Connectivity

```
In [18]: class pixel:

             def __init__(self,x,y):
                 self.x = x
                 self.y = y
```

```
In [23]: def four_way_check(p1,p2):

             x1,y1 = p1.x,p1.y
             x2,y2 = p2.x,p2.y

             if x2==x1:
                 if y2-1==y1:
                     return True
                 elif y2+1==y2:
                     return True
             elif y2==y1:
                 if x2-1==x1:
                     return True
                 elif x2+1==x1:
                     return True
             else:
                 return False
```

```
In [29]: def four_way(p1):

             x1,y1 = p1.x,p1.y
             neig_four = [(x1-1,y1),(x1+1,y1),(x1,y1-1),(x1,y1+1)]

             return neig_four
```

```
In [31]: def d_way(p1):
             x1,y1 = p1.x,p1.y
             neig_d = [(x1-1,y1-1),(x1-1,y1+1),(x1+1,y1-1),(x1+1,y1+1)]
             return neig_d
```

```
In [33]: def eight_way(p1):
             x1,y1 = p1.x,p1.y
```

```
            eight = [(x1-1,y1-1),(x1-1,y1),(x1-1,y1+1),(x1,y1-1),(x1,y1+1),(x1+1,y1-1),(x1+1,y1
            return eight
```

```
In [38]: print(four_way(p2))
```

```
[(0, 0), (2, 0), (1, -1), (1, 1)]
```

```
In [39]: print(d_way(p2))
```

```
[(0, -1), (0, 1), (2, -1), (2, 1)]
```

```
In [40]: print(eight_way(p2))
```

```
[(0, -1), (0, 0), (0, 1), (1, -1), (1, 1), (2, -1), (2, 0), (2, 1)]
```

```
In [21]: p1 = pixel(0,0)
         p2 = pixel(1,0)

         print(four_way(p1))
```

```
True
```

```
In [7]: p3 = pixel(1,1)
        print(four_way(p1,p3))
```

```
False
```

```
In [24]: def d_way_check(p1,p2):

             x1,y1 = p1.x,p1.y
             x2,y2 = p2.x,p2.y

             if x2-1==x1 and y2-1==y1:
                 return True
             elif x2-1==x1 and y2+1==y1:
                 return True
             elif x2+1==x1 and y2-1==y1:
                 return True
             elif x2+1==x1 and y2+1==y1:
                 return True
             else:
                 return False
```

```
In [9]: d_way(p1,p2)
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```
Out[9]: False

In [10]: d_way(p1,p3)

Out[10]: True

In [25]: def eight_way_check(p1,p2):

             x1,y1 = p1.x,p1.y
             x2,y2 = p2.x,p2.y

             eight = [(x1-1,y1-1),(x1-1,y1),(x1-1,y1+1),(x1,y1-1),(x1,y1+1),(x1+1,y1-1),(x1+1,y1
             if (x2,y2) in eight:
                 return True
             else:
                 return False



In [12]: eight_way(p1,p2)

Out[12]: True

In [13]: p4 = pixel(2,3)

In [14]: eight_way(p1,p4)

Out[14]: False

In [26]: def m_way_check(p1,p2):
             x1,y1 = p1.x,p1.y
             x2,y2 = p2.x,p2.y

             eight = [(x1-1,y1-1),(x1-1,y1),(x1-1,y1+1),(x1,y1-1),(x1,y1+1),(x1+1,y1-1),(x1+1,y1
             if (x2,y2) in eight:
                 return True
             else:
                 return False

In [16]: m_way(p1,p2)

Out[16]: True

In [17]: m_way(p1,p4)

Out[17]: False

In [ ]:
```