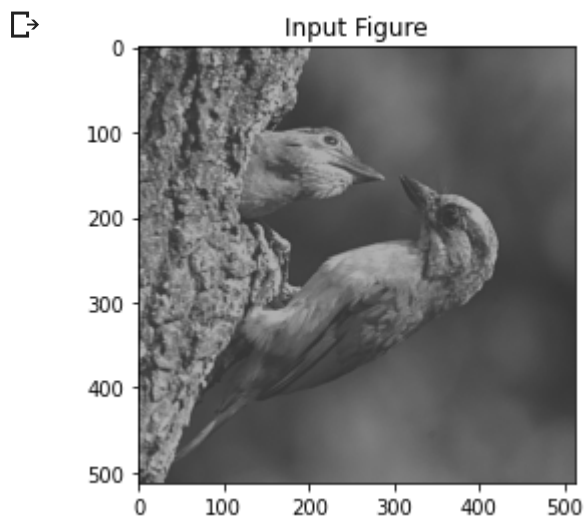


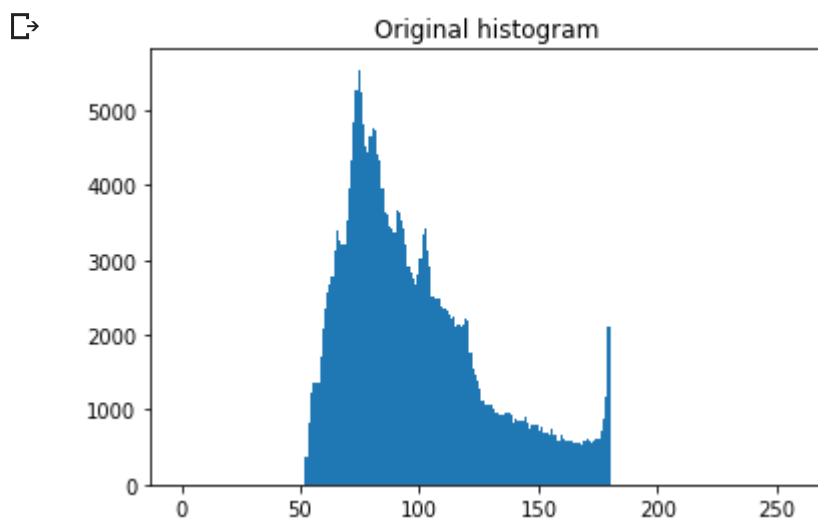
```
import os
from google.colab import drive
from matplotlib import pyplot as plt
import numpy as np
import cv2
import math
drive.mount('/content/gdrive')

os.chdir("/content/gdrive/My Drive/影像處理") #更改路徑
```

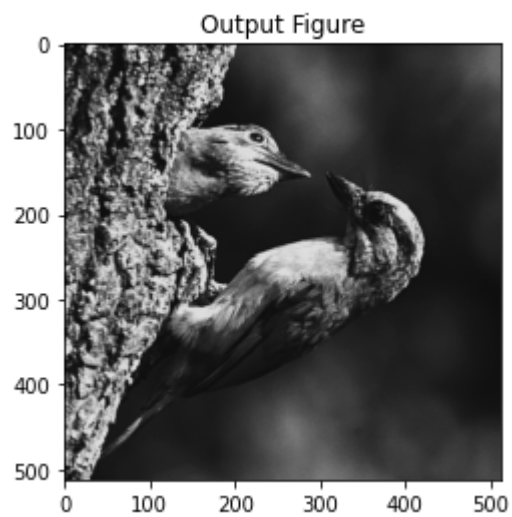
```
img = cv2.imread('Bird feeding 3 low contrast.tif', cv2.IMREAD_GRAYSCALE)
show_img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
plt.imshow(show_img)
plt.title('Input Figure')
plt.show()
```



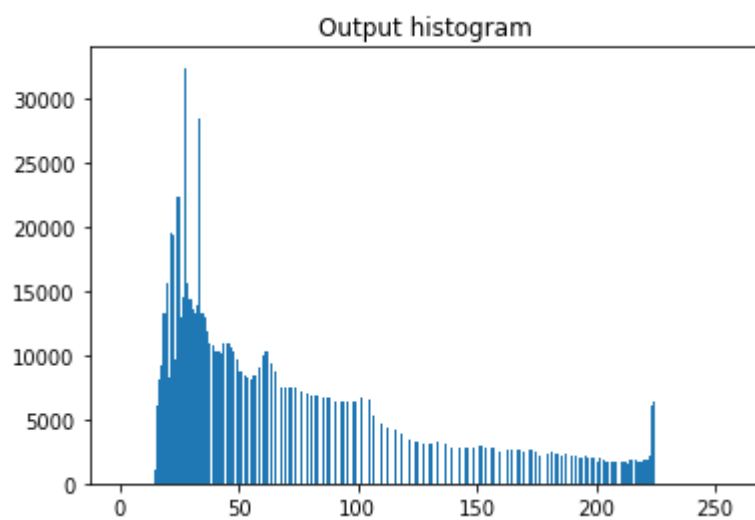
```
plt.hist(img.ravel(),256,[0,256])
plt.title('Original histogram')
plt.show()
```



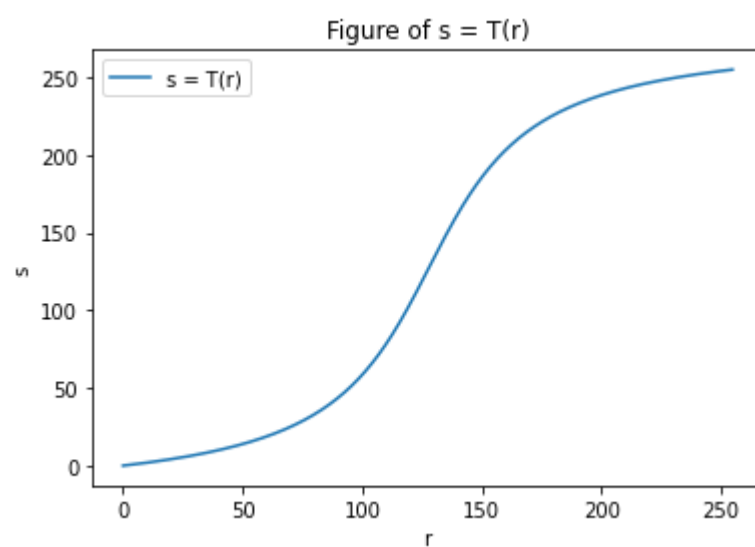
```
new_img = ((np.arctan((show_img - 128.0) / 32.0) + 1.3258) * 96.234).astype(int)
plt.imshow(new_img)
plt.title('Output Figure')
plt.show()
```



```
plt.hist(new_img.ravel(),256,[0,256])  
plt.title('Output histogram')  
plt.show()
```



```
x = np.arange(0, 255, 0.1)  
y = (np.arctan((x - 128.0) / 32.0) + 1.3258) * 96.234  
plt.plot(x, y, label="s = T(r)")  
plt.xlabel("r")  
plt.ylabel("s")  
plt.title('Figure of s = T(r)')  
plt.legend()  
plt.show()
```



x ∴ f(x) ∴		x ∴ f(x) ∴		x ∴ f(x) ∴		x ∴ f(x) ∴	
0	-0.0016998454294	19	3.9030916740624	38	9.298048614221	57	17.1722912995943
1	0.1765110619657	20	4.1437513786899	39	9.6389247621793	58	17.6860481804599
2	0.357380577646	21	4.388543219554	40	9.9866522461136	59	18.2120914547793
3	0.5409673347824	22	4.6375712905712	41	10.341430362325	60	18.7508346019095
4	0.7273316624457	23	4.8909430928018	42	10.703465804613	61	19.3027081219318
5	0.9165356457401	24	5.1487696694843	43	11.0729729879891	62	19.8681602996884
6	1.1086431884338	25	5.4111657472288	44	11.450174387969	63	20.447657999646
7	1.3037200782062	26	5.6782498836794	45	11.8353008961963	64	21.0416874918035
8	1.5018340546335	27	5.9501446219706	46	12.2285921931723	65	21.6507553086423
9	1.7030548800432	28	6.2269766523187	47	12.6302971388969	66	22.2753891328526
10	1.9074544133736	29	6.5088769811094	48	13.0406741822513	67	22.9161387152512
11	2.1151066871832	30	6.7959811078586	49	13.4599917899742	68	23.5735768219212
12	2.326087987959	31	7.0884292104439	50	13.8885288961104	69	24.2483002091508
13	2.5404769398846	32	7.3863663390264	51	14.3265753728229	70	24.9409306242047
14	2.7583545922338	33	7.6899426190986	52	14.7744325234822	71	25.6521158293271
15	2.9798045105677	34	7.9993134641228	53	15.2324135989504	72	26.3825306456198
16	3.2049128719178	35	8.3146397982412	54	15.7008443379872	73	27.1328780125675
17	3.4337685641526	36	8.6360882895663	55	16.1800635326996	74	27.9038900579511
18	3.6664632897316	37	8.963831594583	56	16.6704236199474	75	28.6963291717028
x ∴ f(x) ∴		x ∴ f(x) ∴		x ∴ f(x) ∴		x ∴ f(x) ∴	
76	29.5109890758721	95	50.5246240566562	114	87.899130763317	133	142.5029936623085
77	30.3486958812806	96	52.00503034361	115	90.4520043931458	134	145.4238118198857
78	31.210309119601	97	53.5324258846419	116	93.0611005171818	135	148.3117700727121
79	32.0967227374934	98	55.1082768278842	117	95.7243373544545	136	151.1623138673507
80	33.0088660370165	99	56.7340397794013	118	98.439214776803	137	153.9712676910492
81	33.9477045437886	100	58.4111510164126	119	101.2028067089508	138	156.734859623197
82	34.9142407812508	101	60.1410141116478	120	104.0117605326493	139	159.4497370455454
83	35.9095149258667	102	61.9249858581835	121	106.8623043272879	140	162.1129738828182
84	36.9346053141227	103	63.7643603999218	122	109.7502625801143	141	164.7220700068542
85	37.9906287677574	104	65.6603514963871	123	112.6710807376915	142	167.274943636683
86	39.078740698708	105	67.6140728831251	124	115.619858654787	143	169.7699177013707
87	40.2001349497941	106	69.6265167320479	125	118.5913926419843	144	172.2057012045836
88	41.3560433211613	107	71.6985302707688	126	121.5802254388491	145	174.5813666459621
89	42.5477347259712	108	73.8307906872276	127	124.5807030696716	146	176.8963245235435
90	43.7765139117816	109	76.0237785261127	128	127.5870372	147	179.1502958738872
91	45.0437196765588	110	78.2777498764565	129	130.5933713303284	148	181.3432837127724
92	46.3507225003851	111	80.5927077540379	130	133.593848961151	149	183.4755441292312
93	47.6989215058065	112	82.9683731954164	131	136.5826817580157	150	185.5475576679522
94	49.0897406515866	113	85.4041566986293	132	139.554215745213	151	187.5600015168749

x ⋮		f(x) ⋮	x ⋮		f(x) ⋮	x ⋮		f(x) ⋮	x ⋮		f(x) ⋮
152	189.5137229036129		171	217.1834456322426		190	232.8986852671474		209	242.5437772611031	
153	191.4097140000782		172	218.2394690858773		191	233.5233190913577		210	242.9454822068277	
154	193.2490885418165		173	219.2645594741333		192	234.1323869081965		211	243.3387735038037	
155	195.0330602883522		174	220.2598336187492		193	234.726416400354		212	243.723900012031	
156	196.7629233835874		175	221.2263698562114		194	235.3059141003116		213	244.1011014120109	
157	198.4400346205988		176	222.1652083629835		195	235.8713662780681		214	244.470608595387	
158	200.0657975721158		177	223.0773516625066		196	236.4232397980905		215	244.832644037675	
159	201.6416485153581		178	223.963765280399		197	236.9619829452207		216	245.1874221538864	
160	203.16904405639		179	224.8253785187194		198	237.4880262195401		217	245.5351496378208	
161	204.6494503433439		180	225.6630853241279		199	238.0017831004056		218	245.876025785779	
162	206.0843337484135		181	226.4777452282972		200	238.5036507800525		219	246.210242805417	
163	207.4751528941935		182	227.2701843420489		201	238.9940108673004		220	246.5379861104337	
164	208.8233518996149		183	228.0411963874325		202	239.4732300620128		221	246.8594346017587	
165	210.1303547234412		184	228.7915437543802		203	239.9416608010496		222	247.1747609358772	
166	211.3975604882184		185	229.5219585706729		204	240.3996418765178		223	247.4841317809014	
167	212.6263396740288		186	230.2331437757953		205	240.8474990271771		224	247.7877080609736	
168	213.8180310788387		187	230.9257741908492		206	241.2855455038896		225	248.0856451895561	
169	214.9739394502059		188	231.6004975780788		207	241.7140826100258		226	248.3780932921414	
170	216.095333701292		189	232.2579356847488		208	242.1334002177487		227	248.6651974188906	
x ⋮		f(x) ⋮	x ⋮		f(x) ⋮						
228	248.9470977476813		247	253.4710195199568							
229	249.2239297780294		248	253.6722403453665							
230	249.4958245163206		249	253.8703543217938							
231	249.7629086527712		250	254.0654312115663							
232	250.0253047305157		251	254.2575387542599							
233	250.2831313071982		252	254.4467427375543							
234	250.5365031094288		253	254.6331070652176							
235	250.785531180446		254	254.816693822354							
236	251.0303230213102		255	254.9975633380343							
237	251.2709827259376										
238	251.5076111102684										
239	251.7403058358474										
240	251.9691615280822										
241	252.1942698894323										
242	252.4157198077662										
243	252.6335974601155										
244	252.847986412041										
245	253.0589677128168										
246	253.2666199866264										