final_report

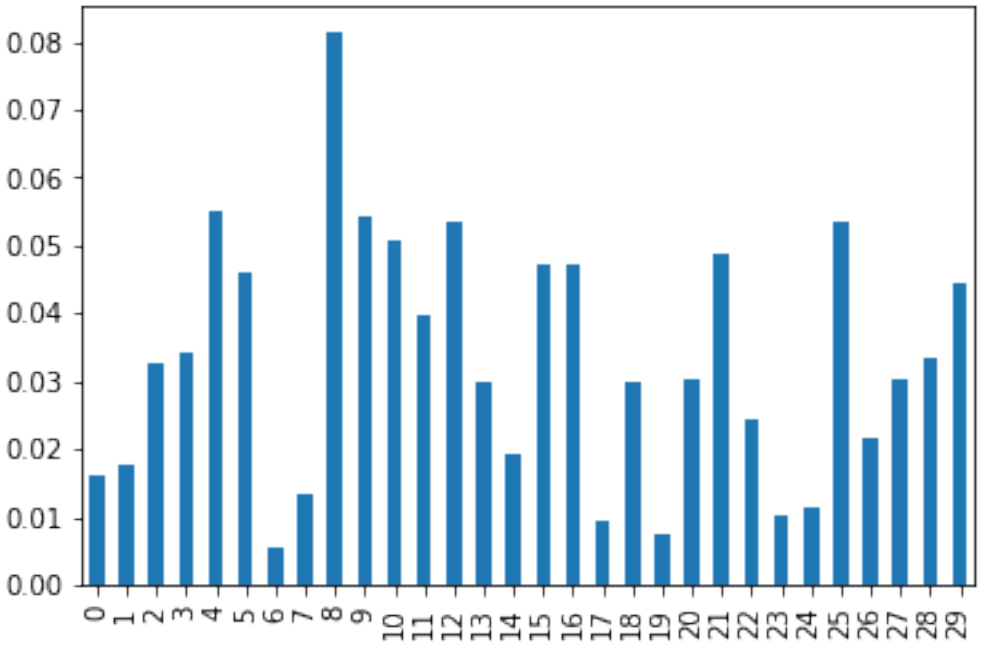
April 9, 2018

0.1 Problem 1

0.1.1 plot of probability for each topic

In [75]:

Out[75]: <matplotlib.axes._subplots.AxesSubplot at 0x1b88c785da0>



0.1.2 Top 10 words for each topic with the highest probability

In [76]:

Out[76]:

	top1	top2	top3	top4	top5
0	model	direction	cell	head	neuron
1	signal	model	system	sound	speech
2	network	learning	algorithm	set	training

3	function	network	neural	weight	input
4	network	unit	input	learning	neural
5	function	set	algorithm	learning	data
6	learning	function	model	data	error
7	network	neural	system	set	input
8	neuron	cell	model	input	network
9	network	recognition	neural	training	system
10	learning	network	error	function	algorithm
11	network	input	learning	unit	neural
12	model	data	algorithm	set	point
13	model	learning	control	system	network
14	network	neuron	pattern	neural	function
15	model	data	network	function	set
16	model	data	network	distribution	function
17	algorithm	function	loss	learning	bound
18	network	weight	error	training	neural
19	circuit	current	input	voltage	neuron
20	model	network	image	input	object
21	network	unit	learning	input	weight
22	network	chip	neural	weight	neuron
23	learning	system	network	instruction	performance
24	network	learning	input	cell	system
25	learning	algorithm	action	function	policy
26	model	network	data	tree	system
27	motion	circuit	network	system	chip
28	network	training	classifier	set	data
29	model	visual	network	unit	object

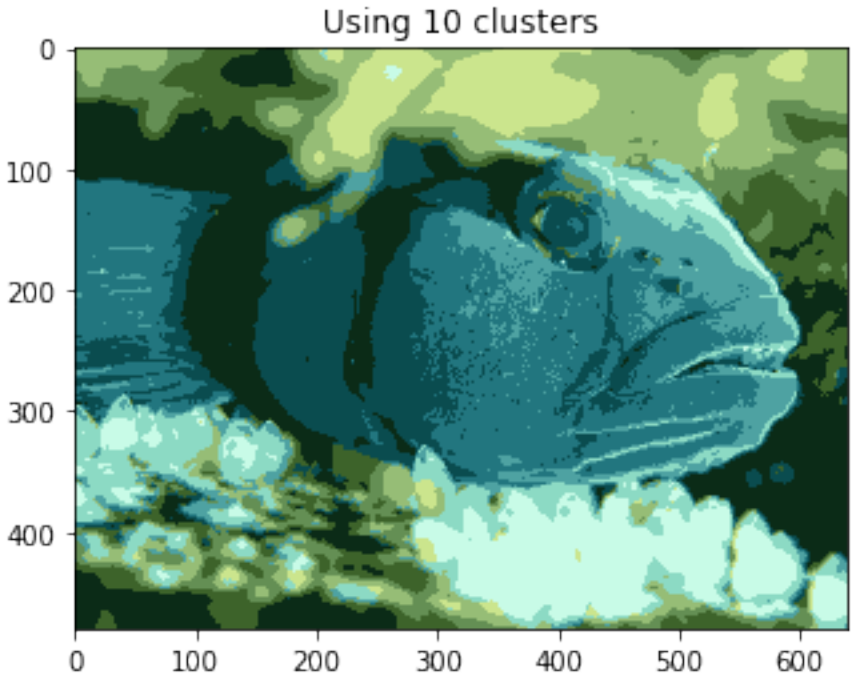
	top6	top7	top8	top9	top10
0	network	movement	eye	unit	population
1	auditory	channel	frequency	output	filter
2	neural	problem	input	data	function
3	threshold	bound	number	result	set
4	function	object	pattern	system	output
5	error	training	vector	problem	examples
6	subscriber	network	problem	set	cost
7	unit	data	training	model	output
8	spike	synaptic	firing	pattern	system
9	input	set	word	learning	character
10	weight	input	training	equation	neural
11	training	system	set	weight	output
12	parameter	function	problem	method	learning
13	controller	dynamic	neural	movement	forward
14	model	memory	dynamic	system	synaptic
15	method	algorithm	input	neural	parameter
16	gaussian	algorithm	mean	parameter	set
17	document	weight	linear	vector	set
18	unit	set	input	model	function

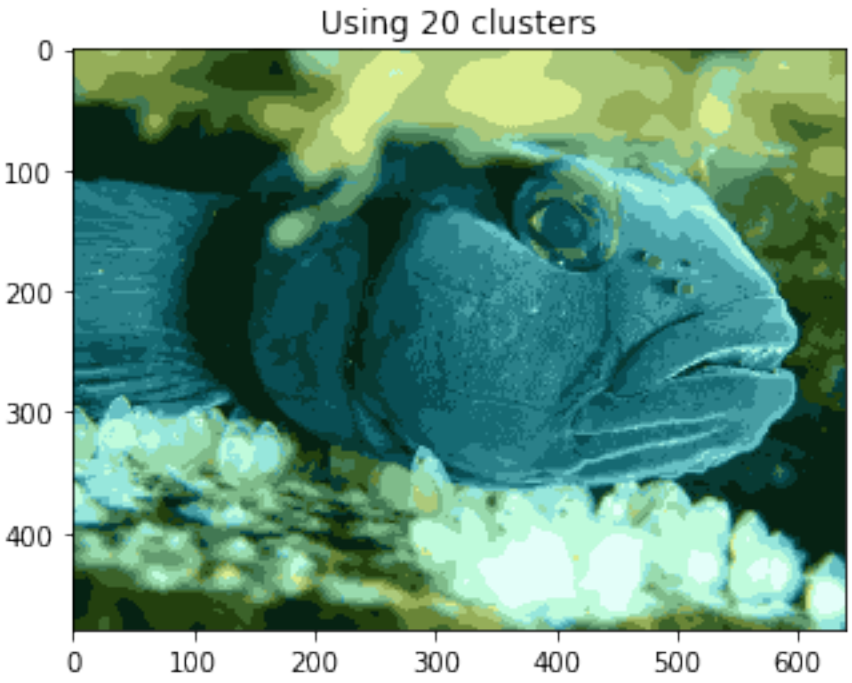
19	output	transistor	model	channel	network
20	images	visual	neural	system	filter
21	function	algorithm	output	hidden	error
22	input	analog	output	system	learning
23	model	return	function	neural	reinforcement
24	neural	model	memory	set	song
25	problem	optimal	model	system	step
26	parameter	hmm	algorithm	context	set
27	analog	output	cell	input	current
28	performance	algorithm	neural	input	output
29	map	system	input	representation	pattern

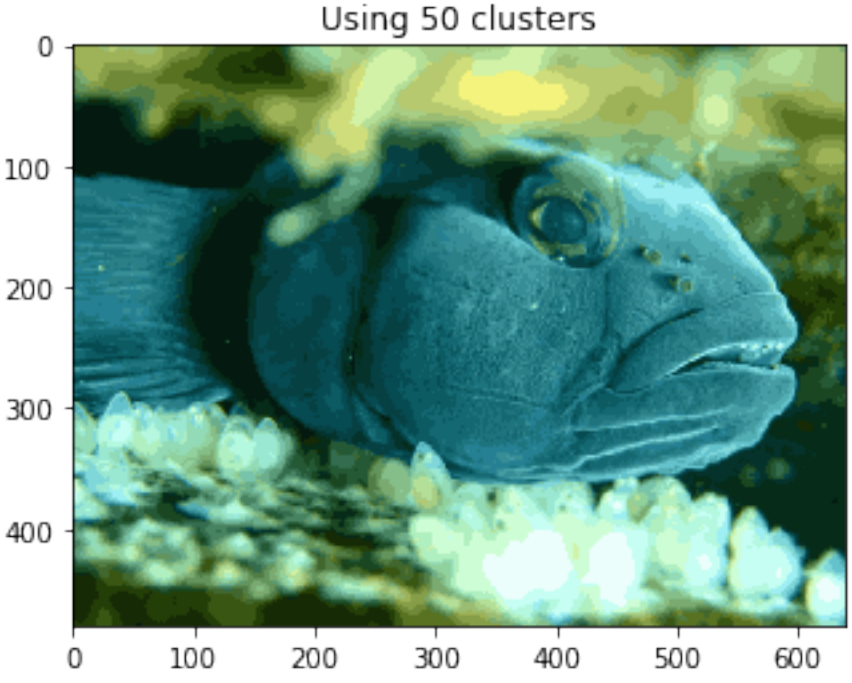
1 Problem 2

1.0.1 Segment each test images using 10,20,50 clusters

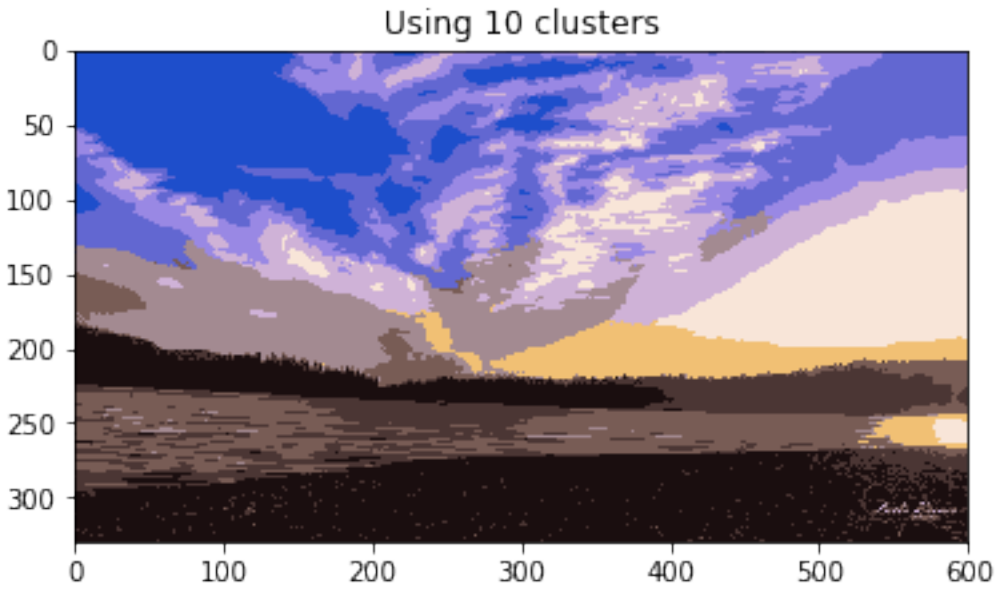
In [275]:

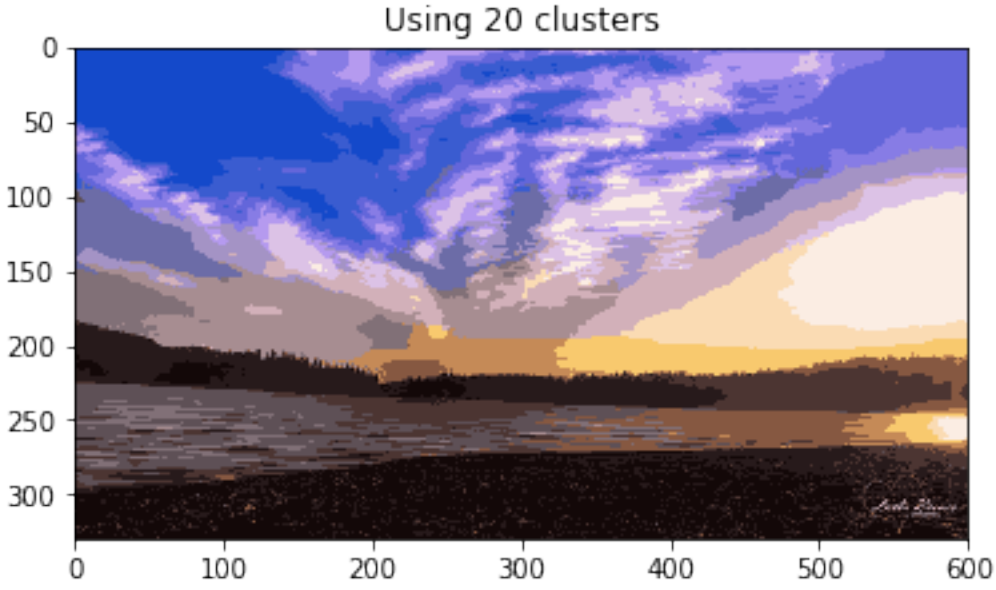


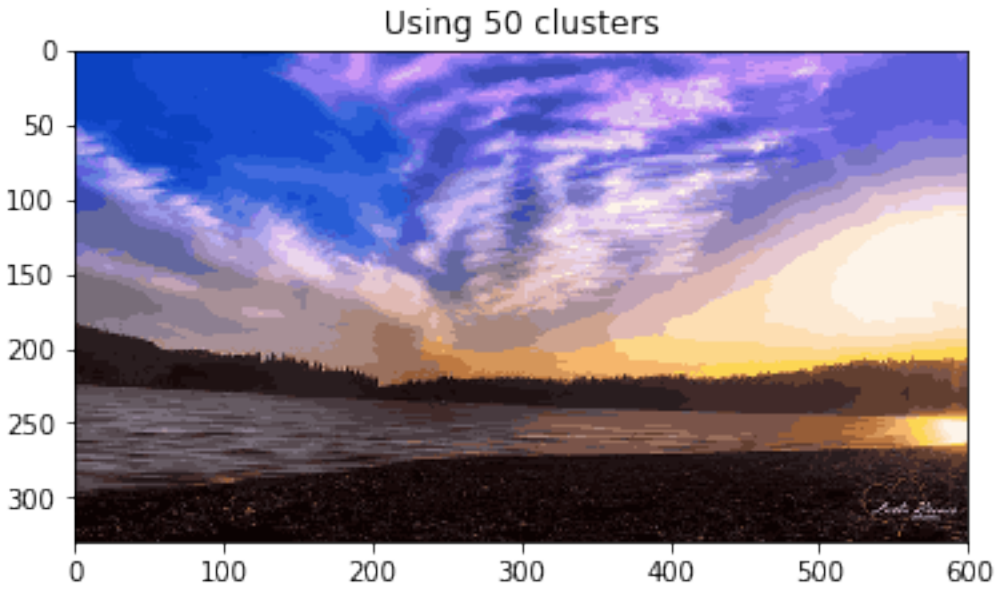

Using 20 clusters
0
100
200
300
400
0
100
200
300
400
500
600


Using 50 clusters
0
100
200
300
400
0
100
200
300
400
500
600

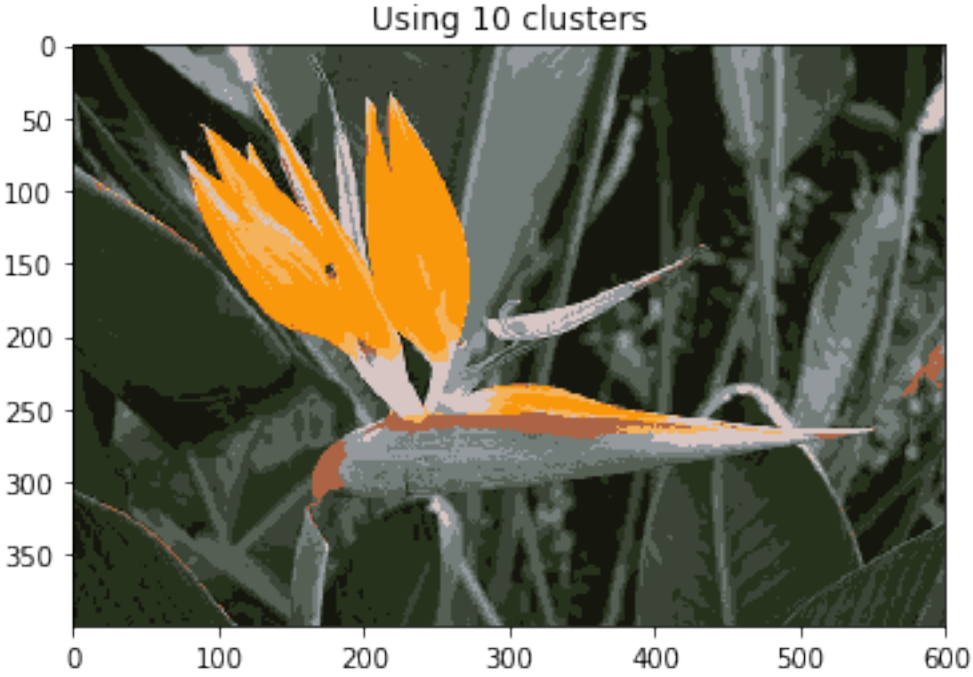
In [276]:

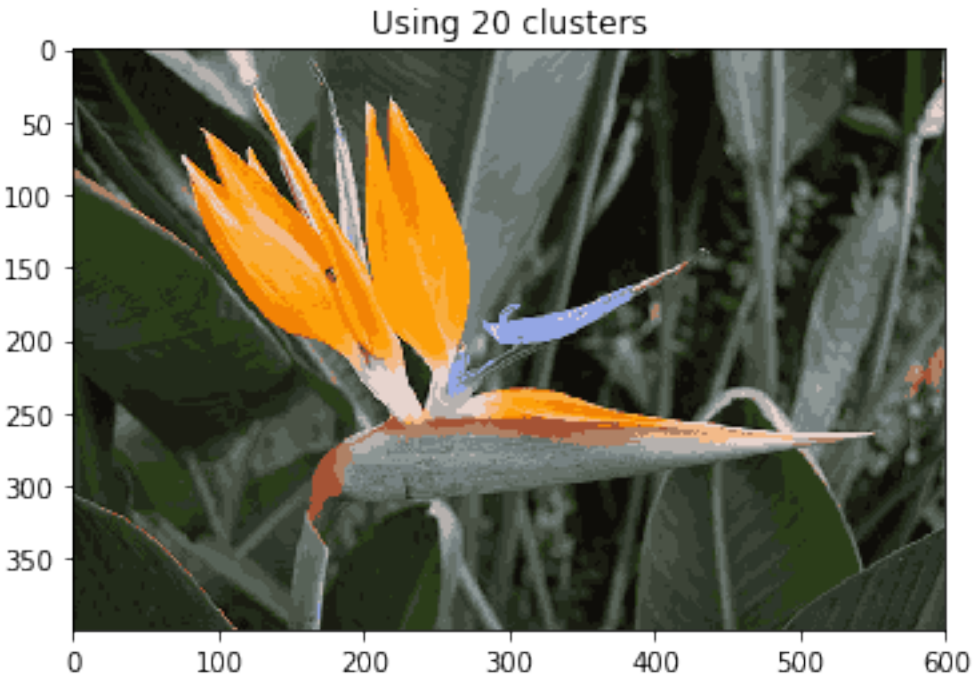

Using 10 clusters
0
50
100
150
200
250
300
0
100
200
300
400
500
600

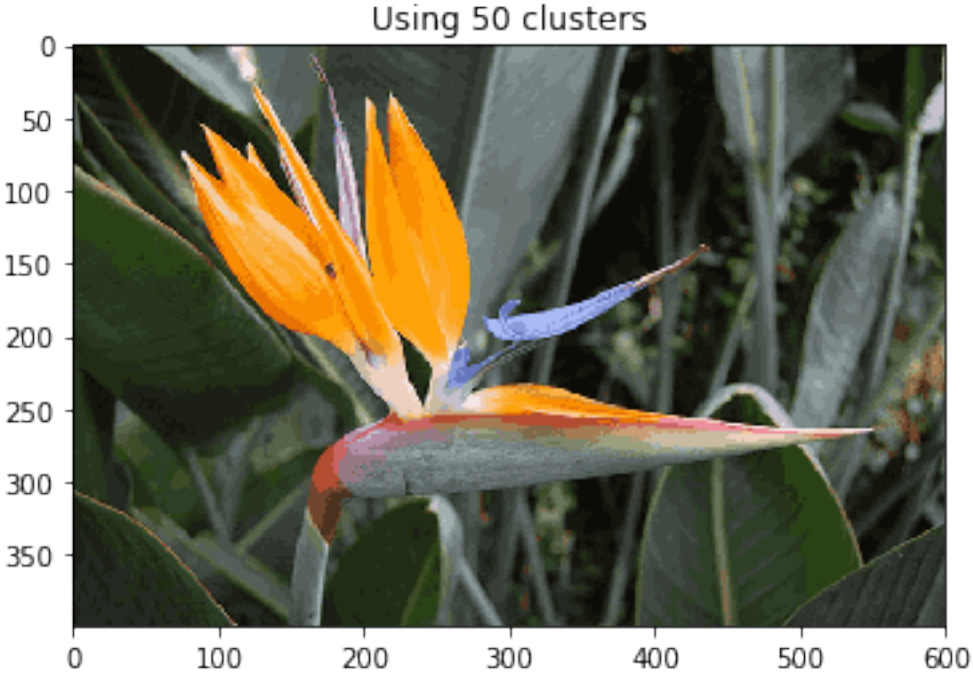

Using 20 clusters
0
50
100
150
200
250
300
0
100
200
300
400
500
600


Using 50 clusters
0
50
100
150
200
250
300
0
100
200
300
400
500
600

In [277]:

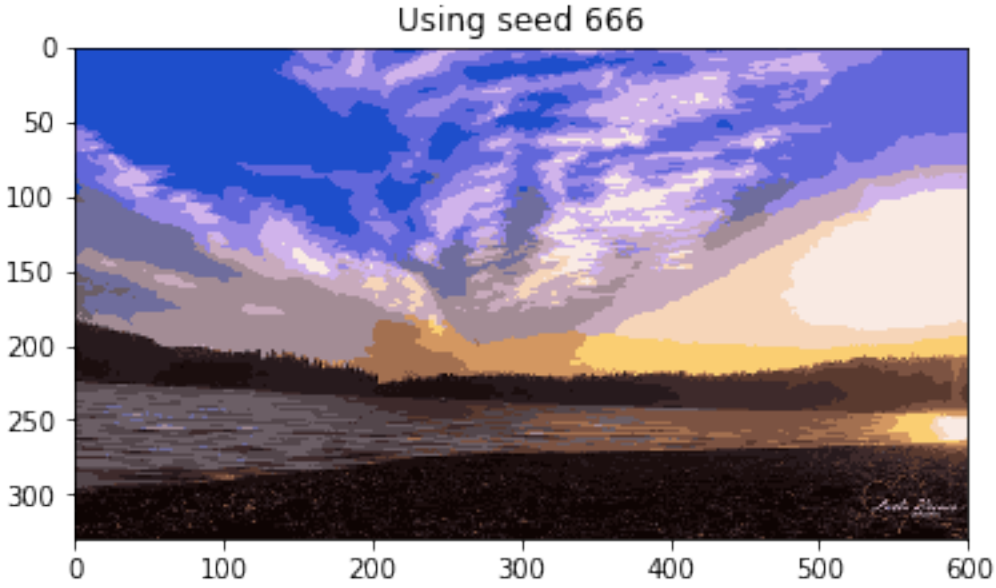

Using 10 clusters
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600

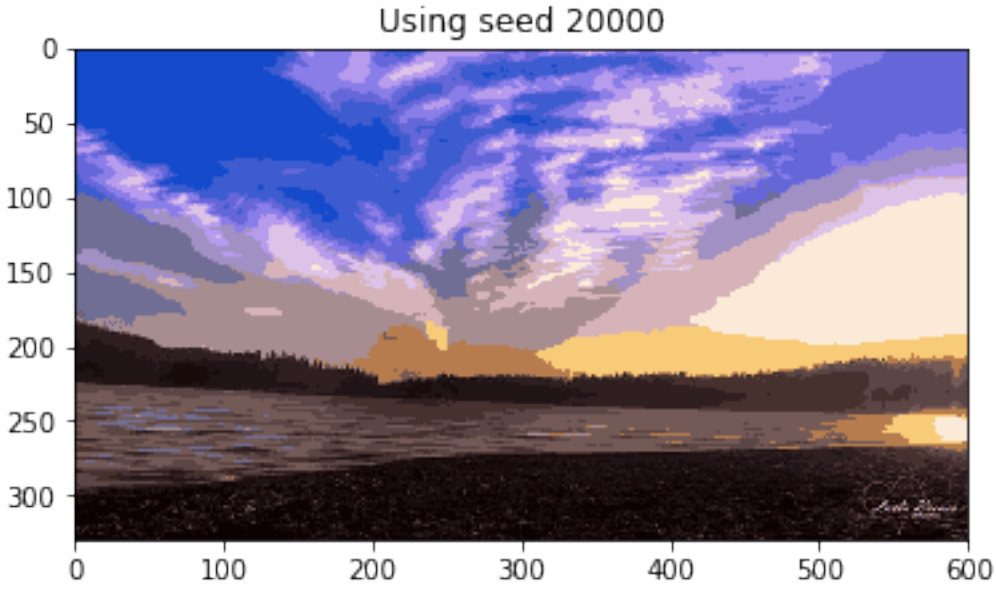

Using 20 clusters
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600

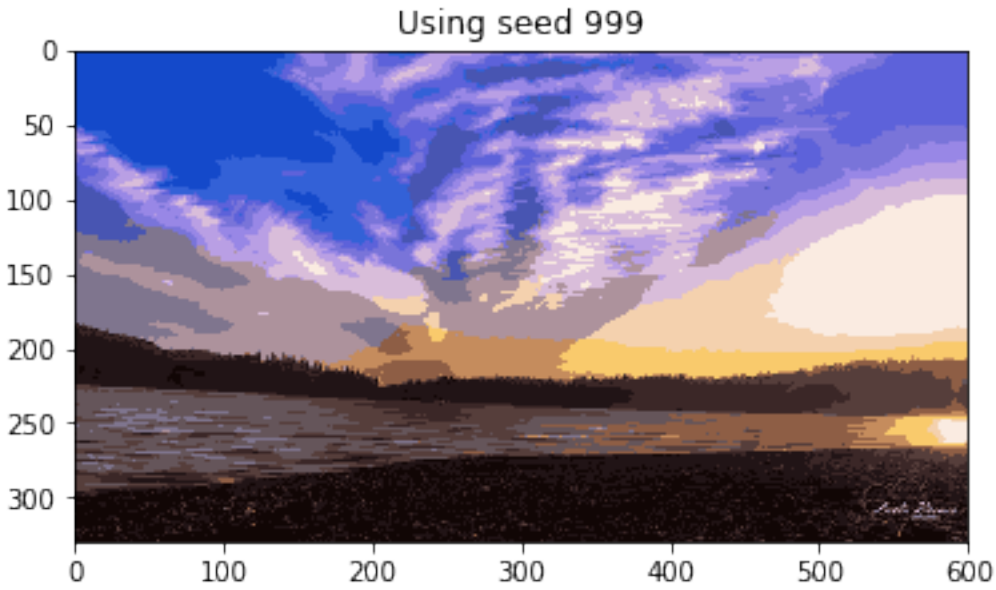

Using 50 clusters
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600

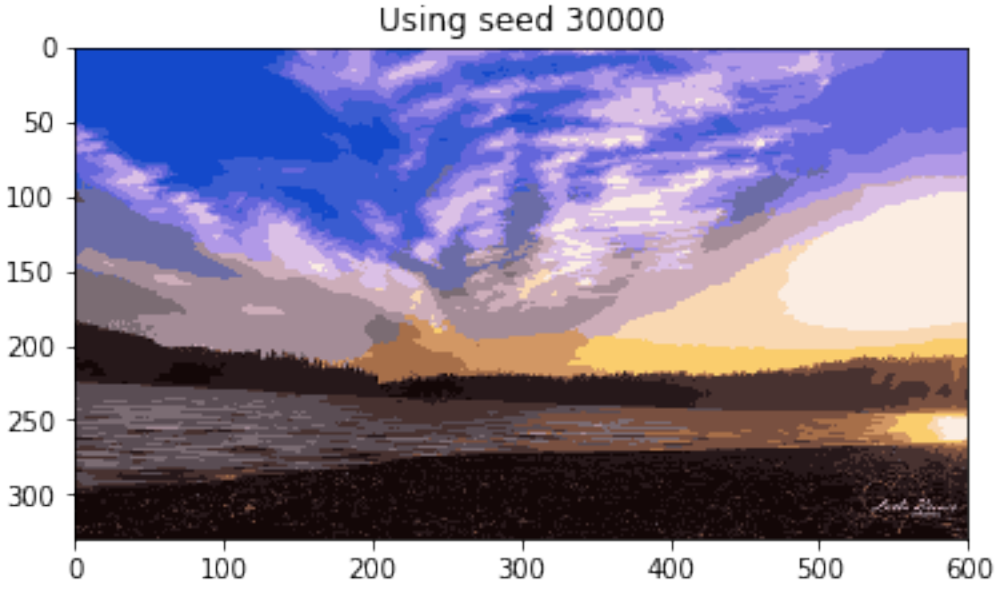
1.0.2 Using 5 different seed to run kmeans as 5 different starting point.

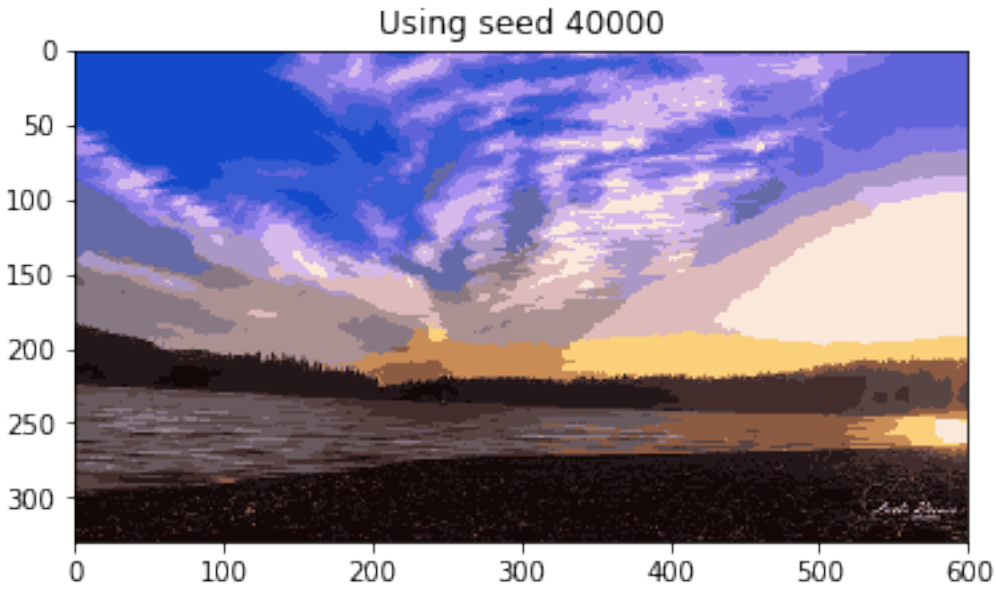
In [29]:






Using seed 999
0
50
100
150
200
250
300
0
100
200
300
400
500
600


Using seed 30000
0
50
100
150
200
250
300
0
100
200
300
400
500
600



1.0.3 There is not much variation in the result.However, I see some minor differences in some small areas. like the yellow area on the right.