MATLAB Functions

```
Output = function(Input1,...,InputN)
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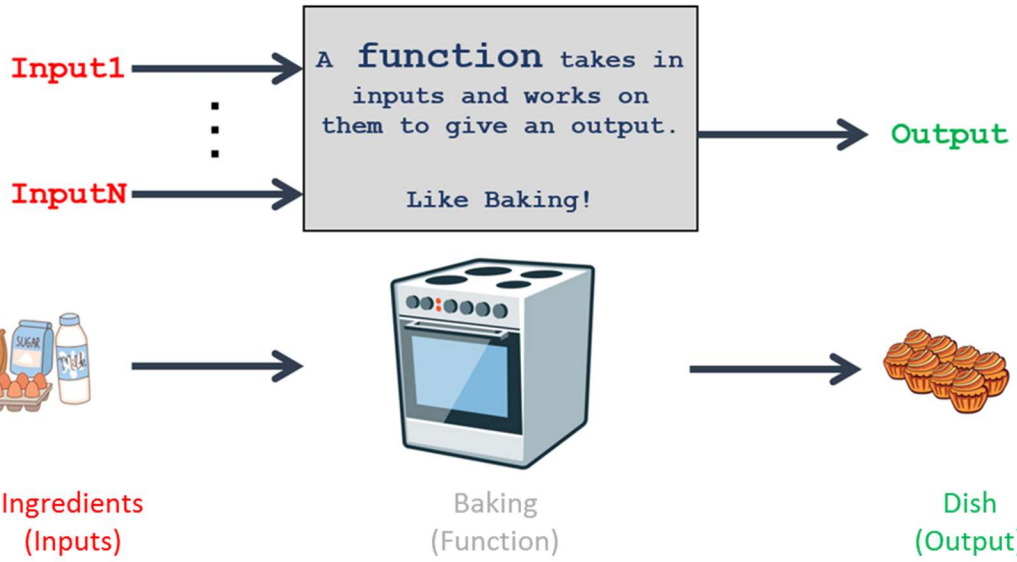

Useful MATLAB commands

Function	Syntax Example	Description
clc	`clc`	Clears Command Window
clear	`clear`	Clears Workspace
close	`close` `close all`	Closes an open figure Closes all open figures
figure	`figure`	Creates a new figure window
pause	`pause(0.5)`	Pauses MATLAB execution for 0.5 seconds

Read in and visualize images in MATLAB

Function	Syntax Example	Description
imread	`Img = imread('filename.jpg')`	Reads in an image into MATLAB
load	`load var.mat`	Loads MATLAB variables into Workspace
imshow	`imshow(Img)`	Shows the image in a figure window
imshowpair	`imshowpair(Img,Out,'montage')`	Shows two images side by side

Perform basic operations on images

Function	Syntax Example	Description
flip	`Out = flip(Img)`	Flips an image upside down
fliplr	`Out = fliplr(Img)`	Flips an image from left to right (mirror)
imrotate	`Out = imrotate(Img,60)`	Rotates an image by the degree or rotation specified
imresize	`Out = imresize(Img,0.5)` `Out = imresize(Img,[50 50])`	Resizes an image by the scale provided Resizes an image to the rows and columns specified
imsnip	`Out = imsnip(Img)`	Provides the ability to snip out a smaller portion of image
size	`sz = size(Img)`	Returns the number of rows, columns and pages an image has
numel	`k = numel(pics)`	Returns the number of elements in a vector, matrix or cell array

Apply special effects to images

Function		Syntax Example				Description				
imeffects		`Out = imeffects(Img, 'effect', 'optional input')`				Applies the 'effect' to an image. The 'optional input' controls the extent to which the 'effect' is applied				
'effect'	'wave'	'barrel'	'pincushion'	'pencil'	'blur'	'neon'	'grayscale'	'sharpen'	'ripple'	'negative'
'optional input'		0 – 10	0 – 10	'light' 'dark'	'open' 'close' 'dilate'	0 –20			0 – 5	

Add color filters to images

Function	Syntax Example	Description
newFilter	`filter = newFilter(500,300,[255 255 0])`	Creates a new filter with 500 rows, 300 columns with RGB values 255, 255, and 0

Text in images

Function	Syntax Example	Description
readtext	`txt = readtext(Img)` `txt = readtext(Img,roi)`	Read text from images Read text from the specified region of interest
getroi	`roi = getroi(Img)`	Specify region of interest in image
createNewPage	`page = createNewPage(200, 400)` `page = createNewPage(200,400,[100 180 200])`	Creates a blank white page with 200 rows and 400 columns Create blank page as above with RGB values 100, 180, and 200

writetext	`Out = writetext(Img,'message')`
	`Out = writetext(Img,'message',30, [255 0 255])`
	`Out = writetext(Img,'message',30, [255 0 255],[375 490])`
		Writes the 'message' in the image
		Writes the 'message' in the image with specified font size and font color
		Writes the 'message' in the image in the row and column location specified

SwapCipher	`cipher = SwapCipher('hello')`	Performs swap cipher by swapping the letters in a word (hello -> olleh)
SwapDecipher	`decode = SwapDecipher('olleh')`	Deciphers any message enciphered using Swap Cipher
AtbashCipher	`cipher = AtbashCipher('abc')`	Performs Atbash cipher replacing a→z, b→y, c→x, etc
AtbashDecipher	`decode = AtbashDecipher('zyx')`	Deciphers any message enciphered using Atbash Cipher
CaesarCipher	`cipher = CaesarCipher('abc')`	Performs Caesar cipher by shifting the letters by 3, a→d,b→e,etc
CaesarDecipher	`decode = CaesarDecipher('def')`	Deciphers any message enciphered using Caesar Cipher

Create and Apply Masks on Images Manually

Function	Syntax Example	Description
viewMasks	`viewMasks`	Shows all the available masks
getPoints	`loc = getPoints(Img)`	Returns the row and column location of point clicked in the image
superImpose	`Out = superimpose(face,mask,loc)`	Applies the mask on the face image at the location specified
SelectFreehand	`Out = SelectFreehand(Img)`	Provides the ability to select any portion of an image freehand

Create and Apply Masks on Images using Face Detection

Function	Syntax Example	Description
findFaces	`bb = findFaces(Img)`	Returns the bounding boxes for faces found in an image
markFaces	`Out = markFaces(Img,bb)`	Puts the bounding boxes in the face image
addMasks	`Out = addMasks(Img,mask,bb,offset)`	Adds masks on the bounding box locations with the offset specified

Create Collages and Videos

Function	Syntax Example	Description
imwrite	`imwrite(Img,'myPicture.jpg')`	Creates a JPG file from a MATLAB variable
imreadfolder	`allImages = imreadfolder('C:/Desktop/MyImages')`	Reads in all the images in a folder and stores them in a cell array
montage	`montage(allImages)`	Shows all the images in the cell array one after the other in one figure
shiftImage	`shiftImage(bg, Img,'top',10)`	Shifts image I in 10 steps from the top direction over background bg
writeGifFrame	`writeGifFrame('myGif.gif', allImages{k},k,0.1)`	Saves multiple images as a GIF files by taking the output file name, gif frame image, current index and delay between frames as input.