Which statement is correct about gamma correction?  
  
Select one:  
a.  
Gamma correction does not change the contrast of the original image if the dynamic range of the image = [0.255]  
  
b.  
Gamma correction is a linear transformation  
  
**c.  
Gamma correction enhances the contrast in the dark areas of the image when the gamma factor is greater than**   
  
d.  
Gamma correction enhances the contrast in the dark areas of the image when the gamma factor is less than 1

# The Hough transform can be used to detect which of the following objects in an image?

Hough transform detect lines

**all answers**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4 | To match two images I1 and I2, we need to compute the local features on the two images and match those two feature sets. What is the purpose of matching these two feature sets?  Select one:  a. Finding the most important points in the two images   b. Finding the pairs of most similar pixels between two images   c. Finding real-world points from the viewing angles of two images   d. Finding the most prominent corner points in the two images | | c | |
| 5 | Suppose an original image and its corresponding spectral image are given below. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 6 | Suppose an original image and its corresponding spectral image are given below. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 7 | Which characteristic does an image with the histogram below have?    Select one:  a. Low luminance   b. High luminance   c. Low contrast   d. High contrast | |  | | | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 8 | The Tversky loss function is based on the following Tversky similarity index TIc: | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 9 | The Tversky loss function is based on the following Tversky similarity index TIc: | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 10 | Consider the pseudocode of the Non-maximum Suppression algorithm for post-processing object detection methods as follows: | | Increase xong reduce | |  | | | |  | | |  | | | | | 29 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 11 | Sobel mask (using derivative mask in the x direction and y direction) gives the worst results for which of the following edges? | | Both horizontal and vertical edges | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 12 | Which statement is correct about gamma correction? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 13 | When using the Bag-of-words method to represent the content of an image, is the spatial information of the local features taken into account? | | No | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 14 | To remove noise after applying background subtraction algorithm, which of the following morphological transformations is the most suitable? | | opening | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 15 | Which characteristic does an image with the histogram below have? | |  | |  | | | |  | | |  | | | | | 12 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 16 | Given a gray scale image I of size M x N. Choose the option to complete the code that calculates a gray level histogram consisting of 256 columns corresponding to gray level values from 0 to 255: | | histogram[I[i][j]] += 1 | |  | | | |  | | |  | | | | | 12 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 17 | The pair of images below depict the result of a morphological transformation. On the left is the input image, on the right is the resulting image of the transformation. What morphological transformation is this? | |  | |  | | | |  | | |  | | | | | 24 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 18 | What are the assumptions made by Lucas-Kanade algorithm for motion estimation? Please choose the correct answers. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 19 | In order to match existing tracklets with bounding boxes of objects detected at a particular frame, what algorithm can we use? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 20 | Object detection techniques in the document recognition task are often used to | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 21 | Drag and drop the words below to fill in the blanks in the following statement: | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 22 | Choose the correct statement about the AdaBoost algorithm: | |  | |  | | | |  | | |  | | | | | 21 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 23 | The vocabulary tree | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 24 | The two pairs of images below depict the performance results of the two filters. Each pair includes the left image as the input image and the right image as the resulting image of the filter processing. What are the filters that correspond to these results? | | Left: gaussian filter; Right: box filter (average filter) | |  | | | |  | | |  | | | | | 33 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 25 | When transforming a noisy image to the frequency domain, where is the component corresponding to the noise observed in the spectrum? | |  | |  | | | |  | | |  | | | | | 22 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 26 | Please select the spectrum amplitude image corresponding to each of the four input images and drag-and-drop it into the corresponding blank box below. | |  | |  | | | |  | | |  | | | | | 17 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 27 | The SIFT feature vector at a feature point is computed in a local area around that feature point. Which parameters of the feature point are used to define this local area? | | dap an dai nhat | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 28 | The Harris method detects corner points based on the analysis of the Hessian matrix of the function representing the change in the values of pixels in a window when the window moves around a point under consideration. What are the criteria to detect a point as a corner? | | both small | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 29 | Which of the following is a limitation of the smoothing filter? | | Blur edges | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 30 | Suppose the YOLOv1 algorithm divides the input image into a grid of size 10\*10. For each cell in the split grid, the network makes 5 predictions (bounding box). The number of object classes in the dataset is 20. The output of the YOLOv1 network will be a three-dimensional H\*W\*C block representing the information of predicted boxes over the entire image prior to the non-maximum suppression step. What is the number of elements of the output block (product of H\*W\*C)? | | 12500 | |  | | | |  | | |  | | | | | 9 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 31 | Median filter is: | | Non-linear filter | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 32 | How to build a vocabulary tree from the space of feature vectors extracted from the training images? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 33 | To match two images I1 and I2, we need to compute the local features on the two images and match those two feature sets. What is the purpose of matching these two feature sets? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 34 | Below are three pairs of images. Each pair includes the left image as the input image and the right image as the resulting image of the filter processing. Drag and drop the most suitable linear filter into the empty box below each pair of corresponding images. | |  | |  | | | |  | | | 28 | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 35 | Suppose we only apply the equation of brightness invariance to a single pixel (regardless of the similar movement of neighboring pixels). Then, in what direction will we can not accurately estimate the motion component? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 36 | What is a neural network architecture used in the semantic segmentation problem? Please select all correct answers. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 37 | In multi-object tracking, a tracklet is used to track a corresponding object. A new tracklet will be spawned when | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 38 | In order to match existing tracklets with bounding boxes of objects detected at a particular frame, what algorithm can we use? | |  | |  | | | |  | | |  | | | | | 7 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 39 | Assuming the state vector of the Kalman filter has 10 elements, the observation vector has 5 elements. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 40 | What are the properties of convolution? Check all that apply. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 41 | Please select the frequency filter corresponding to each of the four output images and drag-and-drop it into the corresponding blank box below. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 42 | Which of the following is NOT a single-stage object detector? | | SSD | |  | | | |  | | |  | | | | | 10 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 43 | Which of the following statements is true about the Canny method? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 44 | The type of motion in the ideal case where the optical flow is the same as the motion field is called | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 45 | An object of the uniform color is captured under varying lighting conditions. Suppose the captured images are represented in Lab color space. Which channel has the strongest variation in value? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 46 | Which of the following statements are correct?If the image does not have salt-and-pepper noise, increasing the median mask size does not affect the results of the median filter. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 47 | When transforming a noisy image to the frequency domain, where is the component corresponding to the noise observed in the spectrum? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 48 | What are the local features used for the Viola-Jones face detector? | | The Viola-Jones face detector uses Haar-like features as the local features for face detection. | | source: tra trên chatgpt, ae có thể double check | | | |  | | |  | | | | | 14 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 49 | An advantage of Haar-like features is: | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 50 | The following graph shows the PR curves of an object detection algorithm with different IOU thresholds of 0.5, 0.6, 0.7, 0.8 and 0.9. What IOU threshold corresponds to the green curve? | |  | |  | | | |  | | |  | | | | | 26 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 51 |  | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 52 |  | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 53 |  | |  | |  | | | | 35 | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 54 |  | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 55 |  | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 56 | Please select all true statements about R-CNN | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 57 | Which of the following algorithms can be used for image segmentation? Choose all the correct answers. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 58 | When performing high-pass filtering with cutoff frequency (fc) in the frequency domain, which of the following statements is true? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 59 | What assumptions about the object motion does the Kalman filter suppose? Please choose all correct answers. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 60 | The Harris corner detection method ensures which of the following properties? Choose all the correct answers. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 61 | In order to find connected components in binary images, an algorithm for labeling connected components (starting from 1) is used through loops: forward loop labels from left to right and from top to bottom; backward loop labels reverse, i.e., from right to left and from bottom to top. However, in some cases, more than two loops must be performed to achieve the correct labels of all connected components. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 62 | Suppose a hybrid image X is created from a low-pass filter on image A and a high-pass filter on image B. Which of the following statements is most reasonable?   Select one:  a. Image X contains detailed information from image A.   b. Image X contains the high-frequency information of A and the low-frequency information of B.   c. Image X contains detailed information from image B.  d. Image X contains detailed information from both of image A and B. | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 63 | What is an approach in object detection? | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 64 | Noise like the image below can be eliminated most effectively with which filter? | |  | | median | | | |  | | | 1 | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 65 |  | |  | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 66 | How many anchor boxes in total does the original YOLOv3 (proposed by Joseph Redmon) use? | | 9 | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 67 | In the bag-of-words method, what measure is used to weight the visual words? | | tf-idf | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 68 | What is the challenge in object recognition? Please choose all the correct answers.  Select one or more:  a. Diverse camera views make subjects appear different on different views   b. All object recognition techniques use deep neural networks, so they are expensive and difficult to deploy in practice   c. Objects may be obscured or mixed with the background   d. Light changes   e. Objects belonging to the same class can vary in type, size, and color   f. All object recognition techniques require a large number of labeled training datasets, at least thousands of samples per class.   g. Accurate object recognition requires very complex preprocessing   h. Objects are deformed and have different morphologies | | A,c,d,e,h | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 69 | Which of the following problems is not suitable for applying object detection techniques as a step in a pipeline to solve? | |  | |  | | | |  | | |  | | | | | 20 | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 70 | What are the local features used for the Viola-Jones face detector? | | Haar-like | |  | | | |  | | |  | | | | |  | | | |  | | | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  |  |  | |
| 71 | To remove noise after applying background subtraction algorithm, which of the following morphological transformations is the most suitable? | |  | |  | |  |  |  | |  | |  | |  |  | | |  |  | |  | |  | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |
| 72 | To remove noise after applying background subtraction algorithm, which of the following morphological transformations is the most suitable? | | opening | |  | |  |  |  | |  | |  | |  |  | | |  |  | |  | |  | |  | | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |
| 73 | | deep neural networks uses a feature pyramid architecture | | Faster R-CNN | |  | | | |  | | | |  | | | |  | | | | |  | | | |  |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | | |  | |  | |  | |  | |  | |  | |  |