | P 6 | P 3 | P 5 |

G 5 | R 3 | R 5 | Y 5 | R 2 | P 1 |

P 4 | R 1 | B 5 | B 3 | G 4 | B 4 |

R 4 | G 2 | G 3 | W 1 | W 5 | W 4 |

B 2 | W 6 | W 2 | W 3 | B 6 | B 1 |

======= Connected in original permutation but not all ======

P 6 | Y 5 | R 5 | W 5 | P 1 | B 1 |

G 4 | W 3 | G 2 | B 4 | W 2 | Y 2 |

B 5 | W 1 | W 6 | P 2 | G 6 | R 2 |

G 3 | W 4 | R 4 | Y 1 | B 6 | R 1 |

B 2 | Y 4 | G 1 | P 4 | P 5 | Y 6 |

B 3 | R 3 | G 5 | P 3 | Y 3 | R 6 |

======= Connected in original permutation but not all ======

R 2 | P 4 | G 4 | B 5 | P 6 | B 6 |

G 1 | R 4 | W 4 | W 2 | G 3 | B 3 |

R 1 | P 3 | B 2 | Y 2 | Y 5 | W 5 |

B 1 | P 5 | G 2 | P 2 | G 6 | G 5 |

R 6 | B 4 | Y 3 | W 6 | W 3 | Y 1 |

P 1 | Y 4 | W 1 | Y 6 | R 5 | R 3 |

======= Connected in original permutation but not all ======

R 5 | Y 4 | P 4 | R 1 | P 5 | B 2 |

Y 3 | R 2 | R 6 | G 5 | R 3 | G 3 |

Y 6 | B 6 | Y 5 | Y 1 | B 3 | Y 2 |

G 1 | R 4 | B 5 | W 6 | P 2 | W 1 |

B 1 | G 4 | P 1 | P 6 | P 3 | W 3 |

W 4 | W 5 | B 4 | G 6 | G 2 | W 2 |

```
       =======    Connected in original permutation but not all    =======

W 5 | B 2 | Y 5 | R 3 | Y 4 | P 5 |

P 4 | R 1 | P 6 | G 3 | B 1 | Y 3 |

P 2 | W 3 | Y 6 | R 4 | W 6 | B 5 |

R 6 | R 5 | Y 2 | B 6 | B 3 | G 4 |

P 1 | R 2 | P 3 | G 1 | G 2 | G 6 |

B 4 | W 1 | W 2 | G 5 | Y 1 | W 4 |

       =======    Connected in original permutation but not all    =======

W 1 | P 2 | W 6 | B 6 | G 5 | R 3 |

Y 1 | P 1 | W 2 | B 1 | W 3 | B 4 |

B 3 | R 6 | P 3 | Y 4 | Y 6 | B 5 |

P 4 | R 1 | G 1 | G 2 | R 2 | R 4 |

W 4 | B 2 | W 5 | G 4 | R 5 | P 6 |

Y 5 | Y 2 | Y 3 | G 3 | G 6 | P 5 |

       =======    Connected in original permutation but not all    =======

B 6 | G 5 | P 3 | G 1 | G 3 | R 2 |

W 6 | Y 1 | Y 2 | Y 3 | B 5 | R 1 |

P 4 | W 2 | G 6 | B 2 | B 4 | B 1 |

R 5 | P 5 | Y 5 | G 2 | W 3 | R 4 |

B 3 | W 5 | G 4 | P 2 | P 6 | Y 6 |

R 3 | Y 4 | R 6 | W 1 | W 4 | P 1 |

       =======    Connected in original permutation but not all    =======

R 6 | Y 4 | R 4 | G 5 | G 4 | P 6 |

P 3 | G 6 | G 3 | R 3 | B 1 | R 1 |

R 5 | W 4 | G 2 | P 4 | G 1 | R 2 |

Y 3 | B 4 | W 3 | P 5 | P 2 | W 2 |

W 5 | W 1 | W 6 | B 2 | B 5 | B 3 |

Y 1 | Y 2 | P 1 | Y 6 | Y 5 | B 6 |
```

======= Connected in original permutation but not all ======

B 2 | R 5 | G 4 | Y 1 | W 1 | G 2 |

G 6 | G 5 | P 5 | B 3 | B 5 | R 3 |

B 4 | B 1 | W 4 | R 4 | W 6 | W 5 |

B 6 | P 3 | R 6 | W 3 | G 3 | P 2 |

P 1 | R 1 | W 2 | P 4 | Y 4 | Y 5 |

G 1 | Y 3 | R 2 | P 6 | Y 6 | Y 2 |

======= Connected in original permutation but not all ======

G 3 | G 2 | W 1 | P 4 | P 3 | G 4 |

R 1 | P 1 | R 6 | B 2 | W 3 | R 3 |

G 5 | P 5 | W 5 | P 2 | R 5 | Y 2 |

R 4 | W 4 | P 6 | G 6 | Y 3 | Y 4 |

W 6 | R 2 | B 6 | Y 1 | G 1 | B 4 |

Y 6 | W 2 | Y 5 | B 3 | B 1 | B 5 |

======= Connected in original permutation but not all ======

R 1 | Y 2 | W 2 | B 6 | P 2 | R 4 |

G 5 | B 2 | Y 4 | Y 3 | B 1 | W 5 |

P 4 | W 3 | B 5 | P 3 | B 4 | G 4 |

P 6 | R 2 | B 3 | Y 1 | G 2 | W 4 |

Y 6 | W 6 | P 1 | R 3 | G 1 | Y 5 |

W 1 | P 5 | R 6 | G 6 | G 3 | R 5 |

======= Connected in original permutation but not all ======

G 3 | R 2 | R 3 | W 5 | R 4 | P 3 |

G 1 | P 1 | Y 2 | W 6 | W 1 | W 4 |

W 2 | P 6 | R 5 | G 4 | R 6 | R 1 |

P 2 | Y 5 | W 3 | B 3 | B 5 | B 2 |

G 6 | P 5 | G 2 | B 4 | P 4 | Y 4 |

Y 1 | Y 6 | G 5 | B 1 | B 6 | Y 3 |

======= Connected in original permutation but not all ======

```
B 1 | R 6 | Y 5 | G 4 | Y 2 | B 6 |

Y 6 | G 3 | G 2 | Y 4 | W 4 | P 5 |

Y 1 | P 4 | R 1 | G 6 | Y 3 | W 5 |

B 5 | B 4 | B 2 | R 4 | W 6 | P 3 |

B 3 | G 5 | P 2 | R 5 | P 1 | R 2 |

W 1 | G 1 | R 3 | P 6 | W 3 | W 2 |
```
   =======   Connected in original permutation but not all   =======
```
R 1 | B 1 | G 1 | R 5 | B 3 | W 1 |

Y 4 | P 4 | P 3 | W 5 | P 1 | R 3 |

W 2 | P 5 | P 6 | B 5 | P 2 | W 4 |

Y 2 | G 4 | R 4 | B 6 | B 4 | W 3 |

R 6 | Y 1 | R 2 | Y 3 | G 3 | G 6 |

W 6 | G 2 | B 2 | Y 6 | G 5 | Y 5 |
```
   =======   Connected in original permutation but not all   =======
```
P 6 | B 5 | R 5 | R 4 | R 2 | P 3 |

B 3 | B 1 | W 5 | Y 2 | B 2 | P 5 |

P 2 | W 6 | W 1 | R 3 | G 4 | R 1 |

B 4 | G 1 | R 6 | P 4 | G 2 | G 6 |

W 3 | Y 4 | W 2 | G 5 | Y 3 | G 3 |

W 4 | Y 5 | B 6 | P 1 | Y 1 | Y 6 |
```
   =======   Connected in original permutation but not all   =======
```
G 5 | B 3 | Y 2 | B 1 | R 4 | Y 5 |

P 5 | Y 3 | W 5 | G 6 | W 2 | G 1 |

G 2 | G 3 | Y 4 | R 1 | B 4 | G 4 |

P 1 | R 6 | P 3 | B 2 | R 5 | Y 6 |

B 6 | R 3 | P 6 | P 4 | P 2 | R 2 |

Y 1 | B 5 | W 1 | W 4 | W 3 | W 6 |
```
   =======   Connected in original permutation but not all   =======

```
R 1 | R 5 | Y 2 | G 6 | Y 5 | G 4 |

Y 3 | W 3 | G 5 | R 4 | G 3 | G 2 |

B 3 | B 1 | W 5 | B 6 | G 1 | P 1 |

R 2 | B 4 | W 2 | W 1 | P 3 | P 6 |

R 3 | W 4 | B 2 | W 6 | Y 1 | Y 6 |

R 6 | P 5 | B 5 | P 4 | P 2 | Y 4 |
```

=======   Connected in original permutation but not all   =======

```
Y 3 | G 5 | R 2 | Y 1 | P 5 | W 1 |

B 6 | W 4 | B 5 | R 3 | R 5 | P 6 |

G 1 | G 3 | G 4 | P 1 | Y 6 | P 3 |

W 2 | P 4 | P 2 | R 6 | R 4 | B 2 |

G 2 | R 1 | B 3 | W 3 | Y 2 | W 5 |

G 6 | B 1 | B 4 | Y 4 | W 6 | Y 5 |
```

=======   Connected in original permutation but not all   =======

```
W 5 | W 3 | W 2 | B 5 | Y 5 | W 1 |

P 1 | B 2 | R 2 | P 5 | R 4 | G 5 |

R 1 | P 6 | W 4 | R 3 | R 5 | B 6 |

B 4 | G 2 | W 6 | G 4 | Y 6 | Y 4 |

G 6 | G 1 | P 4 | G 3 | Y 3 | B 3 |

Y 1 | P 2 | B 1 | P 3 | Y 2 | R 6 |
```

=======   Connected in original permutation but not all   =======

```
G 3 | R 2 | Y 2 | W 3 | B 2 | G 5 |

P 6 | R 3 | G 1 | Y 6 | B 3 | P 4 |

R 5 | G 2 | B 1 | W 1 | W 5 | P 3 |

P 1 | R 4 | G 4 | P 2 | Y 5 | Y 4 |

P 5 | Y 3 | R 6 | Y 1 | B 5 | B 6 |

G 6 | W 4 | R 1 | B 4 | W 2 | W 6 |
```

=======   Connected in original permutation but not all   =======

```
G 1 | P 6 | B 2 | Y 2 | W 1 | B 4 |
```

```
R 4 | P 1 | G 5 | W 5 | B 1 | R 1 |

G 3 | P 4 | G 2 | R 6 | R 5 | W 2 |

G 6 | G 4 | Y 4 | B 6 | W 6 | P 5 |

R 3 | Y 6 | W 4 | B 3 | P 2 | Y 5 |

W 3 | Y 1 | B 5 | Y 3 | P 3 | R 2 |

   =======   Connected in original permutation but not all   =======

R 3 | W 4 | R 1 | B 3 | W 1 | G 4 |

B 6 | G 2 | W 6 | G 5 | Y 5 | P 1 |

G 1 | R 6 | B 2 | R 5 | Y 6 | W 5 |

G 3 | G 6 | W 3 | Y 1 | P 4 | R 2 |

B 4 | Y 3 | W 2 | R 4 | P 6 | P 5 |

B 5 | Y 2 | B 1 | Y 4 | P 3 | P 2 |

   =======   Connected in original permutation but not all   =======

P 3 | B 3 | R 4 | B 4 | R 2 | B 2 |

P 4 | P 2 | Y 1 | P 1 | G 5 | G 2 |

P 5 | R 6 | B 5 | Y 5 | G 1 | P 6 |

G 4 | Y 3 | W 5 | W 2 | Y 6 | W 4 |

G 6 | R 3 | B 6 | W 3 | Y 4 | B 1 |

G 3 | R 1 | W 6 | R 5 | Y 2 | W 1 |

   =======   Connected in original permutation but not all   =======

G 5 | P 5 | G 6 | R 5 | Y 2 | B 2 |

P 2 | G 3 | W 3 | R 2 | G 4 | P 6 |

G 2 | W 4 | G 1 | P 1 | W 5 | P 4 |

Y 6 | R 4 | Y 5 | Y 3 | R 3 | Y 4 |

R 6 | R 1 | P 3 | Y 1 | B 4 | W 6 |

B 3 | B 1 | W 1 | W 2 | B 6 | B 5 |

   =======   Connected in original permutation but not all   =======

R 4 | W 2 | B 2 | B 3 | W 6 | Y 5 |
```

```
W 5 | W 1 | Y 1 | P 3 | Y 3 | R 3 |

B 6 | P 2 | P 6 | W 3 | Y 2 | Y 6 |

P 5 | P 1 | P 4 | G 6 | R 6 | R 1 |

R 5 | Y 4 | W 4 | G 5 | R 2 | G 2 |

B 5 | G 1 | B 1 | B 4 | G 4 | G 3 |
```

======= Connected in original permutation but not all ======

```
R 1 | Y 2 | B 1 | Y 3 | W 1 | B 6 |

W 6 | G 4 | B 5 | B 2 | P 4 | G 5 |

G 6 | G 3 | W 3 | B 3 | B 4 | R 6 |

W 5 | G 2 | G 1 | W 2 | P 6 | P 2 |

Y 6 | Y 1 | Y 4 | R 2 | R 4 | P 1 |

Y 5 | W 4 | P 5 | R 3 | R 5 | P 3 |
```

======= Connected in original permutation but not all ======

```
B 1 | B 6 | P 3 | P 2 | Y 6 | R 2 |

R 5 | P 5 | Y 5 | B 5 | B 4 | B 3 |

P 1 | P 6 | W 4 | G 5 | W 6 | G 1 |

B 2 | P 4 | Y 4 | R 1 | Y 2 | W 3 |

Y 3 | G 4 | G 3 | Y 1 | W 1 | W 2 |

G 2 | G 6 | W 5 | R 6 | R 4 | R 3 |
```

======= Connected in original permutation but not all ======

```
W 3 | W 2 | W 6 | Y 3 | R 5 | B 4 |

P 2 | R 6 | B 5 | R 4 | W 4 | R 3 |

W 5 | B 1 | P 6 | G 6 | P 1 | R 1 |

Y 2 | R 2 | G 1 | B 3 | Y 5 | Y 4 |

Y 6 | G 4 | G 5 | B 2 | W 1 | P 3 |

G 2 | Y 1 | G 3 | B 6 | P 5 | P 4 |
```

======= Connected in original permutation but not all ======

```
P 1 | B 1 | R 2 | Y 5 | W 4 | R 5 |

B 6 | P 3 | W 1 | Y 4 | G 3 | P 4 |
```

```
Y 3 | P 5 | G 4 | P 6 | R 6 | Y 1 |

W 5 | Y 2 | W 2 | B 3 | B 2 | R 3 |

Y 6 | B 4 | R 4 | W 3 | W 6 | G 2 |

R 1 | B 5 | P 2 | G 5 | G 6 | G 1 |

  =======   Connected in original permutation but not all   =======

B 3 | G 3 | P 6 | W 6 | P 1 | W 2 |

G 6 | G 5 | R 6 | P 4 | B 2 | Y 6 |

G 2 | W 5 | W 1 | Y 1 | P 3 | W 4 |

G 1 | P 2 | Y 5 | Y 2 | B 1 | Y 4 |

P 5 | W 3 | G 4 | R 2 | B 5 | B 6 |

Y 3 | R 3 | B 4 | R 4 | R 1 | R 5 |

  =======   Connected in original permutation but not all   =======

R 6 | W 5 | G 1 | Y 2 | P 2 | P 4 |

Y 4 | W 6 | R 4 | P 3 | P 1 | W 3 |

G 6 | P 5 | P 6 | Y 6 | G 3 | B 6 |

G 2 | R 1 | B 2 | Y 5 | R 2 | B 5 |

R 5 | B 1 | B 3 | W 4 | R 3 | B 4 |

W 2 | W 1 | G 4 | G 5 | Y 3 | Y 1 |

  =======   Connected in original permutation but not all   =======

B 3 | B 4 | R 1 | Y 1 | G 2 | G 1 |

G 6 | G 5 | G 3 | Y 6 | Y 3 | Y 4 |

R 3 | R 5 | Y 5 | R 2 | G 4 | Y 2 |

R 4 | W 1 | B 1 | P 4 | P 2 | P 1 |

R 6 | W 5 | W 2 | B 5 | B 2 | W 6 |

W 4 | P 6 | P 3 | B 6 | P 5 | W 3 |

  =======   Connected in original permutation but not all   =======

P 5 | B 3 | W 3 | W 4 | P 1 | G 1 |

B 5 | B 2 | Y 4 | R 4 | P 4 | G 2 |
```

```
Y 3 | G 3 | Y 5 | R 3 | P 2 | B 6 |

G 5 | P 6 | Y 2 | P 3 | W 2 | W 5 |

G 6 | R 6 | W 6 | W 1 | R 2 | R 5 |

Y 6 | G 4 | Y 1 | R 1 | B 1 | B 4 |
```

   =======   Connected in original permutation but not all   =======

```
P 3 | G 1 | W 4 | P 5 | G 6 | G 2 |

B 4 | W 6 | B 1 | G 4 | P 4 | P 6 |

W 1 | G 3 | W 2 | R 6 | R 5 | R 3 |

P 1 | G 5 | Y 2 | B 6 | Y 4 | Y 3 |

R 1 | W 5 | Y 1 | P 2 | B 2 | W 3 |

R 2 | Y 6 | R 4 | Y 5 | B 3 | B 5 |
```

   =======   Connected in original permutation but not all   =======

```
W 3 | P 6 | G 1 | R 4 | P 4 | R 2 |

P 3 | W 2 | P 5 | G 3 | W 6 | Y 5 |

P 1 | R 6 | G 2 | B 2 | G 6 | W 5 |

G 5 | R 5 | R 1 | B 1 | Y 3 | Y 4 |

P 2 | B 6 | R 3 | B 4 | B 3 | B 5 |

W 1 | W 4 | G 4 | Y 2 | Y 1 | Y 6 |
```

   =======   Connected in original permutation but not all   =======

```
G 6 | G 5 | B 5 | P 1 | P 4 | W 2 |

B 1 | Y 2 | P 2 | G 2 | B 2 | R 3 |

Y 4 | R 6 | G 1 | B 6 | Y 6 | G 3 |

B 4 | G 4 | W 3 | P 3 | W 1 | W 6 |

W 5 | W 4 | Y 5 | R 4 | R 5 | R 2 |

B 3 | Y 1 | Y 3 | P 6 | R 1 | P 5 |
```

   =======   Connected in original permutation but not all   =======

```
R 5 | P 2 | G 5 | P 6 | P 3 | B 2 |

P 4 | R 6 | W 6 | R 3 | P 5 | Y 2 |

W 1 | Y 4 | G 1 | Y 5 | G 3 | W 5 |
```

```
G 6 | Y 6 | R 2 | G 2 | R 1 | B 4 |

Y 3 | P 1 | G 4 | R 4 | W 3 | W 2 |

Y 1 | B 3 | B 1 | W 4 | B 5 | B 6 |

   =======   Connected in original permutation but not all   =======

W 6 | P 3 | G 4 | W 2 | Y 4 | B 2 |

Y 6 | P 5 | Y 2 | P 1 | Y 3 | R 1 |

G 6 | R 4 | R 6 | R 5 | G 3 | R 3 |

W 3 | B 1 | R 2 | B 3 | B 5 | W 5 |

Y 1 | W 4 | W 1 | P 6 | P 4 | P 2 |

Y 5 | B 6 | B 4 | G 5 | G 2 | G 1 |

   =======   Connected in original permutation but not all   =======

R 2 | Y 5 | B 1 | P 1 | W 2 | B 3 |

Y 3 | B 5 | B 2 | P 3 | B 6 | R 5 |

R 4 | G 2 | Y 4 | P 2 | P 6 | R 3 |

G 1 | G 6 | G 3 | W 6 | Y 1 | B 4 |

R 6 | W 1 | Y 6 | W 3 | G 4 | G 5 |

P 5 | R 1 | Y 2 | W 5 | W 4 | P 4 |

   =======   Connected in original permutation but not all   =======

W 6 | G 4 | R 5 | R 6 | P 1 | W 4 |

G 5 | G 2 | W 3 | Y 1 | R 2 | B 3 |

R 1 | P 5 | B 1 | R 3 | W 1 | P 4 |

P 6 | W 2 | P 3 | G 1 | B 4 | G 6 |

Y 4 | W 5 | R 4 | B 5 | B 6 | Y 2 |

P 2 | B 2 | G 3 | Y 6 | Y 5 | Y 3 |

   =======   Connected in original permutation but not all   =======

R 4 | P 2 | G 2 | P 4 | G 1 | R 2 |

G 3 | R 3 | W 2 | B 2 | Y 1 | Y 6 |

R 6 | R 1 | P 1 | P 6 | G 4 | R 5 |
```

```
Y 2 | G 5 | B 5 | P 3 | B 1 | W 6 |

P 5 | G 6 | Y 5 | W 3 | B 4 | B 6 |

Y 4 | Y 3 | W 4 | W 1 | W 5 | B 3 |

   =======   Connected in original permutation but not all   =======

P 1 | Y 6 | Y 5 | B 2 | P 3 | G 5 |

P 2 | P 4 | Y 2 | P 5 | W 3 | R 1 |

R 3 | G 6 | W 2 | Y 4 | P 6 | R 5 |

Y 3 | Y 1 | G 1 | B 4 | W 5 | G 4 |

R 6 | W 1 | G 2 | R 2 | W 6 | B 6 |

B 5 | R 4 | G 3 | B 1 | W 4 | B 3 |

   =======   Connected in original permutation but not all   =======

Y 4 | R 2 | R 3 | Y 5 | P 6 | G 6 |

R 5 | Y 6 | W 2 | B 4 | P 4 | B 6 |

R 4 | R 6 | G 4 | G 1 | B 5 | B 3 |

Y 3 | W 1 | R 1 | Y 1 | W 6 | Y 2 |

P 1 | B 2 | W 3 | G 3 | G 5 | P 5 |

G 2 | B 1 | W 4 | W 5 | P 3 | P 2 |

   =======   Connected in original permutation but not all   =======

W 2 | W 6 | B 3 | R 5 | R 3 | W 4 |

B 6 | Y 3 | G 1 | P 2 | W 3 | B 4 |

R 1 | B 1 | G 2 | Y 5 | Y 6 | G 6 |

P 5 | Y 1 | Y 2 | P 6 | W 5 | B 5 |

G 5 | G 3 | P 1 | Y 4 | P 4 | W 1 |

P 3 | R 6 | R 2 | R 4 | G 4 | B 2 |

   =======   Connected in original permutation but not all   =======

P 3 | R 4 | R 2 | R 6 | P 2 | G 4 |

Y 2 | W 3 | R 3 | Y 6 | W 6 | G 2 |

R 1 | G 5 | B 2 | P 1 | B 3 | W 1 |

W 4 | G 1 | R 5 | Y 5 | B 6 | P 4 |
```

Y 4 | W 5 | B 4 | B 5 | Y 1 | B 1 |

W 2 | P 6 | P 5 | Y 3 | G 3 | G 6 |

   =======   Connected in original permutation but not all   =======

R 5 | P 2 | W 6 | G 6 | R 6 | G 2 |

B 5 | G 1 | R 2 | P 6 | G 5 | B 3 |

G 4 | G 3 | B 2 | B 4 | P 4 | W 4 |

P 3 | W 5 | R 3 | R 1 | W 1 | W 3 |

R 4 | P 1 | B 6 | Y 4 | Y 6 | W 2 |

B 1 | P 5 | Y 1 | Y 5 | Y 2 | Y 3 |

   =======   Connected in original permutation but not all   =======

P 3 | W 3 | B 1 | P 5 | B 4 | Y 5 |

G 4 | W 6 | P 4 | G 2 | W 5 | G 6 |

Y 2 | P 1 | P 2 | B 6 | P 6 | W 1 |

Y 6 | Y 4 | B 2 | Y 3 | R 2 | R 6 |

W 4 | W 2 | R 5 | Y 1 | B 3 | R 1 |

G 1 | R 4 | B 5 | G 3 | R 3 | G 5 |

   =======   Connected in original permutation but not all   =======

P 1 | B 4 | R 5 | B 2 | R 2 | B 1 |

P 5 | G 3 | Y 1 | W 3 | P 4 | B 6 |

W 4 | G 5 | W 2 | G 1 | W 1 | G 6 |

B 3 | W 5 | Y 5 | Y 3 | G 2 | P 3 |

B 5 | P 2 | Y 2 | R 3 | R 4 | Y 6 |

W 6 | P 6 | G 4 | R 6 | Y 4 | R 1 |

   =======   Connected in original permutation but not all   =======

Y 1 | P 1 | R 2 | B 1 | B 4 | W 6 |

R 4 | G 5 | G 2 | W 2 | B 3 | W 4 |

R 5 | P 5 | R 6 | W 5 | W 3 | R 1 |

R 3 | W 1 | G 4 | B 5 | Y 6 | P 2 |

P 4 | G 3 | B 2 | P 3 | Y 5 | P 6 |

G 6 | G 1 | B 6 | Y 3 | Y 2 | Y 4 |

  =======   Connected in original permutation but not all   =======

Y 1 | Y 3 | G 3 | R 1 | B 3 | G 6 |

Y 6 | Y 5 | G 2 | W 1 | W 2 | P 4 |

W 6 | R 2 | B 6 | Y 2 | Y 4 | G 4 |

P 3 | B 4 | W 4 | B 2 | W 5 | R 4 |

G 5 | B 1 | R 3 | R 6 | P 1 | G 1 |

W 3 | R 5 | B 5 | P 2 | P 6 | P 5 |

  =======   Connected in original permutation but not all   =======

P 6 | P 3 | Y 3 | R 6 | P 4 | W 3 |

G 4 | W 1 | G 2 | B 5 | P 5 | G 1 |

G 5 | P 2 | P 1 | W 6 | Y 4 | G 3 |

G 6 | Y 1 | Y 6 | Y 5 | R 1 | W 4 |

R 4 | R 2 | W 2 | Y 2 | R 3 | B 3 |

W 5 | B 2 | R 5 | B 6 | B 4 | B 1 |

  =======   Connected in original permutation but not all   =======

G 6 | R 5 | W 2 | B 4 | R 4 | W 6 |

W 3 | B 6 | B 2 | Y 5 | B 3 | G 2 |

R 1 | B 1 | Y 1 | P 6 | B 5 | P 2 |

P 3 | W 5 | W 1 | Y 4 | R 2 | Y 6 |

P 5 | W 4 | G 4 | G 5 | G 1 | Y 2 |

P 1 | P 4 | R 3 | R 6 | G 3 | Y 3 |

  =======   Connected in original permutation but not all   =======

W 2 | P 4 | P 6 | R 6 | Y 5 | P 5 |

P 2 | Y 6 | Y 2 | R 4 | W 6 | W 1 |

B 6 | R 1 | P 1 | Y 1 | Y 3 | Y 4 |

W 5 | P 3 | W 4 | B 4 | G 2 | G 5 |

B 2 | W 3 | R 3 | G 3 | G 4 | G 6 |

G 1 | R 2 | R 5 | B 1 | B 5 | B 3 |

======= Connected in original permutation but not all   =======

W 2 | B 5 | Y 5 | P 4 | G 4 | P 5 |

P 2 | R 3 | W 6 | B 3 | P 3 | W 3 |

P 6 | R 1 | G 5 | R 5 | Y 4 | W 4 |

W 5 | B 2 | B 4 | Y 1 | G 1 | P 1 |

G 6 | Y 2 | G 2 | W 1 | R 4 | R 2 |

B 6 | B 1 | G 3 | R 6 | Y 3 | Y 6 |

======= Connected in original permutation but not all   =======

W 6 | R 4 | Y 4 | B 2 | P 1 | R 1 |

R 5 | B 3 | B 1 | R 3 | R 6 | G 2 |

W 4 | P 4 | G 3 | R 2 | W 1 | W 5 |

W 3 | P 5 | W 2 | Y 2 | P 2 | G 5 |

P 3 | Y 1 | G 4 | B 6 | P 6 | B 5 |

Y 6 | G 1 | B 4 | G 6 | Y 3 | Y 5 |

======= Connected in original permutation but not all   =======

Y 4 | P 1 | Y 3 | Y 6 | P 4 | R 5 |

Y 5 | W 3 | G 3 | B 2 | B 1 | R 4 |

B 3 | B 5 | Y 2 | P 6 | B 4 | P 2 |

B 6 | R 3 | R 2 | G 6 | R 6 | G 5 |

R 1 | G 2 | P 5 | W 6 | G 4 | W 1 |

G 1 | Y 1 | P 3 | W 5 | W 4 | W 2 |

======= Connected in original permutation but not all   =======

B 4 | R 2 | R 5 | G 4 | Y 4 | W 5 |

B 3 | P 6 | Y 3 | B 2 | G 6 | W 1 |

B 5 | W 2 | B 6 | W 6 | Y 6 | P 4 |

Y 5 | B 1 | R 3 | P 1 | R 6 | G 3 |

R 1 | W 3 | G 1 | Y 1 | G 2 | G 5 |

R 4 | Y 2 | W 4 | P 2 | P 3 | P 5 |

 =======   Connected in original permutation but not all   =======

G 1 | Y 6 | R 5 | B 4 | W 4 | W 3 |

W 6 | G 6 | P 2 | R 4 | W 5 | G 2 |

G 3 | G 5 | P 4 | Y 4 | P 6 | B 1 |

Y 3 | B 3 | Y 5 | P 3 | R 6 | R 2 |

G 4 | P 1 | Y 2 | R 1 | B 6 | B 2 |

Y 1 | R 3 | P 5 | W 2 | B 5 | W 1 |

 =======   Connected in original permutation but not all   =======

Y 2 | G 1 | R 5 | R 1 | Y 3 | Y 5 |

Y 4 | R 3 | B 4 | B 3 | W 3 | R 6 |

B 2 | W 5 | Y 6 | P 1 | P 5 | Y 1 |

B 5 | B 6 | R 2 | W 1 | W 4 | G 6 |

P 6 | W 2 | G 3 | P 4 | P 2 | P 3 |

R 4 | W 6 | B 1 | G 4 | G 5 | G 2 |

 =======   Connected in original permutation but not all   =======

R 2 | W 6 | Y 6 | R 5 | P 1 | W 5 |

P 3 | B 6 | W 4 | Y 5 | B 5 | Y 4 |

P 2 | P 6 | Y 1 | B 4 | G 3 | Y 2 |

B 1 | R 1 | W 3 | G 2 | P 5 | P 4 |

Y 3 | W 1 | R 3 | B 3 | R 4 | G 4 |

B 2 | G 1 | R 6 | W 2 | G 5 | G 6 |

 =======   Connected in original permutation but not all   =======

G 3 | Y 5 | B 4 | G 4 | W 5 | G 5 |

P 4 | G 1 | P 3 | Y 6 | R 4 | Y 2 |

R 3 | R 5 | Y 1 | Y 3 | Y 4 | G 2 |

P 1 | B 2 | P 6 | B 1 | P 5 | P 2 |

R 2 | R 6 | R 1 | W 2 | W 6 | B 6 |

B 3 | G 6 | B 5 | W 1 | W 4 | W 3 |

======   Connected in original permutation but not all   =======

W 2 | W 4 | B 5 | Y 2 | R 1 | G 3 |

P 5 | G 2 | B 4 | W 3 | R 4 | W 1 |

G 4 | B 1 | R 3 | Y 3 | Y 4 | G 1 |

B 2 | B 6 | R 6 | W 6 | R 2 | R 5 |

G 6 | G 5 | P 4 | P 1 | W 5 | P 2 |

P 3 | P 6 | B 3 | Y 5 | Y 6 | Y 1 |

======   Connected in original permutation but not all   =======

P 2 | Y 2 | R 6 | B 2 | P 3 | B 6 |

P 1 | P 6 | P 4 | B 5 | G 1 | G 3 |

Y 1 | G 4 | P 5 | W 5 | R 4 | G 2 |

Y 6 | W 1 | B 1 | R 3 | R 5 | W 2 |

W 4 | W 6 | Y 3 | R 1 | B 3 | R 2 |

W 3 | B 4 | Y 5 | G 6 | G 5 | Y 4 |

======   Connected in original permutation but not all   =======

R 5 | B 4 | G 5 | P 4 | P 6 | W 1 |

W 4 | P 5 | P 1 | G 6 | B 5 | G 1 |

P 3 | G 3 | W 5 | Y 1 | R 2 | W 3 |

Y 3 | G 4 | P 2 | W 6 | B 3 | B 2 |

R 4 | B 6 | Y 4 | R 1 | Y 5 | B 1 |

G 2 | W 2 | R 3 | R 6 | Y 2 | Y 6 |

======   Connected in original permutation but not all   =======

W 3 | P 2 | R 5 | R 4 | P 5 | P 4 |

P 6 | G 3 | B 5 | G 2 | R 1 | R 2 |

R 3 | G 1 | G 5 | G 6 | W 5 | W 1 |

G 4 | R 6 | W 2 | Y 1 | P 1 | Y 2 |

Y 4 | B 1 | B 4 | W 6 | W 4 | B 3 |

P 3 | B 6 | Y 6 | B 2 | Y 5 | Y 3 |

```
======     Connected in original permutation but not all     =======

P 6 | R 5 | P 4 | R 4 | G 4 | R 6 |

R 3 | B 2 | R 2 | G 2 | R 1 | B 3 |

Y 3 | P 2 | B 6 | P 1 | G 1 | G 5 |

P 3 | B 1 | W 6 | Y 2 | Y 5 | W 2 |

G 6 | Y 4 | G 3 | Y 6 | P 5 | W 4 |

B 5 | Y 1 | B 4 | W 1 | W 5 | W 3 |

   ======     Connected in original permutation but not all     =======

G 1 | G 3 | G 2 | W 3 | P 2 | P 4 |

Y 3 | R 1 | R 3 | G 4 | W 4 | W 6 |

G 5 | R 5 | P 6 | G 6 | W 1 | B 3 |

P 1 | R 2 | Y 4 | R 6 | R 4 | B 5 |

W 2 | Y 1 | W 5 | Y 2 | B 1 | Y 5 |

Y 6 | B 6 | P 3 | P 5 | B 2 | B 4 |

   ======     Connected in original permutation but not all     =======

G 1 | Y 2 | W 6 | P 5 | B 2 | G 5 |

B 3 | P 1 | G 3 | Y 5 | Y 1 | B 5 |

Y 6 | G 4 | W 4 | B 1 | Y 4 | B 4 |

R 4 | Y 3 | B 6 | P 2 | W 1 | P 6 |

P 4 | G 2 | G 6 | W 3 | W 2 | R 2 |

R 1 | R 5 | R 6 | P 3 | W 5 | R 3 |

   ======     Connected in original permutation but not all     =======

W 2 | P 4 | G 5 | P 3 | G 1 | P 5 |

W 4 | P 2 | B 1 | G 2 | B 5 | B 2 |

Y 5 | P 6 | R 6 | W 1 | B 3 | W 3 |

G 4 | W 5 | W 6 | R 3 | B 4 | P 1 |

G 6 | R 4 | Y 4 | Y 6 | Y 2 | Y 1 |

Y 3 | B 6 | G 3 | R 1 | R 2 | R 5 |

   ======     Connected in original permutation but not all     =======
```

```
Y 1 | W 6 | G 4 | B 1 | P 5 | P 6 |

G 1 | G 3 | R 5 | Y 2 | R 3 | P 2 |

P 4 | P 1 | G 2 | R 1 | P 3 | G 6 |

G 5 | W 4 | W 2 | B 6 | R 4 | W 3 |

W 1 | Y 4 | B 2 | W 5 | R 2 | R 6 |

Y 3 | Y 6 | Y 5 | B 4 | B 3 | B 5 |

  =======  Connected in original permutation but not all   =======

Y 3 | B 6 | B 4 | Y 5 | G 1 | W 3 |

R 4 | G 4 | G 6 | Y 1 | Y 2 | G 5 |

G 2 | P 6 | G 3 | P 1 | W 6 | W 5 |

Y 4 | P 5 | B 2 | Y 6 | P 2 | R 6 |

B 1 | R 3 | P 4 | R 5 | R 1 | W 4 |

P 3 | B 5 | R 2 | B 3 | W 1 | W 2 |

  =======  Connected in original permutation but not all   =======

G 3 | B 5 | W 5 | R 3 | G 6 | R 1 |

R 6 | R 2 | G 5 | R 5 | Y 5 | G 4 |

W 6 | R 4 | G 2 | P 6 | B 6 | B 3 |

B 1 | P 4 | B 4 | W 4 | Y 2 | W 1 |

B 2 | P 2 | Y 1 | Y 4 | P 3 | W 2 |

G 1 | Y 6 | Y 3 | P 5 | P 1 | W 3 |

  =======  Connected in original permutation but not all   =======

G 6 | Y 3 | R 4 | R 6 | B 5 | Y 4 |

W 3 | W 2 | R 2 | P 6 | P 4 | R 1 |

W 5 | Y 1 | Y 2 | Y 6 | G 5 | R 3 |

Y 5 | W 1 | W 6 | P 3 | P 5 | G 2 |

R 5 | B 4 | G 1 | B 3 | B 1 | G 4 |

B 2 | G 3 | W 4 | B 6 | P 2 | P 1 |

  =======  Connected in original permutation but not all   =======
```

```
R 5 | P 5 | Y 4 | B 6 | B 2 | B 4 |

P 6 | Y 3 | P 4 | R 6 | P 1 | Y 6 |

G 2 | G 5 | Y 2 | G 1 | Y 1 | G 3 |

Y 5 | B 3 | W 6 | R 4 | P 3 | W 5 |

W 4 | P 2 | G 4 | R 1 | G 6 | R 2 |

B 1 | W 1 | B 5 | R 3 | W 3 | W 2 |
```

======= Connected in original permutation but not all   =======

```
B 4 | R 2 | P 4 | G 1 | Y 2 | W 1 |

G 4 | R 6 | R 1 | Y 3 | Y 4 | G 5 |

B 5 | W 3 | R 3 | Y 5 | P 6 | G 2 |

B 6 | B 2 | W 2 | R 5 | Y 6 | G 6 |

W 6 | W 5 | G 3 | B 1 | W 4 | P 2 |

B 3 | R 4 | Y 1 | P 3 | P 5 | P 1 |
```

======= Connected in original permutation but not all   =======

```
G 6 | P 6 | R 3 | Y 1 | P 1 | G 2 |

Y 3 | P 2 | P 4 | Y 2 | W 6 | W 3 |

Y 5 | P 3 | R 4 | R 5 | G 4 | W 5 |

B 6 | B 5 | R 1 | W 1 | G 1 | W 2 |

W 4 | Y 6 | Y 4 | B 1 | G 3 | B 3 |

P 5 | R 2 | R 6 | G 5 | B 4 | B 2 |
```

======= Connected in original permutation but not all   =======

```
P 3 | R 2 | G 5 | P 5 | Y 4 | G 2 |

W 6 | P 4 | G 3 | W 4 | R 1 | P 1 |

Y 2 | B 4 | R 4 | G 1 | P 2 | B 3 |

R 3 | G 4 | B 5 | W 3 | W 2 | R 5 |

W 1 | Y 6 | Y 5 | R 6 | W 5 | Y 3 |

B 6 | G 6 | P 6 | B 1 | Y 1 | B 2 |
```

======= Connected in original permutation but not all   =======

```
Y 1 | R 4 | W 5 | B 1 | Y 5 | P 5 |
```

```
G 3 | Y 3 | P 3 | Y 2 | Y 6 | P 4 |

P 2 | B 2 | B 6 | G 5 | B 5 | G 6 |

W 4 | P 1 | B 4 | R 3 | W 2 | W 3 |

G 4 | B 3 | P 6 | G 1 | Y 4 | G 2 |

R 6 | R 1 | W 6 | W 1 | R 2 | R 5 |

    =======   Connected in original permutation but not all   =======

G 5 | G 3 | W 3 | R 2 | B 5 | Y 4 |

B 1 | Y 6 | R 4 | R 3 | P 1 | Y 5 |

G 2 | G 1 | Y 3 | B 3 | B 2 | B 4 |

P 3 | Y 1 | G 6 | P 4 | B 6 | P 5 |

R 1 | R 6 | R 5 | G 4 | W 2 | W 6 |

Y 2 | P 6 | P 2 | W 5 | W 4 | W 1 |

    =======   Connected in original permutation but not all   =======

Y 3 | P 2 | Y 4 | P 5 | R 6 | Y 1 |

Y 6 | W 1 | W 6 | P 1 | W 3 | P 3 |

W 4 | W 2 | W 5 | B 4 | B 1 | B 5 |

G 6 | G 2 | P 4 | B 2 | R 3 | B 6 |

P 6 | R 4 | Y 2 | R 1 | G 1 | B 3 |

Y 5 | R 2 | R 5 | G 4 | G 3 | G 5 |

    =======   Connected in original permutation but not all   =======

B 3 | R 6 | Y 5 | P 5 | B 2 | P 4 |

G 4 | R 2 | G 6 | P 3 | G 1 | R 5 |

W 4 | Y 2 | R 3 | P 6 | P 1 | R 1 |

P 2 | G 5 | R 4 | G 3 | W 3 | B 5 |

G 2 | W 6 | Y 6 | Y 3 | Y 1 | Y 4 |

W 2 | W 1 | W 5 | B 4 | B 6 | B 1 |

    =======   Connected in original permutation but not all   =======

G 6 | Y 1 | R 5 | R 6 | G 5 | W 3 |
```

```
G 3 | R 1 | Y 4 | B 3 | R 2 | W 4 |

R 4 | G 2 | G 4 | P 3 | Y 6 | Y 3 |

Y 5 | Y 2 | P 5 | P 6 | W 1 | G 1 |

W 6 | B 1 | B 4 | B 2 | W 2 | P 4 |

P 1 | R 3 | W 5 | B 6 | B 5 | P 2 |
```

======= Connected in original permutation but not all ======

```
Y 3 | G 3 | P 3 | G 1 | R 1 | B 5 |

W 2 | B 2 | B 4 | G 6 | G 2 | P 1 |

B 3 | R 6 | Y 5 | P 4 | B 6 | Y 4 |

W 6 | P 2 | Y 2 | W 1 | G 4 | Y 1 |

W 4 | P 6 | B 1 | R 5 | R 2 | W 5 |

P 5 | W 3 | R 3 | Y 6 | G 5 | R 4 |
```

======= Connected in original permutation but not all ======

```
G 4 | P 2 | P 1 | Y 1 | B 5 | R 3 |

B 6 | P 6 | P 3 | P 4 | P 5 | B 4 |

Y 5 | W 2 | W 4 | B 3 | G 2 | W 6 |

R 1 | B 1 | G 6 | R 5 | R 2 | Y 6 |

G 5 | R 6 | G 3 | W 3 | W 5 | Y 4 |

Y 2 | G 1 | R 4 | B 2 | W 1 | Y 3 |
```

======= Connected in original permutation but not all ======

```
R 6 | R 1 | B 2 | W 3 | P 2 | G 3 |

P 4 | B 1 | Y 1 | R 2 | G 2 | P 6 |

G 4 | Y 2 | P 1 | G 6 | W 1 | Y 6 |

G 5 | G 1 | W 4 | W 6 | Y 3 | R 5 |

P 3 | R 4 | Y 4 | W 2 | P 5 | Y 5 |

W 5 | B 5 | B 6 | R 3 | B 3 | B 4 |
```

======= Connected in original permutation but not all ======

```
P 2 | G 3 | P 3 | Y 6 | G 1 | P 5 |

W 2 | W 1 | P 1 | P 4 | Y 5 | Y 1 |
```

B 4 | W 5 | B 5 | B 1 | W 3 | G 2 |

R 5 | B 6 | Y 3 | Y 2 | R 2 | B 2 |

P 6 | W 4 | B 3 | G 5 | R 1 | R 6 |

Y 4 | W 6 | R 3 | G 6 | R 4 | G 4 |

   =======   Connected in original permutation but not all   =======

Y 4 | W 6 | R 3 | B 4 | W 1 | B 6 |

W 4 | R 1 | G 5 | B 2 | R 4 | R 5 |

B 3 | P 2 | W 5 | P 4 | Y 6 | Y 1 |

B 1 | W 2 | R 6 | P 5 | Y 5 | G 6 |

P 1 | Y 2 | P 3 | W 3 | G 4 | G 3 |

B 5 | Y 3 | R 2 | G 1 | G 2 | P 6 |

   =======   Connected in original permutation but not all   =======

Y 1 | R 5 | G 2 | R 3 | R 6 | B 5 |

Y 4 | G 5 | W 4 | P 5 | B 3 | B 6 |

Y 3 | Y 6 | G 4 | Y 2 | G 1 | W 6 |

W 5 | Y 5 | P 6 | P 2 | B 1 | G 6 |

B 2 | P 3 | R 4 | R 1 | G 3 | R 2 |

B 4 | P 1 | W 3 | W 1 | W 2 | P 4 |

   =======   Connected in original permutation but not all   =======

Y 5 | W 4 | G 1 | W 6 | W 2 | R 4 |

R 6 | G 3 | P 1 | B 2 | Y 2 | R 1 |

P 3 | B 5 | B 6 | B 1 | B 4 | Y 3 |

Y 1 | R 3 | P 5 | W 1 | G 4 | W 3 |

B 3 | G 6 | R 2 | W 5 | Y 4 | P 2 |

G 2 | R 5 | G 5 | Y 6 | P 4 | P 6 |

   =======   Connected in original permutation but not all   =======

B 2 | Y 3 | B 5 | Y 1 | G 2 | W 3 |

B 4 | P 1 | P 6 | W 6 | P 2 | B 6 |

```
B 3 | P 5 | B 1 | W 4 | W 5 | W 2 |

Y 4 | R 1 | G 1 | Y 5 | R 6 | R 2 |

Y 2 | R 5 | P 4 | G 5 | G 6 | W 1 |

G 3 | Y 6 | G 4 | R 4 | R 3 | P 3 |

  =======   Connected in original permutation but not all   =======

P 1 | G 5 | P 6 | P 2 | W 5 | B 1 |

G 4 | W 2 | P 5 | R 6 | P 3 | G 1 |

Y 3 | B 6 | R 1 | Y 2 | W 1 | R 3 |

G 6 | P 4 | G 3 | G 2 | Y 1 | W 4 |

B 5 | R 5 | B 3 | Y 5 | W 3 | R 2 |

B 4 | B 2 | Y 4 | Y 6 | R 4 | W 6 |

  =======   Connected in original permutation but not all   =======

Y 1 | Y 4 | Y 3 | P 2 | Y 2 | W 3 |

W 2 | R 6 | R 3 | P 3 | R 4 | R 2 |

W 1 | P 4 | R 5 | W 4 | R 1 | Y 5 |

Y 6 | G 1 | B 6 | W 6 | B 2 | B 4 |

P 1 | W 5 | B 3 | G 3 | G 2 | P 5 |

G 4 | G 6 | B 1 | B 5 | P 6 | G 5 |

  =======   Connected in original permutation but not all   =======

Y 4 | B 5 | Y 2 | P 6 | Y 5 | G 6 |

P 2 | R 1 | B 2 | R 4 | R 5 | B 6 |

B 1 | R 6 | R 2 | B 3 | Y 1 | R 3 |

Y 3 | P 4 | W 1 | W 3 | G 5 | W 5 |

P 3 | B 4 | W 4 | W 6 | W 2 | G 3 |

Y 6 | P 5 | P 1 | G 2 | G 4 | G 1 |

  =======   Connected in original permutation but not all   =======

G 3 | Y 5 | W 5 | Y 6 | G 2 | R 1 |

W 1 | Y 4 | G 6 | G 5 | Y 3 | G 1 |

W 2 | B 3 | B 5 | G 4 | W 3 | R 3 |
```

```
Y 2 | W 4 | Y 1 | B 1 | P 5 | R 2 |

R 5 | R 4 | W 6 | P 1 | P 3 | B 4 |

B 2 | B 6 | P 6 | P 4 | P 2 | R 6 |

   =======   Connected in original permutation but not all   =======

R 3 | P 1 | B 3 | B 2 | R 5 | B 6 |

W 4 | B 1 | Y 4 | P 4 | R 1 | B 5 |

B 4 | P 2 | G 2 | Y 2 | G 6 | P 5 |

W 6 | Y 3 | G 1 | W 2 | G 3 | Y 1 |

W 5 | W 1 | P 6 | W 3 | R 6 | P 3 |

R 2 | R 4 | Y 6 | Y 5 | G 5 | G 4 |

   =======   Connected in original permutation but not all   =======

G 5 | P 2 | Y 2 | Y 5 | R 1 | R 6 |

R 5 | W 2 | Y 3 | R 2 | R 3 | W 1 |

Y 4 | B 3 | R 4 | B 4 | Y 1 | Y 6 |

G 1 | G 4 | P 3 | W 4 | B 6 | G 3 |

B 5 | B 2 | P 6 | W 5 | G 2 | W 3 |

G 6 | P 5 | P 4 | W 6 | B 1 | P 1 |

   =======   Connected in original permutation but not all   =======

P 3 | B 1 | B 5 | R 5 | W 1 | B 3 |

G 1 | B 4 | B 6 | R 6 | G 6 | R 1 |

R 4 | Y 4 | P 1 | Y 2 | Y 3 | Y 1 |

P 2 | P 5 | W 3 | R 2 | G 5 | W 6 |

P 4 | B 2 | P 6 | G 2 | W 4 | G 4 |

R 3 | W 2 | Y 5 | G 3 | W 5 | Y 6 |

   =======   Connected in original permutation but not all   =======

Y 1 | P 6 | P 2 | W 4 | B 6 | R 6 |

P 5 | W 1 | R 2 | W 6 | B 1 | Y 4 |

W 2 | Y 3 | B 4 | Y 5 | R 1 | G 4 |
```

B 2 | G 1 | R 5 | B 3 | G 3 | P 1 |

P 4 | G 5 | B 5 | W 5 | P 3 | Y 2 |

Y 6 | G 6 | G 2 | R 4 | W 3 | R 3 |

    ======= Connected in original permutation but not all   =======

B 5 | B 6 | B 4 | W 3 | P 3 | P 4 |

W 6 | B 2 | B 1 | R 1 | Y 3 | G 4 |

W 5 | G 2 | P 1 | W 4 | B 3 | W 2 |

R 2 | P 6 | P 5 | P 2 | Y 6 | G 1 |

Y 2 | G 6 | G 5 | R 5 | R 4 | R 6 |

W 1 | G 3 | Y 5 | Y 4 | Y 1 | R 3 |

    ======= Connected in original permutation but not all   =======

B 5 | P 2 | R 6 | Y 4 | G 4 | Y 2 |

Y 6 | B 1 | W 2 | G 5 | B 6 | W 5 |

P 3 | P 1 | P 4 | P 5 | B 2 | G 3 |

G 6 | B 3 | G 1 | Y 1 | R 1 | G 2 |

B 4 | R 5 | W 1 | Y 5 | W 3 | R 4 |

W 6 | Y 3 | P 6 | W 4 | R 2 | R 3 |

    ======= Connected in original permutation but not all   =======

G 5 | B 3 | R 6 | Y 2 | W 3 | P 6 |

P 2 | P 4 | Y 1 | Y 6 | P 3 | P 1 |

G 6 | P 5 | W 2 | B 4 | R 1 | Y 5 |

R 2 | Y 3 | B 5 | G 1 | W 1 | B 1 |

G 4 | Y 4 | W 6 | B 2 | B 6 | G 3 |

G 2 | W 5 | W 4 | R 3 | R 5 | R 4 |

    ======= Connected in original permutation but not all   =======

B 2 | Y 5 | B 1 | G 6 | R 6 | W 3 |

B 3 | G 3 | G 2 | B 4 | G 5 | R 4 |

Y 4 | B 6 | P 4 | B 5 | Y 1 | R 1 |

R 3 | Y 2 | G 1 | P 6 | P 3 | G 4 |

```
W 2 | W 5 | R 2 | P 1 | P 5 | P 2 |

R 5 | Y 3 | Y 6 | W 6 | W 1 | W 4 |

   =======   Connected in original permutation but not all   =======

P 5 | P 2 | P 3 | W 3 | B 6 | B 2 |

P 1 | Y 6 | B 4 | B 3 | B 1 | Y 1 |

W 1 | P 4 | P 6 | B 5 | R 1 | R 5 |

W 5 | G 5 | Y 4 | R 4 | W 6 | Y 3 |

Y 5 | R 2 | W 4 | R 3 | G 1 | W 2 |

R 6 | G 2 | Y 2 | G 3 | G 6 | G 4 |

   =======   Connected in original permutation but not all   =======

P 2 | R 4 | W 5 | G 5 | W 3 | P 5 |

P 1 | G 3 | Y 1 | Y 2 | R 6 | G 1 |

R 1 | W 4 | B 4 | R 2 | B 6 | G 2 |

W 1 | R 3 | G 4 | Y 5 | P 6 | B 3 |

Y 3 | P 3 | R 5 | Y 4 | W 6 | Y 6 |

B 5 | B 1 | G 6 | P 4 | B 2 | W 2 |

   =======   Connected in original permutation but not all   =======

P 4 | R 3 | Y 3 | Y 6 | B 3 | Y 5 |

G 2 | R 5 | B 2 | B 1 | W 4 | B 5 |

R 4 | Y 1 | Y 4 | Y 2 | R 1 | G 4 |

B 4 | B 6 | P 1 | P 2 | P 3 | P 6 |

W 6 | R 6 | P 5 | W 5 | W 3 | G 3 |

G 5 | R 2 | G 6 | W 2 | W 1 | G 1 |

   =======   Connected in original permutation but not all   =======

R 3 | W 6 | Y 3 | G 3 | Y 4 | B 2 |

Y 6 | R 5 | G 4 | P 6 | G 1 | G 6 |

W 2 | W 4 | P 2 | G 2 | G 5 | W 5 |

R 4 | B 1 | R 1 | P 5 | W 3 | W 1 |
```

```
B 6 | Y 5 | Y 1 | R 6 | P 1 | Y 2 |

P 3 | B 4 | P 4 | R 2 | B 3 | B 5 |

   =======   Connected in original permutation but not all   =======

Y 1 | G 3 | Y 5 | B 6 | R 2 | B 5 |

Y 6 | Y 3 | G 2 | G 5 | W 2 | Y 2 |

B 1 | G 6 | P 1 | B 4 | G 4 | B 2 |

G 1 | P 6 | B 3 | Y 4 | R 1 | W 5 |

P 3 | W 6 | W 3 | R 6 | P 4 | R 4 |

R 3 | W 1 | R 5 | W 4 | P 5 | P 2 |

   =======   Connected in original permutation but not all   =======

G 5 | P 5 | Y 1 | B 3 | W 1 | G 6 |

W 3 | Y 3 | B 6 | P 4 | B 2 | P 1 |

P 6 | R 6 | W 2 | R 3 | P 2 | G 3 |

W 6 | W 5 | R 2 | W 4 | R 1 | Y 4 |

B 4 | Y 6 | R 5 | Y 2 | R 4 | B 5 |

P 3 | B 1 | G 2 | Y 5 | G 1 | G 4 |

   =======   Connected in original permutation but not all   =======

G 2 | P 3 | R 5 | G 6 | R 6 | W 5 |

W 3 | G 1 | B 1 | P 6 | R 2 | R 3 |

G 5 | W 1 | W 2 | G 3 | W 4 | Y 4 |

G 4 | R 4 | B 4 | P 2 | B 5 | P 5 |

W 6 | P 4 | R 1 | P 1 | Y 3 | B 3 |

Y 1 | B 6 | Y 2 | Y 5 | Y 6 | B 2 |

   =======   Connected in original permutation but not all   =======

W 4 | W 3 | P 2 | W 5 | W 2 | G 2 |

Y 2 | W 6 | P 6 | R 6 | B 5 | G 4 |

G 1 | R 3 | P 4 | Y 4 | R 4 | P 1 |

P 3 | G 6 | Y 1 | G 3 | R 1 | R 2 |

Y 3 | W 1 | B 2 | R 5 | B 3 | Y 5 |
```

P 5 | Y 6 | G 5 | B 6 | B 4 | B 1 |

    =======   Connected in original permutation but not all   =======

B 4 | B 3 | B 1 | R 3 | Y 2 | Y 5 |

P 5 | W 3 | B 5 | P 4 | W 4 | W 6 |

R 1 | B 2 | B 6 | G 6 | R 4 | P 6 |

R 6 | G 4 | Y 6 | P 1 | G 1 | G 3 |

W 1 | P 3 | P 2 | W 5 | R 5 | Y 4 |

R 2 | W 2 | G 2 | Y 3 | Y 1 | G 5 |

    =======   Connected in original permutation but not all   =======

G 3 | B 5 | P 5 | R 4 | G 2 | G 1 |

B 6 | P 4 | W 4 | R 2 | R 1 | B 4 |

R 6 | B 2 | P 1 | B 1 | Y 2 | G 6 |

Y 4 | R 5 | Y 3 | G 4 | W 1 | P 2 |

Y 6 | Y 1 | B 3 | P 3 | P 6 | W 2 |

Y 5 | W 3 | R 3 | G 5 | W 5 | W 6 |

    =======   Connected in original permutation but not all   =======

W 1 | P 5 | G 1 | R 4 | W 4 | R 6 |

P 3 | G 5 | G 4 | P 1 | R 3 | W 2 |

G 2 | W 5 | P 2 | R 5 | W 6 | Y 2 |

P 4 | R 2 | P 6 | Y 4 | B 6 | Y 3 |

W 3 | R 1 | Y 5 | Y 6 | B 1 | B 2 |

G 6 | G 3 | Y 1 | B 3 | B 4 | B 5 |

    =======   Connected in original permutation but not all   =======

Y 5 | Y 2 | R 2 | G 3 | P 5 | B 6 |

R 3 | Y 1 | G 6 | G 4 | R 4 | P 2 |

G 5 | Y 4 | W 5 | B 1 | B 5 | G 1 |

B 2 | R 6 | P 1 | P 4 | B 3 | P 6 |

Y 3 | Y 6 | P 3 | G 2 | W 1 | W 3 |

```
W 4 | W 6 | B 4 | R 5 | R 1 | W 2 |

   =======   Connected in original permutation but not all   =======

Y 2 | P 3 | R 2 | P 5 | G 6 | R 6 |

Y 6 | W 5 | Y 5 | B 1 | Y 4 | Y 3 |

W 4 | R 3 | W 6 | W 1 | B 3 | W 2 |

Y 1 | G 5 | B 4 | P 6 | B 6 | G 1 |

P 4 | G 4 | B 5 | W 3 | B 2 | R 5 |

P 1 | G 2 | P 2 | R 4 | R 1 | G 3 |

   =======   Connected in original permutation but not all   =======

Y 6 | P 3 | P 2 | W 1 | W 3 | B 4 |

B 1 | W 6 | G 2 | R 1 | W 5 | G 1 |

P 6 | Y 2 | G 5 | P 1 | B 6 | Y 4 |

Y 1 | R 2 | B 3 | Y 5 | P 5 | G 6 |

B 5 | B 2 | R 4 | G 4 | G 3 | W 4 |

R 6 | P 4 | Y 3 | W 2 | R 5 | R 3 |

   =======   Connected in original permutation but not all   =======

R 3 | W 4 | W 2 | R 1 | W 1 | P 1 |

Y 5 | Y 3 | G 5 | W 6 | R 2 | P 6 |

R 6 | G 6 | G 4 | R 4 | G 3 | Y 2 |

B 2 | B 4 | W 3 | B 5 | P 4 | B 6 |

B 1 | W 5 | R 5 | G 1 | P 3 | Y 6 |

B 3 | G 2 | Y 1 | Y 4 | P 2 | P 5 |

   =======   Connected in original permutation but not all   =======

G 1 | W 6 | G 2 | B 1 | Y 1 | B 3 |

Y 3 | R 2 | W 1 | R 4 | P 1 | G 6 |

B 6 | Y 6 | P 4 | B 5 | Y 4 | B 4 |

Y 5 | W 4 | G 3 | W 2 | W 3 | G 5 |

B 2 | P 2 | Y 2 | P 6 | W 5 | R 1 |

P 5 | P 3 | G 4 | R 5 | R 3 | R 6 |
```

======   Connected in original permutation but not all   =======

P 6 | W 5 | G 1 | B 6 | W 4 | Y 5 |

P 4 | G 2 | G 4 | R 3 | Y 3 | R 6 |

Y 4 | Y 2 | R 5 | P 1 | R 1 | P 5 |

P 2 | R 2 | Y 1 | B 1 | W 6 | G 6 |

B 5 | R 4 | B 2 | B 3 | G 5 | W 1 |

G 3 | P 3 | Y 6 | B 4 | W 3 | W 2 |

======   Connected in original permutation but not all   =======

Y 1 | R 3 | G 6 | B 1 | W 6 | Y 4 |

Y 6 | P 5 | R 2 | P 6 | B 6 | B 5 |

G 5 | P 2 | R 4 | Y 5 | G 3 | R 5 |

W 3 | B 3 | Y 3 | R 6 | P 1 | B 2 |

G 1 | R 1 | B 4 | Y 2 | P 3 | W 2 |

G 2 | G 4 | W 1 | P 4 | W 5 | W 4 |

======   Connected in original permutation but not all   =======

P 5 | W 6 | R 2 | G 4 | B 6 | W 2 |

G 6 | P 3 | R 5 | P 1 | G 2 | W 5 |

P 6 | P 2 | Y 3 | P 4 | G 1 | Y 1 |

B 2 | B 5 | R 6 | W 4 | W 3 | B 3 |

G 3 | R 1 | G 5 | B 4 | R 3 | Y 6 |

Y 2 | Y 5 | B 1 | Y 4 | R 4 | W 1 |

======   Connected in original permutation but not all   =======

P 4 | G 2 | G 4 | G 5 | B 3 | P 2 |

B 4 | W 2 | P 5 | R 1 | B 6 | G 6 |

Y 6 | B 2 | R 5 | P 3 | W 6 | W 3 |

B 1 | G 3 | G 1 | Y 4 | Y 3 | Y 1 |

Y 5 | B 5 | R 3 | R 4 | W 1 | R 6 |

P 1 | P 6 | W 4 | Y 2 | R 2 | W 5 |

=======   Connected in original permutation but not all   =======

Y 1 | P 1 | W 6 | G 1 | R 3 | Y 2 |

Y 3 | R 1 | B 2 | Y 6 | P 2 | G 4 |

Y 5 | W 2 | P 5 | G 2 | W 5 | G 3 |

P 3 | W 4 | Y 4 | B 5 | W 3 | B 6 |

P 6 | B 3 | G 6 | B 1 | R 2 | R 4 |

R 6 | W 1 | P 4 | B 4 | G 5 | R 5 |

=======   Connected in original permutation but not all   =======

R 4 | R 6 | B 1 | Y 3 | P 3 | W 2 |

P 1 | P 6 | P 2 | W 5 | P 4 | W 3 |

W 6 | G 4 | W 1 | W 4 | R 3 | G 1 |

P 5 | Y 1 | Y 5 | G 5 | Y 6 | R 5 |

B 2 | Y 4 | Y 2 | R 2 | G 3 | G 6 |

B 4 | B 3 | G 2 | B 5 | R 1 | B 6 |

=======   Connected in original permutation but not all   =======

Y 2 | W 3 | R 4 | Y 4 | Y 1 | Y 3 |

B 3 | P 6 | W 5 | R 6 | P 3 | G 6 |

B 1 | Y 5 | R 1 | W 4 | R 5 | R 2 |

P 1 | R 3 | Y 6 | G 4 | B 6 | B 5 |

W 1 | W 2 | P 5 | B 4 | G 5 | G 1 |

P 4 | P 2 | W 6 | G 2 | B 2 | G 3 |

=======   Connected in original permutation but not all   =======

W 1 | B 4 | R 1 | P 2 | Y 1 | R 6 |

G 4 | Y 6 | R 4 | R 2 | B 6 | W 2 |

Y 3 | P 3 | G 6 | Y 5 | R 3 | R 5 |

G 5 | P 4 | G 2 | B 3 | W 6 | P 1 |

W 3 | P 5 | Y 2 | W 4 | W 5 | P 6 |

G 1 | G 3 | Y 4 | B 5 | B 1 | B 2 |

=======   Connected in original permutation but not all   =======

```
W 3 | B 4 | G 4 | Y 4 | P 5 | P 6 |

G 2 | Y 1 | P 1 | P 3 | B 1 | P 4 |

R 6 | B 5 | G 3 | Y 2 | P 2 | Y 6 |

G 5 | W 4 | R 1 | R 5 | R 2 | G 6 |

R 3 | Y 5 | R 4 | W 2 | W 1 | W 6 |

G 1 | W 5 | Y 3 | B 3 | B 6 | B 2 |

   =======   Connected in original permutation but not all   =======

G 1 | P 2 | B 6 | B 5 | P 6 | R 2 |

P 4 | R 1 | G 4 | Y 1 | P 1 | W 1 |

Y 4 | R 4 | Y 2 | Y 5 | G 2 | G 5 |

P 3 | B 3 | Y 3 | W 5 | B 2 | B 1 |

G 6 | Y 6 | R 5 | R 6 | W 2 | G 3 |

W 6 | P 5 | R 3 | W 3 | B 4 | W 4 |

   =======   Connected in original permutation but not all   =======

R 3 | P 3 | B 5 | W 1 | P 4 | W 4 |

P 5 | B 3 | R 6 | B 2 | W 5 | R 1 |

P 2 | P 1 | B 6 | R 4 | Y 3 | B 1 |

Y 6 | P 6 | Y 1 | G 1 | B 4 | W 3 |

Y 5 | Y 4 | W 6 | R 5 | G 2 | G 5 |

Y 2 | W 2 | R 2 | G 4 | G 3 | G 6 |

   =======   Connected in original permutation but not all   =======

W 2 | W 3 | W 1 | W 4 | W 6 | G 4 |

Y 6 | P 2 | W 5 | R 2 | R 4 | Y 5 |

B 2 | P 1 | P 3 | G 3 | B 1 | P 4 |

P 6 | Y 1 | R 3 | P 5 | B 4 | R 5 |

Y 2 | B 5 | B 6 | Y 4 | Y 3 | B 3 |

G 1 | G 5 | G 2 | R 6 | G 6 | R 1 |

   =======   Connected in original permutation but not all   =======
```

```
Y 3 | B 6 | Y 1 | R 1 | Y 2 | P 2 |

Y 5 | P 6 | R 5 | G 4 | R 4 | Y 4 |

W 1 | G 1 | W 3 | R 2 | G 5 | W 2 |

B 3 | P 3 | R 3 | W 4 | Y 6 | P 4 |

B 4 | G 3 | W 6 | B 1 | B 2 | B 5 |

P 1 | P 5 | R 6 | G 2 | W 5 | G 6 |
```

   =======   Connected in original permutation but not all   =======

```
B 1 | Y 3 | B 3 | R 6 | P 1 | Y 6 |

R 5 | R 3 | G 1 | P 6 | W 2 | G 5 |

B 5 | W 5 | P 5 | W 3 | W 4 | B 6 |

P 2 | Y 4 | R 1 | Y 2 | R 4 | Y 1 |

P 4 | W 6 | B 2 | Y 5 | B 4 | G 2 |

R 2 | P 3 | W 1 | G 6 | G 4 | G 3 |
```

   =======   Connected in original permutation but not all   =======

```
Y 6 | Y 2 | P 1 | G 4 | R 6 | G 6 |

B 2 | G 1 | G 5 | G 2 | R 2 | G 3 |

Y 3 | Y 4 | R 4 | W 2 | P 3 | Y 5 |

R 3 | B 3 | P 6 | P 2 | B 5 | Y 1 |

R 1 | R 5 | W 5 | W 3 | P 4 | B 4 |

B 6 | P 5 | W 1 | W 6 | W 4 | B 1 |
```

  ==========   Connected in every permutation   =========

```
R 2 | W 2 | P 4 | W 1 | W 3 | R 1 |

G 2 | P 3 | W 5 | R 3 | P 5 | R 5 |

G 6 | W 6 | W 4 | G 3 | B 6 | G 4 |

G 1 | G 5 | B 1 | B 4 | Y 1 | Y 4 |

B 2 | Y 2 | Y 5 | P 1 | Y 3 | P 6 |

R 4 | B 5 | B 3 | P 2 | Y 6 | R 6 |
```

   =======   Connected in original permutation but not all   =======

```
Y 1 | Y 6 | B 6 | W 4 | W 6 | R 4 |
```

```
B 2 | R 3 | G 6 | P 6 | B 5 | P 2 |

Y 4 | R 5 | B 4 | P 4 | B 1 | P 1 |

B 3 | Y 3 | G 1 | P 3 | W 1 | R 6 |

W 5 | Y 5 | R 1 | G 4 | W 3 | G 2 |

R 2 | Y 2 | P 5 | W 2 | G 5 | G 3 |

   =======   Connected in original permutation but not all   =======

Y 1 | G 5 | Y 2 | Y 4 | R 3 | B 2 |

P 3 | B 4 | W 2 | W 3 | R 1 | G 3 |

Y 6 | B 1 | R 5 | B 6 | R 2 | Y 5 |

B 3 | P 4 | R 4 | W 6 | W 1 | G 1 |

W 4 | B 5 | Y 3 | W 5 | P 1 | G 2 |

P 5 | R 6 | P 2 | P 6 | G 6 | G 4 |

   =======   Connected in original permutation but not all   =======

B 1 | P 3 | P 6 | R 6 | Y 5 | B 3 |

Y 6 | P 5 | R 3 | B 5 | W 1 | W 5 |

R 2 | R 5 | Y 4 | G 6 | W 3 | P 1 |

R 1 | R 4 | W 4 | G 2 | W 2 | P 2 |

G 4 | W 6 | G 3 | B 6 | G 5 | G 1 |

Y 3 | P 4 | B 2 | B 4 | Y 2 | Y 1 |

   =======   Connected in original permutation but not all   =======

R 2 | P 5 | W 5 | R 5 | R 6 | R 4 |

P 2 | R 1 | B 5 | Y 4 | G 2 | B 6 |

B 1 | G 3 | R 3 | W 3 | Y 1 | B 2 |

W 6 | W 4 | Y 5 | Y 3 | G 4 | P 6 |

Y 2 | P 1 | G 6 | Y 6 | P 3 | B 3 |

W 2 | G 1 | W 1 | G 5 | P 4 | B 4 |

   =======   Connected in original permutation but not all   =======

P 4 | R 3 | W 2 | R 2 | P 3 | W 6 |
```

```
B 2 | W 1 | R 1 | W 4 | R 4 | W 5 |

W 3 | Y 1 | R 5 | P 6 | Y 6 | P 1 |

B 3 | Y 3 | Y 5 | R 6 | G 2 | B 1 |

P 5 | G 1 | P 2 | G 3 | G 4 | B 5 |

Y 4 | G 6 | G 5 | Y 2 | B 4 | B 6 |
```

======= Connected in original permutation but not all =======

```
P 2 | Y 6 | B 1 | R 1 | B 4 | G 5 |

W 5 | R 5 | Y 2 | Y 4 | W 3 | R 3 |

Y 1 | B 6 | R 6 | G 6 | W 1 | Y 3 |

R 4 | W 4 | P 4 | P 3 | P 6 | W 2 |

P 1 | Y 5 | P 5 | G 4 | G 1 | G 3 |

W 6 | G 2 | R 2 | B 3 | B 5 | B 2 |
```

======= Connected in original permutation but not all =======

```
P 5 | P 6 | Y 2 | P 3 | W 1 | W 2 |

Y 4 | P 2 | Y 5 | B 4 | B 3 | W 4 |

G 1 | R 5 | R 3 | B 1 | Y 1 | R 2 |

Y 3 | W 5 | Y 6 | R 4 | G 3 | B 6 |

W 3 | P 1 | P 4 | B 5 | G 2 | G 6 |

G 5 | R 6 | W 6 | B 2 | G 4 | R 1 |
```

======= Connected in original permutation but not all =======

```
W 2 | Y 6 | B 6 | P 6 | B 3 | B 4 |

W 1 | W 5 | G 3 | G 1 | B 1 | B 5 |

R 4 | B 2 | P 5 | R 5 | Y 3 | P 4 |

W 4 | Y 2 | Y 1 | G 5 | P 2 | G 6 |

Y 4 | G 4 | W 6 | G 2 | P 1 | R 3 |

W 3 | Y 5 | R 2 | R 1 | P 3 | R 6 |
```

======= Connected in original permutation but not all =======

```
P 6 | B 5 | W 1 | P 3 | W 4 | P 1 |

R 3 | P 5 | W 3 | Y 3 | Y 1 | R 6 |
```

```
G 4 | Y 2 | B 6 | P 2 | R 2 | G 5 |

G 1 | W 2 | Y 5 | R 5 | Y 6 | R 4 |

R 1 | G 2 | P 4 | B 2 | W 6 | Y 4 |

G 3 | B 4 | G 6 | W 5 | B 1 | B 3 |
    =======   Connected in original permutation but not all   =======
Y 1 | G 2 | R 6 | B 6 | W 5 | W 6 |

Y 6 | P 4 | G 6 | R 3 | P 1 | R 1 |

W 3 | Y 5 | Y 4 | P 6 | G 1 | Y 3 |

B 5 | Y 2 | G 3 | W 2 | W 1 | R 4 |

R 5 | W 4 | R 2 | B 4 | B 3 | P 3 |

G 5 | P 2 | B 2 | P 5 | G 4 | B 1 |
    =======   Connected in original permutation but not all   =======
G 1 | W 1 | Y 1 | R 2 | Y 5 | B 4 |

Y 4 | B 2 | W 6 | R 3 | R 5 | W 4 |

W 3 | G 4 | Y 2 | G 5 | G 6 | Y 6 |

Y 3 | P 6 | B 3 | G 2 | R 1 | B 6 |

W 2 | W 5 | R 6 | R 4 | B 1 | P 5 |

G 3 | B 5 | P 4 | P 3 | P 1 | P 2 |
    =======   Connected in original permutation but not all   =======
B 5 | R 5 | R 1 | G 4 | R 2 | Y 5 |

P 1 | W 2 | R 6 | B 6 | B 1 | Y 6 |

P 5 | G 5 | Y 3 | R 4 | P 2 | R 3 |

W 5 | W 4 | G 6 | G 2 | P 3 | P 4 |

W 1 | B 2 | W 6 | B 4 | G 1 | G 3 |

W 3 | Y 2 | P 6 | B 3 | Y 4 | Y 1 |
    =======   Connected in original permutation but not all   =======
W 2 | G 3 | W 1 | Y 3 | P 2 | G 4 |

R 4 | W 5 | Y 2 | G 1 | R 1 | B 4 |
```

```
W 4 | W 3 | R 6 | P 6 | R 2 | R 5 |

P 4 | P 3 | Y 5 | B 5 | Y 1 | B 1 |

W 6 | B 2 | P 1 | G 5 | G 6 | B 6 |

P 5 | R 3 | B 3 | G 2 | Y 6 | Y 4 |
```

======= Connected in original permutation but not all =======

```
P 6 | W 3 | G 3 | W 4 | P 4 | P 3 |

G 6 | R 5 | B 4 | P 5 | G 5 | R 2 |

R 4 | Y 5 | P 2 | G 1 | P 1 | R 6 |

R 1 | Y 2 | W 6 | Y 6 | W 2 | W 1 |

G 4 | B 1 | G 2 | B 5 | B 2 | W 5 |

R 3 | Y 1 | B 3 | Y 3 | B 6 | Y 4 |
```

======= Connected in original permutation but not all =======

```
W 4 | B 1 | R 4 | B 5 | Y 5 | Y 2 |

P 6 | P 1 | G 5 | P 4 | G 6 | Y 6 |

R 5 | W 1 | B 4 | G 1 | B 6 | Y 1 |

R 2 | B 2 | B 3 | P 5 | G 3 | W 2 |

Y 4 | R 1 | Y 3 | R 6 | P 3 | G 2 |

P 2 | R 3 | G 4 | W 5 | W 6 | W 3 |
```

======= Connected in original permutation but not all =======

```
G 2 | B 1 | B 2 | W 3 | Y 3 | W 4 |

G 5 | R 3 | R 6 | R 5 | Y 5 | Y 1 |

W 5 | R 2 | G 1 | G 6 | W 6 | W 1 |

P 4 | B 5 | P 1 | Y 2 | G 4 | Y 4 |

B 3 | P 5 | P 2 | P 3 | Y 6 | R 4 |

W 2 | R 1 | G 3 | P 6 | B 6 | B 4 |
```

======= Connected in original permutation but not all =======

```
R 3 | Y 3 | W 2 | P 4 | P 3 | R 5 |

W 3 | Y 2 | B 5 | W 4 | B 1 | P 5 |

W 6 | W 5 | W 1 | R 6 | R 2 | R 4 |
```

P 6 | P 1 | P 2 | B 3 | Y 1 | B 6 |

B 4 | G 3 | Y 6 | G 1 | B 2 | G 4 |

Y 4 | R 1 | Y 5 | G 5 | G 6 | G 2 |

======= Connected in original permutation but not all ======

Y 2 | W 5 | G 3 | W 6 | P 6 | W 2 |

W 3 | B 2 | Y 4 | W 1 | G 5 | Y 6 |

R 6 | G 2 | P 3 | R 2 | G 1 | G 6 |

Y 1 | Y 5 | Y 3 | G 4 | P 2 | B 4 |

B 5 | P 5 | W 4 | P 1 | R 1 | B 3 |

B 1 | P 4 | R 4 | R 3 | R 5 | B 6 |

======= Connected in original permutation but not all ======

R 6 | W 2 | P 2 | W 1 | P 1 | W 6 |

B 4 | B 2 | B 1 | G 6 | W 5 | G 1 |

B 5 | Y 2 | Y 3 | W 4 | W 3 | P 5 |

G 2 | P 4 | P 3 | G 5 | R 1 | R 3 |

R 2 | Y 1 | G 4 | Y 6 | B 3 | G 3 |

R 5 | Y 4 | R 4 | P 6 | Y 5 | B 6 |

======= Connected in original permutation but not all ======

W 2 | G 1 | G 5 | W 4 | R 4 | B 3 |

R 5 | G 6 | G 3 | R 3 | B 4 | W 5 |

W 1 | R 6 | B 1 | W 3 | P 1 | P 3 |

B 5 | G 4 | Y 4 | P 5 | Y 2 | G 2 |

B 2 | Y 6 | R 1 | P 4 | Y 1 | B 6 |

Y 5 | W 6 | R 2 | P 2 | Y 3 | P 6 |

======= Connected in original permutation but not all ======

B 5 | G 1 | R 6 | G 3 | W 2 | G 6 |

G 4 | W 3 | P 2 | Y 1 | G 2 | G 5 |

R 4 | B 3 | R 3 | Y 3 | R 1 | Y 5 |

W 5 | R 2 | R 5 | W 4 | W 1 | P 6 |

Y 4 | P 3 | W 6 | B 6 | B 2 | P 4 |

P 5 | P 1 | Y 2 | B 4 | B 1 | Y 6 |

 =======   Connected in original permutation but not all   =======

B 4 | R 5 | P 3 | R 4 | Y 1 | B 1 |

G 5 | P 5 | R 2 | B 2 | B 6 | G 6 |

W 2 | R 6 | P 2 | Y 4 | W 3 | G 4 |

W 5 | P 1 | B 5 | Y 6 | P 6 | G 3 |

Y 3 | W 4 | B 3 | Y 5 | G 2 | Y 2 |

W 1 | P 4 | R 1 | R 3 | W 6 | G 1 |

 =======   Connected in original permutation but not all   =======

G 2 | G 3 | B 5 | R 3 | Y 6 | B 2 |

P 2 | R 5 | R 4 | R 2 | Y 2 | R 6 |

G 6 | P 5 | W 6 | Y 3 | B 6 | R 1 |

G 5 | W 3 | W 1 | Y 5 | Y 1 | P 1 |

W 5 | G 4 | P 6 | B 3 | B 1 | W 4 |

Y 4 | G 1 | P 3 | W 2 | P 4 | B 4 |

 =======   Connected in original permutation but not all   =======

W 5 | G 4 | P 2 | P 1 | G 3 | R 5 |

Y 4 | B 6 | G 2 | P 4 | G 5 | R 3 |

B 5 | W 2 | R 2 | P 5 | Y 1 | P 3 |

Y 6 | B 1 | R 6 | Y 5 | B 4 | W 1 |

G 1 | G 6 | R 1 | R 4 | W 4 | B 3 |

P 6 | B 2 | W 6 | W 3 | Y 3 | Y 2 |

 =======   Connected in original permutation but not all   =======

Y 1 | B 6 | W 1 | G 1 | Y 6 | R 1 |

B 2 | Y 2 | P 4 | B 4 | Y 5 | P 1 |

G 5 | R 2 | P 3 | R 4 | Y 4 | R 3 |

G 4 | P 2 | Y 3 | W 6 | G 3 | P 6 |

R 6 | G 6 | R 5 | G 2 | W 4 | B 5 |

W 3 | B 3 | P 5 | B 1 | W 5 | W 2 |

======= Connected in original permutation but not all ======

P 2 | P 6 | P 5 | G 2 | R 3 | P 1 |

G 4 | G 3 | G 6 | R 1 | B 6 | P 4 |

G 5 | G 1 | R 5 | B 3 | P 3 | B 5 |

R 6 | B 1 | B 4 | Y 4 | Y 1 | Y 5 |

W 3 | B 2 | Y 3 | W 4 | R 4 | W 6 |

R 2 | Y 2 | Y 6 | W 1 | W 2 | W 5 |

======= Connected in original permutation but not all ======

R 1 | R 5 | P 5 | R 4 | G 3 | B 2 |

W 5 | R 2 | R 6 | B 5 | P 3 | Y 6 |

B 6 | W 4 | R 3 | B 3 | W 1 | B 1 |

B 4 | G 2 | Y 5 | W 2 | G 4 | P 1 |

G 5 | W 6 | Y 1 | P 6 | Y 2 | G 6 |

Y 3 | G 1 | W 3 | Y 4 | P 4 | P 2 |

======= Connected in original permutation but not all ======

P 3 | P 5 | P 6 | W 1 | W 6 | Y 4 |

B 4 | Y 5 | Y 2 | B 5 | B 3 | Y 6 |

R 5 | W 5 | W 4 | Y 1 | W 3 | R 6 |

R 2 | W 2 | Y 3 | P 2 | B 1 | B 2 |

P 4 | R 4 | B 6 | G 2 | G 5 | G 3 |

R 3 | R 1 | P 1 | G 4 | G 6 | G 1 |

======= Connected in original permutation but not all ======

G 4 | Y 3 | W 3 | R 3 | G 1 | B 2 |

G 6 | B 4 | R 4 | P 3 | W 1 | P 2 |

P 1 | B 3 | Y 6 | P 4 | Y 1 | B 6 |

R 1 | G 3 | G 5 | Y 4 | P 6 | Y 5 |

G 2 | W 4 | B 5 | P 5 | W 5 | R 2 |

W 6 | B 1 | Y 2 | R 5 | R 6 | W 2 |

   =======   Connected in original permutation but not all   =======

B 5 | G 2 | G 6 | Y 6 | G 1 | Y 2 |

R 2 | G 5 | G 4 | R 1 | P 2 | P 5 |

W 6 | P 4 | R 3 | G 3 | W 5 | W 1 |

W 4 | R 6 | B 4 | P 3 | Y 3 | B 1 |

R 5 | R 4 | Y 4 | P 1 | B 2 | B 6 |

Y 5 | B 3 | W 2 | P 6 | W 3 | Y 1 |

   =======   Connected in original permutation but not all   =======

W 2 | G 1 | Y 4 | W 4 | B 1 | G 5 |

P 5 | W 1 | P 6 | B 2 | G 3 | G 6 |

P 3 | B 4 | B 3 | P 2 | R 1 | P 4 |

G 4 | R 3 | W 5 | B 5 | R 4 | Y 5 |

R 6 | R 2 | G 2 | Y 1 | W 6 | R 5 |

W 3 | P 1 | B 6 | Y 3 | Y 2 | Y 6 |

   =======   Connected in original permutation but not all   =======

Y 4 | B 5 | B 6 | P 1 | W 4 | R 5 |

R 6 | G 3 | P 4 | W 6 | B 3 | W 5 |

Y 5 | R 4 | B 4 | Y 1 | G 1 | R 3 |

G 2 | B 2 | G 6 | P 3 | W 3 | P 2 |

B 1 | G 5 | R 1 | R 2 | Y 6 | W 2 |

G 4 | P 6 | P 5 | W 1 | Y 3 | Y 2 |

   =======   Connected in original permutation but not all   =======

G 3 | W 1 | W 3 | Y 5 | B 2 | Y 2 |

B 5 | R 6 | B 1 | G 1 | Y 1 | R 5 |

G 2 | B 6 | G 4 | B 3 | W 6 | Y 3 |

Y 4 | P 3 | W 4 | R 3 | R 4 | G 5 |

W 2 | G 6 | W 5 | P 4 | R 2 | B 4 |

```
Y 6 | P 1 | R 1 | P 2 | P 6 | P 5 |

   =======   Connected in original permutation but not all    =======

B 5 | R 3 | Y 4 | P 6 | W 3 | W 5 |

Y 1 | R 6 | G 1 | Y 2 | Y 5 | B 3 |

B 4 | W 1 | W 2 | R 1 | G 3 | Y 3 |

B 2 | W 6 | G 2 | P 2 | B 6 | G 5 |

G 4 | Y 6 | W 4 | B 1 | P 4 | P 3 |

R 5 | P 5 | R 4 | G 6 | R 2 | P 1 |

   =======   Connected in original permutation but not all    =======

W 5 | P 1 | B 3 | G 2 | Y 5 | P 2 |

W 1 | B 2 | B 1 | W 2 | G 3 | G 1 |

W 3 | B 5 | Y 1 | W 4 | G 6 | W 6 |

R 6 | P 4 | Y 4 | P 3 | B 6 | P 6 |

Y 2 | B 4 | G 5 | Y 6 | R 4 | Y 3 |

P 5 | R 5 | G 4 | R 2 | R 1 | R 3 |

   =======   Connected in original permutation but not all    =======

R 1 | G 1 | G 3 | G 5 | Y 3 | W 2 |

P 6 | R 3 | R 6 | P 1 | W 1 | W 5 |

W 3 | B 1 | B 5 | W 4 | Y 6 | G 4 |

W 6 | R 2 | P 3 | G 6 | G 2 | Y 4 |

P 2 | Y 5 | R 4 | Y 1 | B 2 | Y 2 |

P 4 | R 5 | P 5 | B 6 | B 4 | B 3 |

   =======   Connected in original permutation but not all    =======

B 4 | G 5 | G 3 | W 4 | W 3 | B 1 |

P 5 | G 6 | W 6 | B 6 | B 3 | R 5 |

Y 2 | P 3 | R 3 | W 2 | G 4 | R 4 |

W 1 | P 4 | Y 3 | P 6 | B 2 | G 1 |

R 2 | P 2 | G 2 | B 5 | W 5 | P 1 |
```

```
R 6 | Y 5 | R 1 | Y 1 | Y 4 | Y 6 |

  =======   Connected in original permutation but not all   =======

W 4 | G 3 | R 3 | R 4 | G 5 | G 6 |

G 1 | B 5 | Y 1 | B 2 | R 5 | R 2 |

R 1 | R 6 | W 1 | G 2 | P 1 | W 2 |

W 5 | G 4 | W 6 | Y 6 | W 3 | B 3 |

B 4 | P 4 | Y 5 | P 2 | B 6 | Y 2 |

P 6 | B 1 | Y 3 | P 3 | P 5 | Y 4 |

  =======   Connected in original permutation but not all   =======

P 1 | R 1 | W 5 | W 2 | W 6 | R 2 |

P 4 | R 6 | R 3 | W 3 | W 1 | R 4 |

R 5 | P 5 | Y 3 | P 3 | B 3 | W 4 |

P 6 | P 2 | Y 6 | Y 1 | G 4 | B 6 |

B 1 | G 6 | Y 4 | G 5 | G 3 | B 4 |

B 2 | G 1 | B 5 | G 2 | Y 5 | Y 2 |

  =======   Connected in original permutation but not all   =======

P 3 | P 6 | P 1 | G 1 | B 3 | P 5 |

B 4 | W 6 | B 2 | B 6 | P 2 | B 5 |

P 4 | W 4 | B 1 | R 1 | R 4 | R 3 |

W 1 | W 5 | W 3 | G 2 | Y 2 | Y 3 |

R 2 | G 3 | W 2 | G 5 | Y 1 | Y 4 |

R 5 | Y 6 | R 6 | G 6 | Y 5 | G 4 |

  =======   Connected in original permutation but not all   =======

G 4 | P 6 | P 3 | W 2 | B 2 | R 6 |

G 3 | R 5 | Y 6 | W 3 | R 3 | W 4 |

W 5 | B 6 | P 1 | G 5 | G 1 | P 4 |

G 2 | R 1 | B 1 | R 2 | Y 5 | B 4 |

W 1 | P 2 | Y 4 | W 6 | Y 2 | B 5 |

B 3 | G 6 | P 5 | Y 3 | Y 1 | R 4 |
```

======= Connected in original permutation but not all   =======

P 3 | B 3 | G 1 | P 2 | G 4 | R 4 |

Y 2 | R 1 | B 2 | P 6 | P 1 | R 3 |

P 4 | P 5 | R 2 | B 1 | Y 3 | Y 4 |

R 6 | W 1 | G 6 | G 2 | W 5 | Y 5 |

B 4 | R 5 | G 5 | W 4 | Y 1 | W 3 |

W 2 | B 6 | W 6 | B 5 | G 3 | Y 6 |

======= Connected in original permutation but not all   =======

W 3 | B 1 | G 2 | W 2 | B 3 | G 6 |

G 5 | B 2 | W 4 | Y 2 | P 2 | W 6 |

B 5 | B 4 | W 5 | W 1 | R 5 | B 6 |

R 1 | P 6 | G 4 | P 4 | P 1 | Y 4 |

P 3 | R 2 | P 5 | R 3 | R 4 | Y 3 |

G 3 | R 6 | G 1 | Y 6 | Y 1 | Y 5 |

======= Connected in original permutation but not all   =======

Y 2 | P 4 | R 2 | G 1 | W 1 | Y 6 |

G 3 | P 5 | B 1 | W 2 | B 5 | P 2 |

R 5 | Y 3 | G 2 | R 4 | R 1 | Y 5 |

G 4 | G 5 | B 3 | R 3 | W 3 | P 1 |

G 6 | Y 4 | R 6 | B 6 | Y 1 | P 3 |

P 6 | B 4 | B 2 | W 5 | W 4 | W 6 |

======= Connected in original permutation but not all   =======

Y 3 | G 3 | G 1 | P 2 | R 6 | R 2 |

B 1 | P 1 | Y 5 | G 5 | Y 1 | W 5 |

W 3 | G 2 | W 2 | Y 6 | B 4 | Y 4 |

G 4 | B 2 | R 1 | R 3 | R 5 | B 5 |

P 4 | B 6 | W 4 | P 3 | Y 2 | W 6 |

W 1 | P 5 | R 4 | G 6 | P 6 | B 3 |

```
           =======    Connected in original permutation but not all    =======

     Y 6 | W 3 | W 6 | P 2 | B 1 | R 4 |

     Y 5 | P 1 | W 4 | Y 4 | B 5 | W 5 |

     P 5 | P 6 | R 5 | B 4 | B 6 | P 4 |

     B 2 | G 3 | B 3 | R 1 | W 1 | R 3 |

     Y 3 | P 3 | G 6 | R 2 | R 6 | G 5 |

     Y 2 | Y 1 | W 2 | G 2 | G 4 | G 1 |

           =======    Connected in original permutation but not all    =======

     B 2 | R 6 | G 4 | Y 6 | Y 2 | P 1 |

     R 5 | P 2 | P 6 | R 4 | G 5 | B 4 |

     G 2 | B 6 | G 3 | R 1 | R 3 | R 2 |

     G 6 | B 5 | W 6 | W 2 | W 5 | W 1 |

     Y 1 | P 3 | G 1 | W 4 | Y 4 | B 1 |

     B 3 | P 4 | P 5 | Y 5 | Y 3 | W 3 |

           =======    Connected in original permutation but not all    =======

     R 1 | Y 4 | Y 2 | G 4 | B 3 | G 1 |

     Y 1 | Y 5 | G 2 | Y 6 | W 6 | P 1 |

     B 2 | G 5 | B 1 | Y 3 | P 4 | W 4 |

     R 2 | R 5 | W 2 | P 3 | B 5 | B 6 |

     P 2 | P 6 | B 4 | W 3 | G 3 | G 6 |

     R 3 | P 5 | R 4 | R 6 | W 5 | W 1 |

           =======    Connected in original permutation but not all    =======

     G 4 | G 3 | W 1 | Y 2 | G 5 | Y 4 |

     W 6 | R 6 | B 1 | G 2 | R 1 | B 4 |

     W 5 | B 5 | P 5 | B 3 | W 4 | B 6 |

     B 2 | G 6 | P 4 | Y 3 | R 4 | P 2 |

     W 2 | R 2 | P 1 | Y 5 | P 6 | R 5 |

     Y 6 | G 1 | R 3 | W 3 | Y 1 | P 3 |

           =======    Connected in original permutation but not all    =======
```

P 3 | B 1 | W 4 | G 4 | R 1 | W 2 |

G 3 | R 3 | R 4 | W 6 | G 2 | W 3 |

R 5 | P 2 | P 5 | G 1 | W 5 | W 1 |

B 6 | P 1 | B 2 | P 6 | R 2 | Y 4 |

P 4 | Y 1 | R 6 | Y 2 | B 4 | G 6 |

Y 3 | B 5 | B 3 | G 5 | Y 6 | Y 5 |

======= Connected in original permutation but not all ======

G 6 | G 1 | P 5 | Y 3 | G 3 | Y 5 |

R 3 | R 5 | R 6 | B 3 | G 5 | P 3 |

R 2 | B 4 | P 6 | G 2 | W 4 | P 1 |

W 3 | W 6 | B 2 | B 6 | R 1 | R 4 |

G 4 | Y 2 | P 2 | Y 4 | W 1 | B 5 |

Y 6 | P 4 | B 1 | W 2 | Y 1 | W 5 |

======= Connected in original permutation but not all ======

P 6 | R 6 | P 3 | Y 5 | G 4 | B 5 |

Y 3 | R 4 | W 5 | G 1 | W 4 | R 5 |

W 3 | G 6 | R 3 | G 3 | P 2 | R 1 |

Y 1 | R 2 | P 4 | B 1 | Y 2 | G 5 |

G 2 | B 2 | Y 4 | W 2 | P 1 | P 5 |

Y 6 | B 3 | B 4 | W 6 | W 1 | B 6 |

======= Connected in original permutation but not all ======

W 6 | B 1 | P 1 | W 3 | W 4 | W 1 |

P 6 | B 3 | W 5 | B 4 | R 1 | P 5 |

P 4 | G 1 | G 4 | B 2 | B 6 | R 5 |

B 5 | W 2 | Y 2 | R 3 | Y 4 | G 5 |

P 2 | R 6 | P 3 | Y 6 | Y 1 | G 6 |

R 2 | R 4 | G 3 | G 2 | Y 5 | Y 3 |

======= Connected in original permutation but not all ======

```
B 6 | W 3 | R 4 | W 1 | G 5 | Y 6 |

G 4 | G 3 | B 2 | R 1 | P 5 | W 2 |

P 4 | W 6 | W 5 | R 5 | G 2 | G 6 |

P 2 | R 6 | Y 4 | B 3 | B 5 | R 3 |

W 4 | G 1 | B 4 | R 2 | Y 2 | P 3 |

P 6 | Y 1 | Y 3 | Y 5 | B 1 | P 1 |

   =======   Connected in original permutation but not all   =======

G 6 | G 3 | P 6 | G 5 | B 5 | R 6 |

P 2 | W 6 | P 5 | R 3 | G 1 | G 2 |

B 1 | B 2 | G 4 | R 2 | Y 4 | P 4 |

W 1 | W 4 | R 4 | Y 5 | P 1 | P 3 |

W 3 | B 6 | W 5 | W 2 | R 1 | Y 6 |

B 3 | B 4 | Y 2 | Y 3 | R 5 | Y 1 |

   =======   Connected in original permutation but not all   =======

Y 6 | Y 2 | R 5 | B 1 | B 5 | B 6 |

G 6 | G 1 | R 2 | B 4 | B 3 | Y 1 |

Y 4 | P 6 | G 2 | W 4 | P 1 | Y 5 |

G 4 | R 3 | P 2 | R 4 | P 3 | B 2 |

G 5 | Y 3 | W 5 | P 4 | R 1 | W 2 |

P 5 | G 3 | R 6 | W 1 | W 3 | W 6 |

   =======   Connected in original permutation but not all   =======

B 2 | G 5 | Y 1 | Y 4 | B 3 | B 1 |

G 3 | B 4 | P 4 | Y 2 | R 2 | R 5 |

P 6 | B 5 | Y 6 | P 1 | Y 3 | P 2 |

W 6 | W 5 | B 6 | R 6 | R 4 | R 3 |

G 4 | Y 5 | W 2 | W 4 | W 3 | W 1 |

P 5 | P 3 | G 6 | G 2 | R 1 | G 1 |

   =======   Connected in original permutation but not all   =======

Y 5 | G 3 | B 1 | P 1 | P 4 | G 4 |
```

```
Y 4 | Y 1 | R 5 | P 6 | Y 2 | G 2 |

P 3 | P 5 | P 2 | B 3 | B 6 | R 1 |

R 6 | Y 3 | W 2 | R 3 | W 1 | Y 6 |

W 4 | B 4 | G 5 | G 6 | W 6 | R 2 |

R 4 | B 5 | B 2 | G 1 | W 3 | W 5 |

  ======= Connected in original permutation but not all  =======

W 2 | W 4 | Y 6 | R 3 | Y 3 | R 5 |

G 5 | Y 5 | B 4 | G 3 | R 2 | B 3 |

R 6 | R 1 | G 6 | Y 4 | G 2 | R 4 |

G 1 | P 4 | P 5 | B 5 | B 2 | W 3 |

G 4 | P 6 | W 1 | B 6 | B 1 | P 3 |

P 1 | P 2 | W 6 | W 5 | Y 1 | Y 2 |

  ======= Connected in original permutation but not all  =======

G 5 | P 4 | W 3 | Y 2 | P 5 | R 4 |

P 1 | P 6 | Y 6 | Y 3 | P 2 | Y 4 |

B 4 | R 2 | Y 1 | P 3 | W 4 | Y 5 |

B 2 | R 3 | W 5 | G 6 | R 5 | W 6 |

B 5 | G 2 | B 3 | R 6 | R 1 | G 3 |

G 1 | B 1 | G 4 | B 6 | W 2 | W 1 |

  ======= Connected in original permutation but not all  =======

B 2 | R 1 | P 6 | R 6 | R 2 | B 1 |

B 3 | Y 2 | P 5 | B 6 | Y 1 | B 4 |

Y 5 | P 1 | Y 6 | R 4 | P 3 | P 4 |

P 2 | Y 4 | R 3 | W 4 | G 2 | Y 3 |

G 1 | W 5 | B 5 | W 2 | W 6 | G 4 |

R 5 | W 3 | G 5 | G 6 | W 1 | G 3 |

  ======= Connected in original permutation but not all  =======

G 4 | R 3 | G 6 | W 3 | B 4 | B 2 |
```

```
Y 1 | P 6 | Y 6 | B 1 | Y 2 | G 5 |

W 6 | W 2 | B 5 | Y 4 | R 4 | Y 3 |

W 1 | R 2 | P 4 | P 5 | G 2 | W 5 |

Y 5 | P 1 | B 6 | W 4 | G 1 | G 3 |

B 3 | P 2 | P 3 | R 5 | R 6 | R 1 |
```

=======   Connected in original permutation but not all   =======

```
R 3 | G 5 | G 1 | B 6 | W 3 | W 6 |

P 5 | P 1 | B 4 | R 2 | Y 5 | R 6 |

W 1 | G 3 | W 2 | R 1 | G 6 | Y 3 |

Y 1 | R 5 | W 4 | P 6 | B 3 | Y 6 |

G 4 | R 4 | B 2 | P 3 | Y 2 | G 2 |

B 5 | W 5 | B 1 | Y 4 | P 2 | P 4 |
```

=======   Connected in original permutation but not all   =======

```
B 5 | R 1 | W 6 | W 2 | G 5 | W 5 |

Y 6 | W 3 | P 1 | W 1 | Y 4 | B 6 |

G 6 | Y 1 | W 4 | B 4 | P 5 | G 1 |

B 2 | Y 2 | Y 3 | R 3 | G 4 | P 3 |

G 2 | P 4 | Y 5 | R 2 | R 4 | R 5 |

B 1 | B 3 | G 3 | P 6 | P 2 | R 6 |
```

=======   Connected in original permutation but not all   =======

```
W 1 | B 4 | Y 2 | R 1 | R 3 | W 2 |

Y 5 | B 5 | G 3 | B 3 | G 4 | B 2 |

P 3 | Y 3 | G 1 | P 6 | Y 6 | R 6 |

B 1 | G 6 | Y 1 | R 2 | W 3 | G 2 |

B 6 | W 5 | W 4 | G 5 | P 5 | W 6 |

Y 4 | R 4 | R 5 | P 2 | P 1 | P 4 |
```

=======   Connected in original permutation but not all   =======

```
P 6 | Y 6 | W 4 | B 4 | Y 1 | P 5 |

R 3 | B 1 | Y 2 | G 1 | P 3 | G 6 |
```

```
B 2 | G 3 | B 5 | P 1 | G 4 | G 5 |

B 3 | W 2 | W 3 | G 2 | Y 3 | W 6 |

R 5 | B 6 | Y 4 | P 4 | R 4 | W 1 |

Y 5 | P 2 | R 2 | R 6 | R 1 | W 5 |

   =======   Connected in original permutation but not all    =======

W 2 | W 3 | Y 2 | G 2 | P 3 | B 5 |

W 6 | B 2 | W 5 | Y 1 | B 4 | R 2 |

W 1 | W 4 | B 1 | R 1 | P 4 | G 5 |

B 6 | B 3 | P 6 | Y 4 | Y 3 | Y 6 |

P 5 | P 2 | R 3 | G 1 | R 5 | Y 5 |

R 4 | G 6 | R 6 | G 3 | P 1 | G 4 |

   =======   Connected in original permutation but not all    =======

W 6 | W 2 | G 3 | W 5 | G 5 | Y 3 |

P 4 | B 2 | G 6 | W 1 | P 6 | R 6 |

G 4 | R 5 | P 5 | P 2 | P 1 | P 3 |

B 6 | B 3 | Y 1 | B 4 | B 5 | B 1 |

G 2 | G 1 | Y 6 | W 4 | Y 2 | R 1 |

R 3 | W 3 | Y 5 | Y 4 | R 2 | R 4 |

   =======   Connected in original permutation but not all    =======

Y 4 | Y 5 | R 2 | W 6 | W 1 | R 6 |

Y 2 | P 4 | G 5 | P 1 | G 3 | Y 3 |

Y 1 | G 2 | P 3 | P 2 | B 5 | R 4 |

G 4 | Y 6 | W 5 | R 1 | B 2 | W 2 |

R 3 | P 5 | G 1 | B 4 | B 3 | B 6 |

W 4 | G 6 | P 6 | B 1 | W 3 | R 5 |

   =======   Connected in original permutation but not all    =======

Y 2 | P 4 | P 1 | P 6 | W 6 | Y 6 |

G 3 | R 5 | Y 4 | G 4 | W 3 | Y 5 |
```

```
P 5 | G 5 | P 3 | B 6 | R 4 | Y 3 |

P 2 | B 1 | Y 1 | W 4 | B 2 | G 6 |

G 2 | R 3 | B 3 | R 1 | R 2 | W 5 |

B 5 | B 4 | G 1 | R 6 | W 2 | W 1 |
```

   =======   Connected in original permutation but not all   =======

```
W 3 | R 5 | W 6 | G 1 | B 6 | B 2 |

B 5 | B 3 | B 1 | R 3 | P 3 | B 4 |

G 5 | P 6 | R 6 | P 5 | Y 6 | G 6 |

P 4 | R 1 | G 3 | G 2 | W 2 | G 4 |

P 2 | P 1 | W 1 | Y 2 | R 2 | Y 3 |

R 4 | W 4 | W 5 | Y 1 | Y 4 | Y 5 |
```

   =======   Connected in original permutation but not all   =======

```
W 3 | W 5 | W 4 | P 5 | R 4 | B 2 |

R 5 | Y 3 | P 6 | R 1 | G 1 | Y 4 |

Y 6 | W 1 | B 1 | P 3 | R 2 | P 1 |

R 6 | R 3 | P 4 | W 6 | W 2 | B 3 |

G 4 | P 2 | G 2 | B 5 | Y 1 | Y 5 |

G 5 | G 3 | G 6 | B 6 | B 4 | Y 2 |
```

   =======   Connected in original permutation but not all   =======

```
R 3 | Y 4 | R 2 | Y 5 | W 1 | P 4 |

G 4 | Y 2 | W 3 | B 3 | W 6 | G 3 |

Y 1 | R 4 | P 3 | Y 6 | G 2 | P 5 |

P 2 | Y 3 | B 1 | W 2 | W 5 | P 6 |

R 5 | B 2 | R 6 | B 4 | B 6 | B 5 |

W 4 | G 5 | P 1 | R 1 | G 6 | G 1 |
```

   =======   Connected in original permutation but not all   =======

```
R 1 | Y 1 | Y 5 | G 5 | B 3 | R 3 |

Y 2 | G 3 | P 4 | P 6 | R 5 | R 6 |

P 2 | W 4 | B 5 | Y 6 | Y 3 | P 5 |
```

```
W 5 | W 2 | P 1 | B 1 | W 1 | Y 4 |

R 2 | B 2 | G 1 | B 6 | W 3 | B 4 |

P 3 | G 2 | R 4 | G 6 | G 4 | W 6 |

   =======   Connected in original permutation but not all   =======

B 3 | R 3 | W 2 | G 3 | G 5 | P 1 |

W 6 | P 4 | R 6 | B 4 | R 1 | Y 1 |

Y 2 | B 6 | P 2 | B 1 | P 6 | P 3 |

G 4 | B 2 | P 5 | W 5 | G 6 | W 3 |

B 5 | W 1 | Y 5 | G 1 | R 2 | Y 3 |

W 4 | R 4 | G 2 | Y 6 | Y 4 | R 5 |

   =======   Connected in original permutation but not all   =======

B 2 | Y 6 | R 3 | B 3 | R 2 | R 5 |

P 1 | G 3 | G 2 | G 4 | P 6 | P 5 |

W 5 | G 6 | R 1 | P 3 | G 5 | B 5 |

R 4 | Y 5 | B 6 | Y 1 | W 1 | P 2 |

Y 4 | G 1 | B 1 | Y 3 | P 4 | W 2 |

Y 2 | B 4 | R 6 | W 6 | W 4 | W 3 |

   =======   Connected in original permutation but not all   =======

P 4 | W 5 | Y 2 | R 5 | R 6 | R 3 |

W 2 | G 2 | G 4 | P 6 | B 3 | B 6 |

R 4 | W 4 | Y 6 | W 3 | Y 4 | R 1 |

B 5 | G 3 | G 5 | Y 1 | P 1 | Y 5 |

P 3 | B 1 | W 6 | Y 3 | W 1 | G 1 |

R 2 | P 2 | P 5 | G 6 | B 4 | B 2 |

   =======   Connected in original permutation but not all   =======

G 5 | B 6 | R 5 | W 3 | W 6 | P 5 |

R 1 | G 6 | R 4 | G 1 | B 1 | B 4 |

R 2 | R 6 | Y 5 | G 4 | R 3 | P 6 |
```

```
W 2 | Y 6 | W 5 | W 1 | B 2 | P 2 |

Y 4 | Y 2 | G 2 | W 4 | B 3 | P 3 |

G 3 | Y 3 | P 1 | P 4 | Y 1 | B 5 |

   =======   Connected in original permutation but not all   =======

B 2 | R 3 | G 4 | Y 4 | B 4 | Y 2 |

G 6 | G 3 | G 5 | P 3 | R 2 | Y 6 |

B 6 | Y 5 | P 6 | Y 3 | P 1 | Y 1 |

R 4 | B 5 | P 4 | W 3 | P 5 | G 1 |

R 6 | R 5 | R 1 | B 1 | W 6 | W 5 |

G 2 | B 3 | W 4 | W 1 | W 2 | P 2 |

   =======   Connected in original permutation but not all   =======

G 4 | B 6 | Y 3 | G 2 | B 1 | W 1 |

Y 1 | B 4 | P 3 | R 1 | P 1 | B 2 |

P 4 | G 1 | Y 6 | W 2 | W 3 | B 5 |

W 5 | P 6 | W 4 | R 3 | G 3 | R 6 |

R 5 | R 2 | B 3 | R 4 | Y 5 | Y 4 |

W 6 | G 6 | G 5 | P 2 | Y 2 | P 5 |

   =======   Connected in original permutation but not all   =======

W 3 | W 6 | B 6 | G 6 | R 6 | R 3 |

G 5 | W 4 | B 4 | P 1 | G 3 | P 3 |

G 4 | P 2 | W 2 | P 6 | W 5 | R 4 |

G 1 | B 2 | W 1 | B 3 | R 5 | P 5 |

G 2 | B 5 | R 1 | P 4 | Y 2 | Y 3 |

R 2 | Y 1 | B 1 | Y 6 | Y 5 | Y 4 |

   =======   Connected in original permutation but not all   =======

G 3 | W 5 | W 1 | P 3 | G 2 | B 4 |

Y 6 | Y 4 | P 1 | G 5 | Y 2 | B 2 |

R 2 | P 4 | Y 3 | R 3 | P 2 | W 4 |

G 6 | G 4 | Y 1 | P 5 | R 4 | W 3 |
```

```
B 3 | W 2 | Y 5 | W 6 | B 6 | R 1 |

P 6 | R 6 | R 5 | B 1 | B 5 | G 1 |
```

   =======   Connected in original permutation but not all   =======

```
Y 1 | G 3 | G 4 | W 3 | Y 3 | Y 4 |

R 5 | B 2 | P 3 | W 1 | Y 6 | P 2 |

P 1 | W 6 | R 1 | P 5 | G 2 | W 4 |

W 5 | B 1 | R 4 | B 3 | Y 2 | W 2 |

G 6 | R 2 | R 6 | R 3 | Y 5 | G 1 |

P 4 | P 6 | G 5 | B 6 | B 4 | B 5 |
```

   =======   Connected in original permutation but not all   =======

```
B 5 | B 3 | B 2 | Y 1 | Y 2 | Y 5 |

R 6 | R 1 | R 3 | W 6 | P 2 | W 3 |

B 4 | W 1 | B 6 | P 3 | G 1 | Y 4 |

B 1 | G 6 | G 2 | G 3 | P 4 | Y 3 |

R 2 | G 4 | G 5 | Y 6 | P 5 | R 5 |

W 5 | W 2 | W 4 | R 4 | P 1 | P 6 |
```

   =======   Connected in original permutation but not all   =======

```
Y 5 | Y 4 | P 3 | W 1 | P 4 | W 4 |

R 6 | P 5 | Y 6 | P 2 | B 5 | W 2 |

P 1 | R 2 | P 6 | Y 3 | G 1 | G 5 |

W 6 | R 5 | B 1 | W 5 | Y 2 | B 4 |

G 6 | Y 1 | R 4 | G 3 | G 2 | R 1 |

B 3 | G 4 | W 3 | B 2 | R 3 | B 6 |
```

   =======   Connected in original permutation but not all   =======

```
W 3 | G 5 | W 6 | G 3 | W 1 | G 4 |

G 2 | B 6 | R 4 | G 1 | P 2 | B 5 |

Y 4 | P 1 | P 4 | G 6 | P 5 | R 5 |

R 6 | B 4 | W 2 | P 3 | R 1 | B 2 |
```

```
R 2 | Y 1 | Y 2 | W 5 | W 4 | B 1 |

P 6 | B 3 | Y 3 | R 3 | Y 6 | Y 5 |

  =======   Connected in original permutation but not all   =======

W 1 | Y 5 | G 3 | B 1 | R 5 | G 5 |

B 5 | G 4 | P 4 | Y 3 | P 5 | B 3 |

W 3 | G 2 | W 5 | R 3 | P 3 | P 6 |

R 2 | P 2 | R 1 | R 6 | G 1 | B 6 |

Y 2 | Y 6 | B 4 | R 4 | W 4 | B 2 |

P 1 | Y 4 | G 6 | W 6 | W 2 | Y 1 |

  =======   Connected in original permutation but not all   =======

W 5 | G 5 | W 2 | W 4 | W 3 | P 4 |

G 1 | P 6 | B 1 | B 3 | P 1 | W 1 |

W 6 | Y 3 | Y 4 | P 5 | R 6 | R 1 |

G 2 | G 6 | Y 1 | Y 5 | Y 2 | B 6 |

P 3 | P 2 | G 4 | R 4 | B 4 | R 5 |

G 3 | Y 6 | R 2 | R 3 | B 2 | B 5 |

  =======   Connected in original permutation but not all   =======

B 3 | P 5 | W 6 | G 6 | G 1 | Y 1 |

R 1 | G 5 | P 1 | P 3 | Y 4 | P 2 |

P 4 | B 2 | G 4 | P 6 | G 3 | R 3 |

B 4 | G 2 | B 1 | W 3 | Y 3 | R 4 |

R 2 | Y 2 | W 5 | B 6 | R 6 | B 5 |

W 2 | Y 5 | R 5 | Y 6 | W 1 | W 4 |

  =======   Connected in original permutation but not all   =======

P 1 | P 6 | P 4 | W 1 | P 3 | B 5 |

G 3 | W 2 | R 3 | G 4 | G 6 | W 3 |

G 1 | Y 2 | W 5 | P 2 | G 5 | B 1 |

R 4 | R 2 | B 6 | B 2 | B 4 | R 6 |

B 3 | G 2 | P 5 | W 6 | R 5 | Y 5 |
```

R 1 | W 4 | Y 1 | Y 3 | Y 4 | Y 6 |

  =======   Connected in original permutation but not all   =======

W 4 | W 3 | P 3 | P 6 | P 2 | B 1 |

Y 2 | W 5 | B 5 | Y 1 | P 4 | Y 3 |

B 6 | Y 5 | P 1 | B 4 | W 2 | Y 6 |

G 4 | W 6 | W 1 | R 6 | G 3 | G 1 |

Y 4 | P 5 | G 6 | G 2 | R 4 | G 5 |

B 3 | R 2 | R 1 | B 2 | R 5 | R 3 |

  =======   Connected in original permutation but not all   =======

Y 6 | P 3 | R 5 | B 4 | B 3 | G 4 |

Y 5 | Y 4 | G 6 | R 4 | B 2 | B 6 |

W 5 | R 3 | R 6 | B 1 | R 2 | G 3 |

G 1 | W 1 | W 3 | Y 3 | W 2 | W 4 |

W 6 | B 5 | P 5 | Y 1 | G 5 | P 4 |

R 1 | P 1 | Y 2 | P 2 | P 6 | G 2 |

  =======   Connected in original permutation but not all   =======

B 1 | R 1 | P 5 | R 3 | P 4 | Y 6 |

G 5 | G 3 | G 1 | B 6 | Y 5 | G 4 |

B 3 | G 6 | W 3 | W 5 | B 4 | R 4 |

R 5 | B 2 | Y 1 | Y 2 | B 5 | Y 3 |

G 2 | P 1 | Y 4 | P 3 | W 1 | R 2 |

W 4 | P 2 | P 6 | R 6 | W 6 | W 2 |

  =======   Connected in original permutation but not all   =======

B 3 | Y 1 | R 5 | W 1 | P 5 | B 4 |

B 2 | P 6 | P 4 | W 4 | Y 2 | G 4 |

R 6 | B 5 | R 2 | P 3 | R 3 | G 1 |

P 2 | W 6 | W 5 | Y 3 | G 3 | G 6 |

Y 4 | G 5 | G 2 | B 6 | B 1 | Y 6 |

W 3 | W 2 | P 1 | R 1 | Y 5 | R 4 |

I give you tiles for microrobots for n x n microrobots. You chose what n x n microrobots looks like (4 tiles, 3x3 tiles, etc). I ask "is this board fully connected?" Is there a more computationally efficient way to check if fully connected than enumerating all possible permutations and checking connectedness? Can you prove a hardness result for this?

Is this problems Co-NP Hard? should not be NP-Hard

"Fun with Algorithms" https://sites.google.com/view/fun2020/home (https://sites.google.com/view/fun2020/home)

In [ ]: