Intelligent Scissors  
Complete Test Cases

# Complete Tests

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| Case | Input Image | Image Width and Height | Output File |
| 1 | Case1/test.jpg | 4272x 2828 | Case1/output.txt |
| 2 | Case2/test.png | 5000x2818 | Case2/output2.txt  Case2/path.txt |

## Cases Output Description

You shall output this information for each case:

1. An output file that contains the construction of the graph
   1. Prompt every index node which represents every pixel in the image (Hint: the index of pixel after converting the image from 2d to 1d).
   2. With the edges from this index node to the surrounding neighbors and the weight for each edge (**Hint : using 4 connectivity**).
2. Another output file that contains the list of pixels that represent the shortest path between the source node and the destination node (**Hint: Saving the node index besides the pixel X’s and Y’s position**).
3. At the end of each output file print the **computational** time in seconds (the time that the operation took in constructing the graph and finding the shortest path). (Hint: You should exclude the I/O time).

**VERY IMPORTANT: Output files are very large to be just opened in Notepad or something similar. They can be opened by an editor that can handle large files (e.g. EmEditor). EmEditor will be found with the testcases materials.**

## Graph Construction Example:

* **Case1/test.jpg**
* **Case1/output.txt** shall contain:
  + **The graph that was constructed from the image.**
  + **Every node index which represents one pixel in the image followed by the edges between it and the neighbors with the weights.**
  + **The computational time at the end of the file.**
  + **Example:**

Constructed Graph: (Format: node\_index|edges:(from, to, weight)(from, to, weight)...)

0|edges:(0,1,1)(0,4272,1)

1|edges:(1,2,1)(1,4273,8.16588936419192E+15)(1,0,1)

2|edges:(2,3,0.5)(2,4274,4.08294468209596E+15)(2,1,1)

3|edges:(3,4,0.333)(3,4275,1)(3,2,0.5)

4|edges:(4,5,0.333)(4,4276,0.5)(4,3,0.333)

5|edges:(5,6,0.5)(5,4277,0.5)(5,4,0.333)

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Graph construction took: 34.9158145 seconds.

## Shortest Path Example:

* **Case2/test.png.**
* **Case2/path.txt** shall contain:
  + **The path from node A to node B**
  + **Every line represents the (x,y) values for each node in the interconnected path edge**
  + **The last line should print the total computational time of the operation**
  + **Example:**  
    The shortest path from node 1695577 at (577, 339) to Node 2055619 at (619, 411)

Format: (node\_index, x, y)

{X=577,Y=339},577,339)

{X=578,Y=339},578,339)

{X=579,Y=339},579,339)

{X=580,Y=339},580,339)

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Path construction took: 1.560917 seconds.