

Edge Features

Introduction to Image Data



Colour Image

										R			
					141	142	143	144	145				
					151	152	153	154	155				
					161	162	163	164	165				
					35	36	37	38	39	173	174	175	
					45	46	47	48	49	183	184	185	
					55	56	57	58	59	193	194	195	
31	32	33	34	35	67	68	69						
41	42	43	44	45	77	78	79	G					
51	52	53	54	55	87	88	89						
61	62	63	64	65									
71	72	73	74	75	B								
81	82	83	84	85									

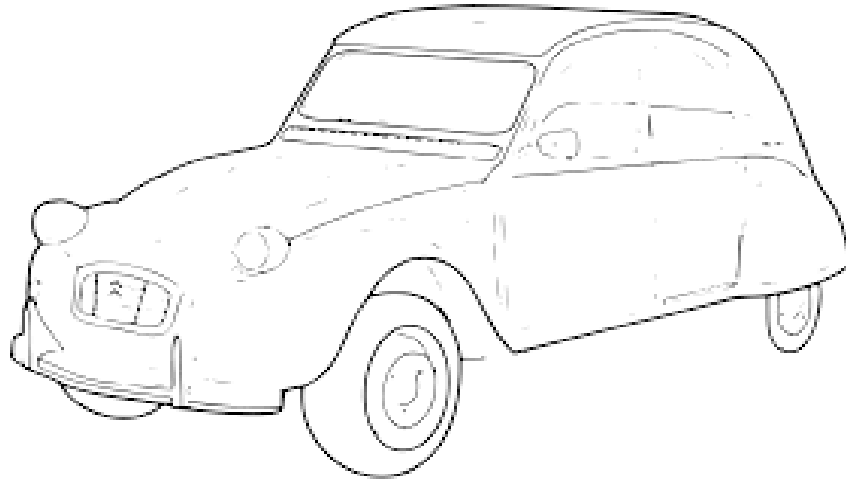
Can you identify the object?



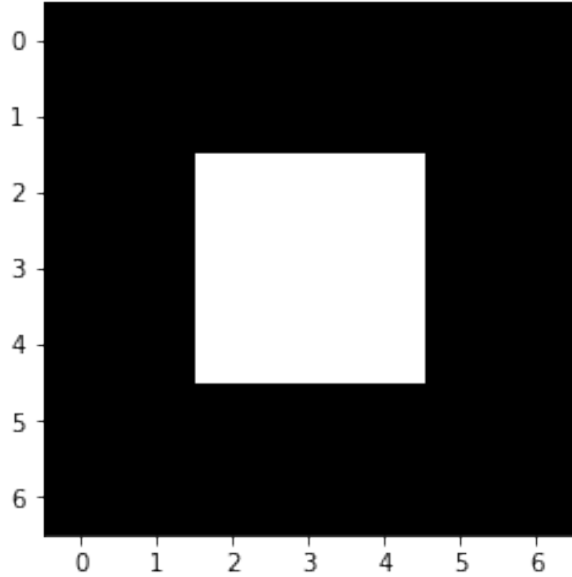
Can you identify the object?



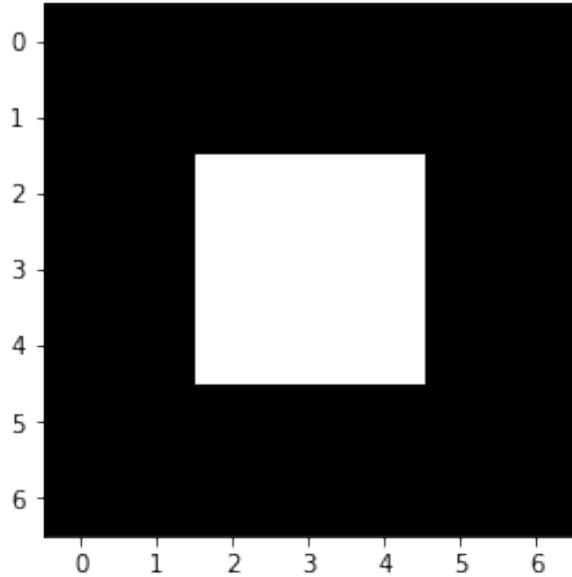
Can you identify the object?



What is an Edge?

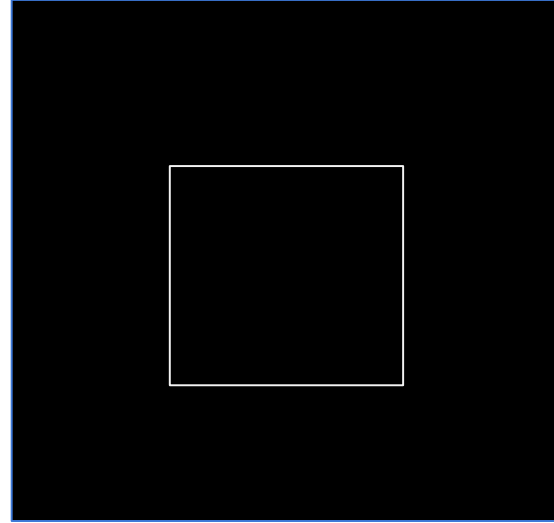
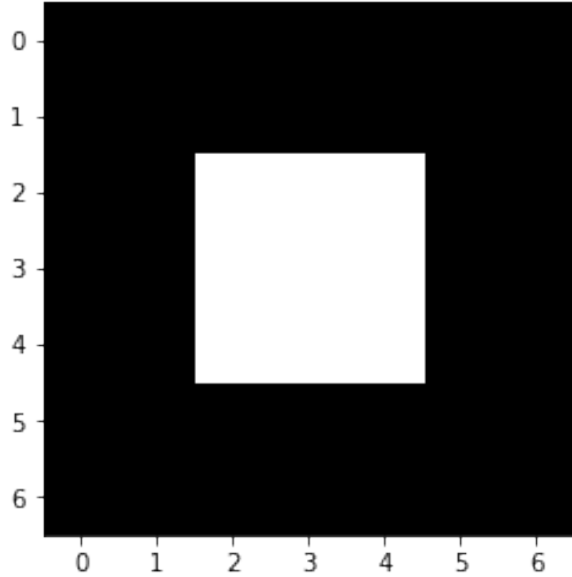


What is an Edge?



5	5	5	5	5	5	5
5	5	5	5	5	5	5
5	5	100	100	100	5	5
5	5	100	100	100	5	5
5	5	100	100	100	5	5
5	5	100	100	100	5	5
5	5	5	5	5	5	5
5	5	5	5	5	5	5

What is an Edge?



What is an Edge?

- The pixel values around an edge show sudden change from left to right or from up to down
- Edges often represent the boundary of objects present in an image

What is an Edge?

5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5
5	5	100	100	100	100	100	5	5
5	5	100	100	100	100	100	5	5
5	5	100	100	100	100	100	5	5
5	5	100	100	100	100	100	5	5
5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5

How Kernels Work?

5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5
5	5	100	100	100	100	100	5	5
5	5	100	100	100	100	100	5	5
5	5	100	100	100	100	100	5	5
5	5	100	100	100	100	100	5	5
5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5

-1	0	1
-1	0	1
-1	0	1

Kernel

How Kernels Work?

5	5	5
5	5	100
5	5	100

-1	0	1
-1	0	1
-1	0	1

How Kernels Work?

5	5	5
5	5	100
5	5	100

5

-1	0	1
-1	0	1
-1	0	1

How Kernels Work?

5	5	5
5	5	100
5	5	100

$$5 + (-5)$$

-1	0	1
-1	0	1
-1	0	1

How Kernels Work?

5	5	5
5	5	100
5	5	100

$$5 + (-5) + 100 + 100 + (-5) + (-5)$$

-1	0	1
-1	0	1
-1	0	1

How Kernels Work?

5	5	5
5	5	100
5	5	100

-1	0	1
-1	0	1
-1	0	1

$$5 + (-5) + 100 + 100 + (-5) + (-5) \\ = 190$$

Kernels

-1	0	1
-1	0	1
-1	0	1

Prewitt Kernel
X Direction

Kernels

-1	0	1
-1	0	1
-1	0	1

Prewitt Kernel
X Direction

-1	-1	-1
0	0	0
1	1	1

Prewitt Kernel
Y Direction

Kernels

-1	0	1
-1	0	1
-1	0	1

Prewitt Kernel
X Direction

-1	-1	-1
0	0	0
1	1	1

Prewitt Kernel
Y Direction

-1	0	1
-2	0	2
-1	0	1

Sobel Kernel
X Direction

-1	-2	-1
0	0	0
1	2	1

Sobel Kernel
Y Direction

Application of Edge Features

- Used to sharpen an image by finding out the edges and then enhancing them

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Application of Edge Features

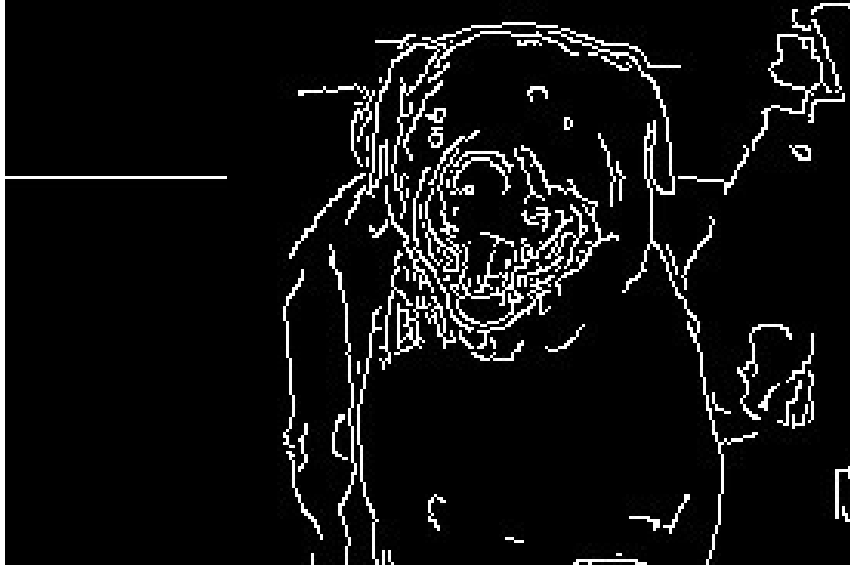
- Used to sharpen an image by finding out the edges and then enhancing them



Limitations



Limitations



Thank You!