

**Similarity Image Search - Comprehensive  
Assignment:  
Deliverable 2**

**CSI 2120 - Programming Paradigms  
Winter 2024**

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## Functions:

<b>(hist-&gt;list fileName)</b>	Takes in a file (fileName) and returns its contents in a list.
<b>(process-files files)</b>	Reads and processes multiple files (files) in a list of file names, and returns the list of histograms.
<b>(compute-similarity hist1 hist2)</b>	Compares one histogram (hist1) to another (hist2) using the given algorithm and returns the similarity score.
<b>(normalize-histogram histogram)</b>	Normalizes the given histogram (histogram) and returns the normalized histogram as a list.
<b>(normalize-all-histograms files)</b>	Same as <b>normalize-histogram</b> but for all members of a directory (files).
<b>(get-all-files directory)</b>	Given a directory (directory), all files are normalized and a list of pairs containing a filename and the normalized histogram is returned.
<b>(clean-output L)</b>	Displays the 5 most similar images in order and formatted given a list (L).
<b>(similaritySearch queryImageName imageDatasetDirectory)</b>	Given a query (queryImageName), that image will be compared to a directory of images (imageDatasetDirectory) and the 5 most similar images are displayed.

## Outputs:

<b>q0</b>	5 closest images: 1. 1144, Similarity of 1.0 2. 3806, Similarity of 0.7074537037037036 3. 3714, Similarity of 0.668431712962963 4. 3756, Similarity of 0.6620254629629632 5. 2462, Similarity of 0.6491030092592595
<b>q1</b>	5 closest images: 1. 3588, Similarity of 0.5703645833333333 2. 2536, Similarity of 0.5612557870370372 3. 3553, Similarity of 0.5365624999999999 4. 1875, Similarity of 0.5282986111111114 5. 2592, Similarity of 0.5049710648148148
<b>q2</b>	5 closest images: 1. 1091, Similarity of 0.6543518518518517 2. 3005, Similarity of 0.6425925925925927 3. 850, Similarity of 0.629334490740741 4. 3728, Similarity of 0.6242418981481478 5. 1090, Similarity of 0.623582175925926
<b>q3</b>	5 closest images: 1. 1255, Similarity of 0.5487037037037038 2. 3532, Similarity of 0.5420949074074073 3. 4507, Similarity of 0.5384143518518518 4. 692, Similarity of 0.5370486111111109 5. 4737, Similarity of 0.5314583333333331
<b>q4</b>	5 closest images: 1. 1799, Similarity of 0.8465046296296292 2. 848, Similarity of 0.4933969907407408 3. 4261, Similarity of 0.48906828703703703 4. 1800, Similarity of 0.47143518518518523 5. 1937, Similarity of 0.46808449074074077
<b>q5</b>	5 closest images: 1. 2223, Similarity of 0.6143576388888888 2. 3091, Similarity of 0.6001273148148148 3. 2550, Similarity of 0.5303530092592593 4. 2883, Similarity of 0.5288252314814814 5. 2901, Similarity of 0.5229571759259256
<b>q6</b>	5 closest images: 1. 2278, Similarity of 0.775943287037037 2. 2224, Similarity of 0.7166724537037037 3. 1108, Similarity of 0.712679398148148 4. 1917, Similarity of 0.6976967592592592 5. 3806, Similarity of 0.6947453703703703
<b>q7</b>	5 closest images: 1. 2377, Similarity of 0.9999999999999988 2. 2379, Similarity of 0.7670370370370372 3. 2079, Similarity of 0.6396643518518518 4. 1653, Similarity of 0.6341377314814814 5. 1896, Similarity of 0.6221759259259262

<b>q8</b>	5 closest images: 1. 2587, Similarity of 0.7232407407407407 2. 1837, Similarity of 0.7008912037037037 3. 2586, Similarity of 0.6713831018518518 4. 1515, Similarity of 0.6691203703703703 5. 1217, Similarity of 0.6679745370370369
<b>q9</b>	5 closest images: 1. 2839, Similarity of 0.79021412037037 2. 3414, Similarity of 0.5090219907407404 3. 2617, Similarity of 0.45107060185185205 4. 4363, Similarity of 0.42425347222222226 5. 4816, Similarity of 0.3847106481481483
<b>q10</b>	5 closest images: 1. 2976, Similarity of 0.7448495370370373 2. 2971, Similarity of 0.6602488425925924 3. 3108, Similarity of 0.6443113425925925 4. 2194, Similarity of 0.6412557870370371 5. 4118, Similarity of 0.6342650462962964
<b>q11</b>	5 closest images: 1. 3017, Similarity of 0.6110358796296296 2. 3660, Similarity of 0.5757696759259259 3. 2411, Similarity of 0.5699594907407406 4. 1010, Similarity of 0.5557928240740739 5. 2067, Similarity of 0.5535937499999999
<b>q12</b>	5 closest images: 1. 3135, Similarity of 0.9999999999999999 2. 3133, Similarity of 0.6417650462962964 3. 2447, Similarity of 0.5733854166666663 4. 4429, Similarity of 0.5432870370370371 5. 2964, Similarity of 0.512349537037037
<b>q13</b>	5 closest images: 1. 3225, Similarity of 0.9999999999999992 2. 2083, Similarity of 0.49487268518518496 3. 2082, Similarity of 0.494537037037037 4. 2078, Similarity of 0.4889814814814819 5. 2607, Similarity of 0.4723784722222221
<b>q14</b>	5 closest images: 1. 2193, Similarity of 0.4463136574074074 2. 3108, Similarity of 0.3805729166666667 3. 3318, Similarity of 0.3797280092592593 4. 4028, Similarity of 0.3712037037037037 5. 3085, Similarity of 0.3705439814814815
<b>q15</b>	1. 4756, Similarity of 0.7374768518518516 2. 2462, Similarity of 0.7236631944444445 3. 3756, Similarity of 0.6971238425925927 4. 908, Similarity of 0.6936805555555555 5. 3675, Similarity of 0.6923726851851854

## References Cited:

StackOverflow. (2013, July). *Racket: How to retrieve the path of the running file?* [Racket: How to retrieve the path of the running file? - Stack Overflow](#)