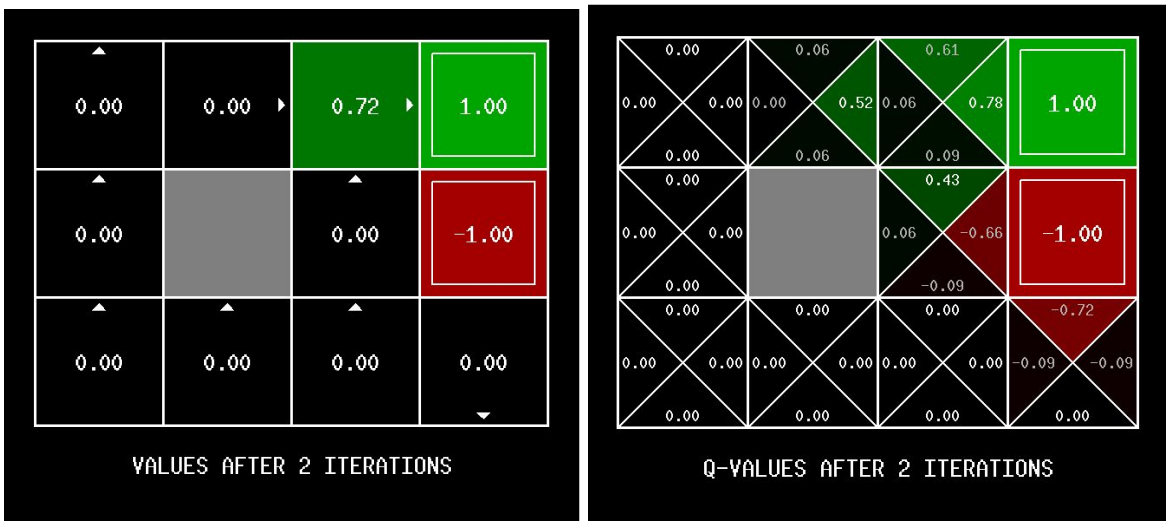
ASSIGNMENT-4

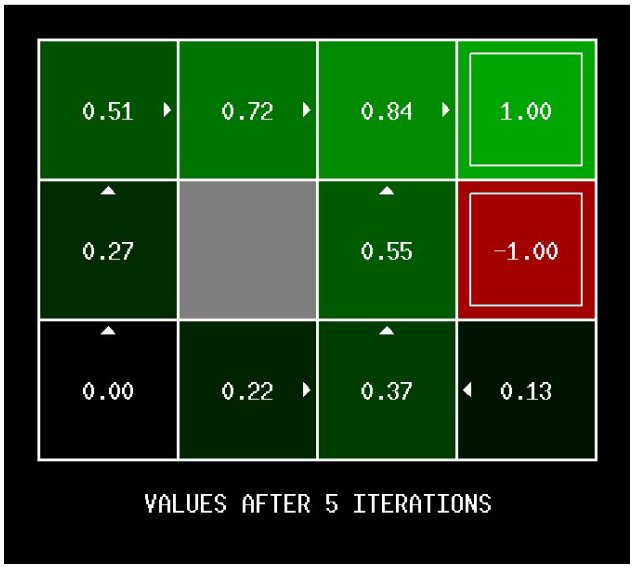
-ISHMEET KAUR

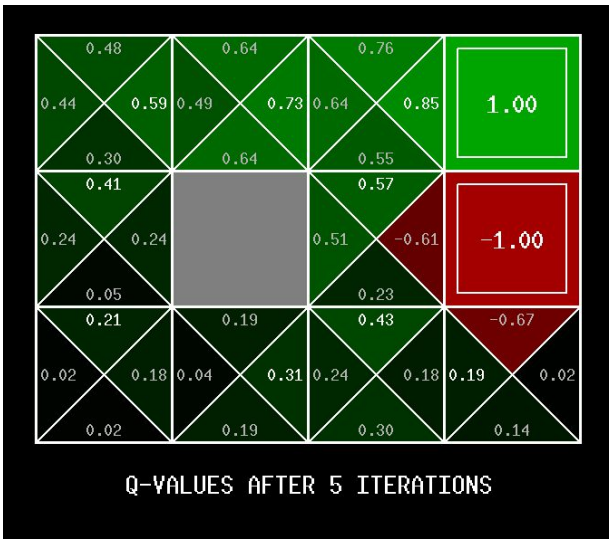
QUES 1.

1.

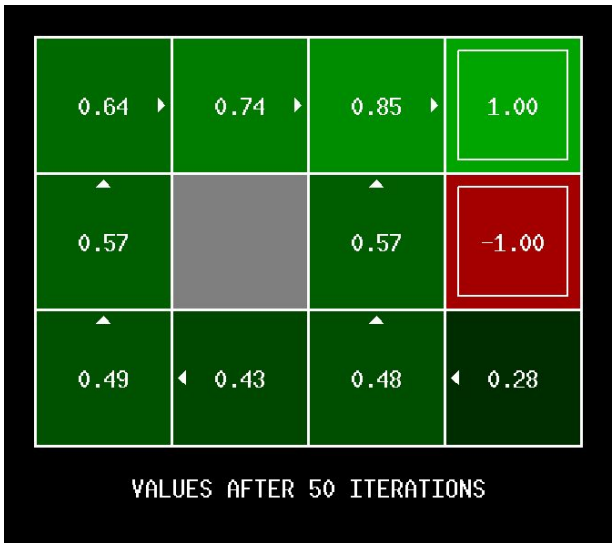


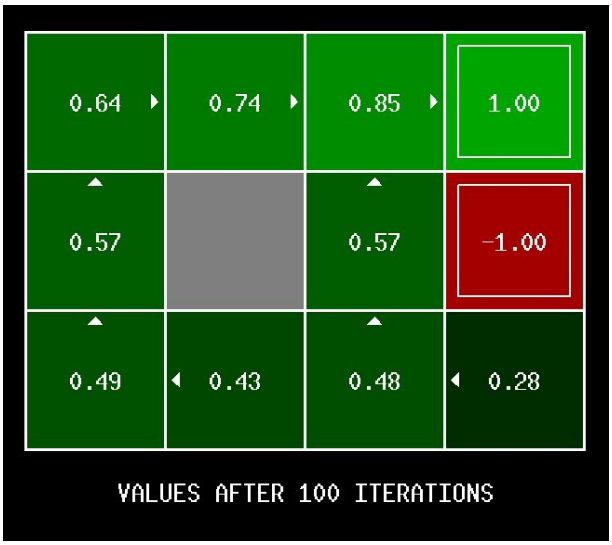
First 2 iterations.





For 5th iteration.





It converges.

2.

Varying discount shouldn’t affect as the overall path is same and we have one positive terminal state. We have to straight line.

vary discount

Discount = 0.5, 1

- Vary noise

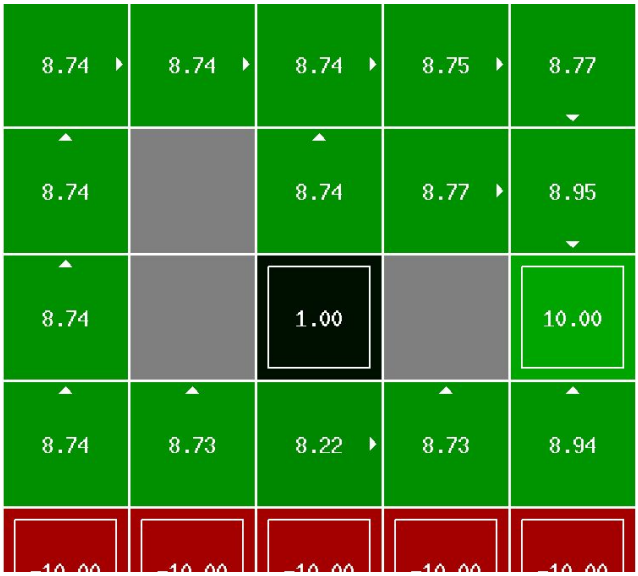
Noise = 0 , 0.1

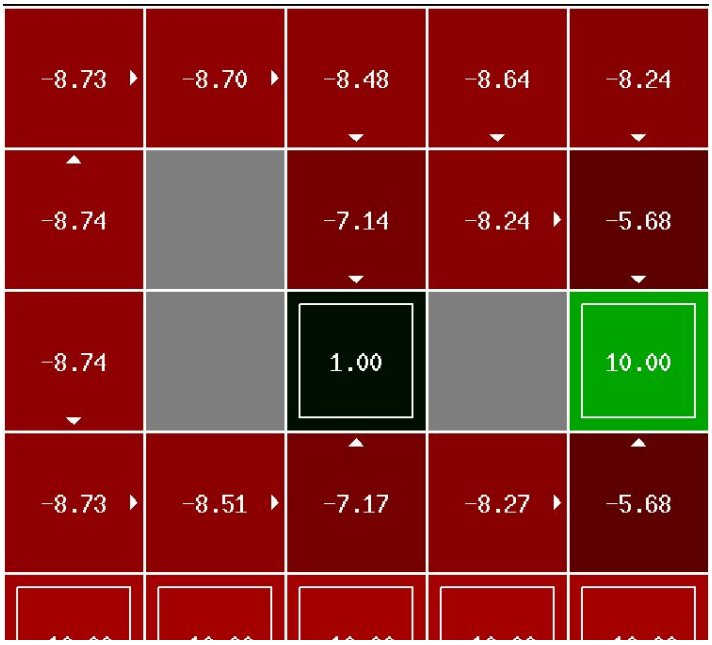
We must reduce the noise in order to reach our goal. By reducing the noise, the probability of going straight increases. So the agent will go straight without deviating its path to left or right.

Answer: Noise = 0, Discount = 0.9

3.

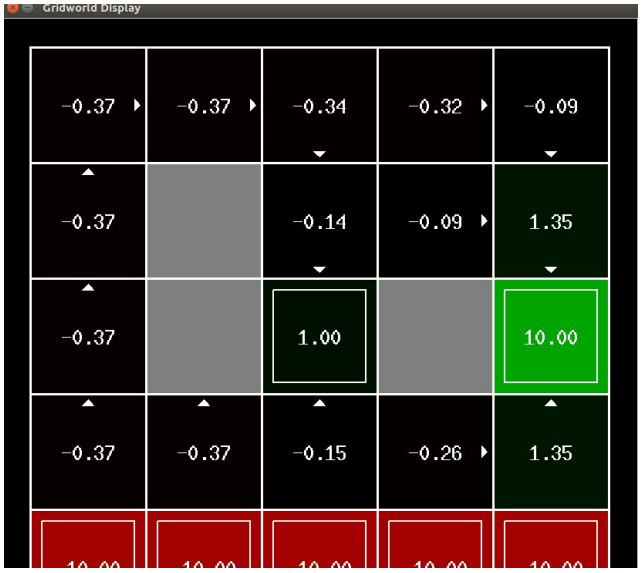
a.) Close exit: we will use small value of discount because distance is small. Living reward: small value because we want to go through smaller route near cliff.
noise should be very small, to avoid falling in cliff.



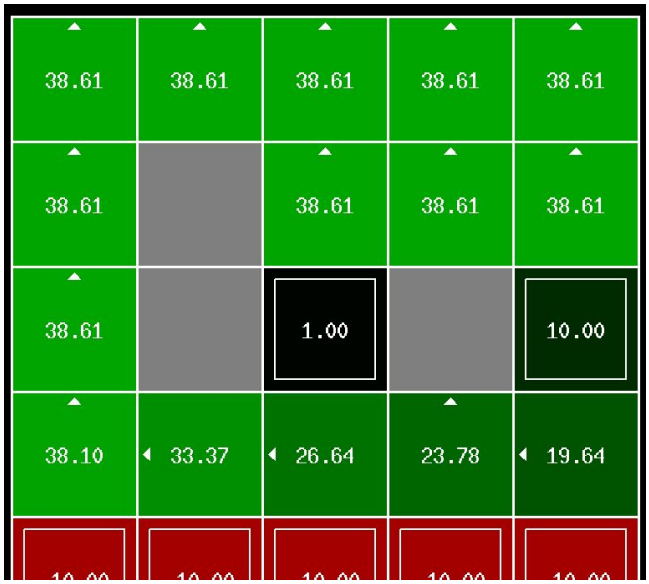


(0.199, 0.1,-7) => correct

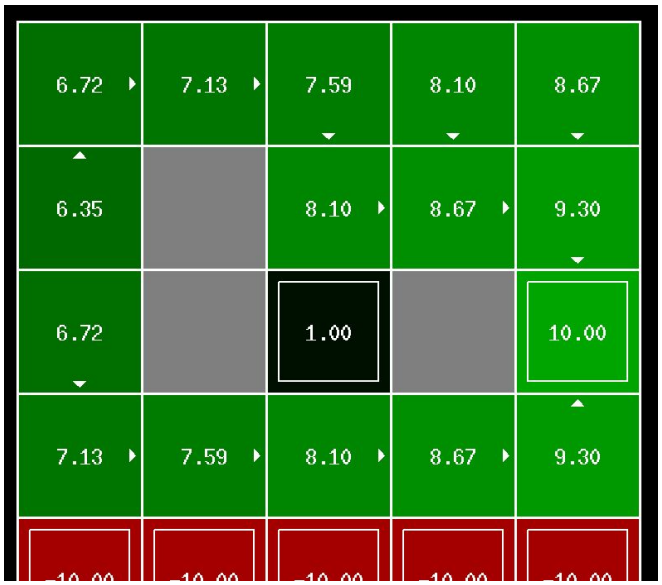
b.) We need to go north, therefore less negative reward.
Close exit is prefered therefore, discount. As there is no cliff, noise can be increased.



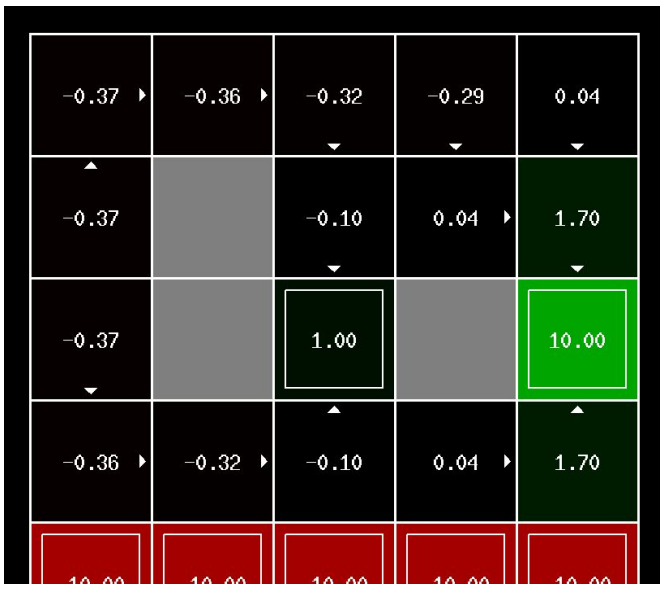
Correct => (0.199, 0.18,-0.3)



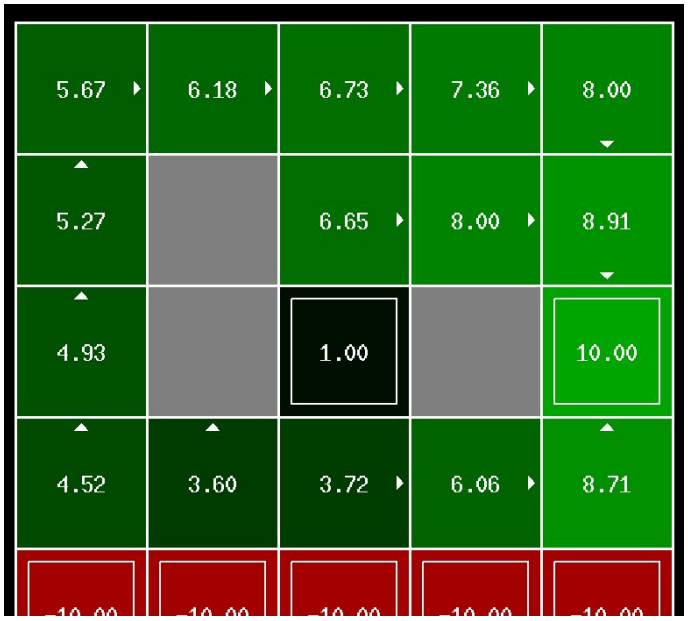
c.) (+10) therefore inc the discount. Risking the cliff, therefore greater living reward but lower noise.



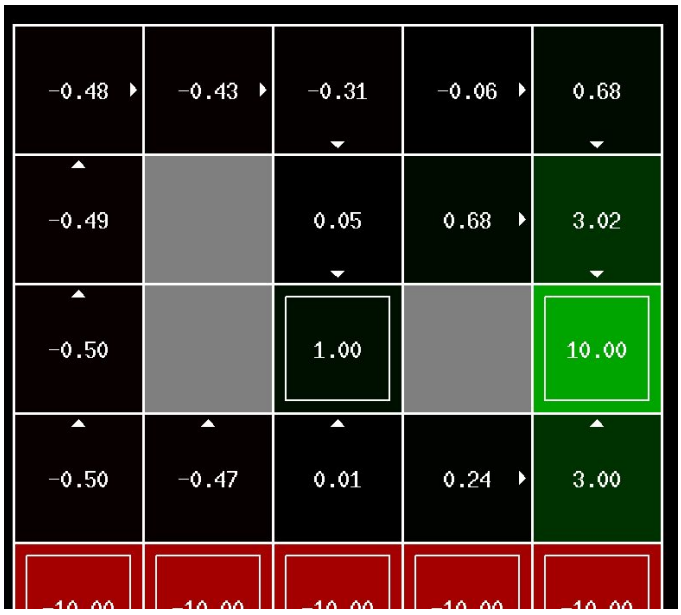
Correct => (0.9, 0, 0.3)



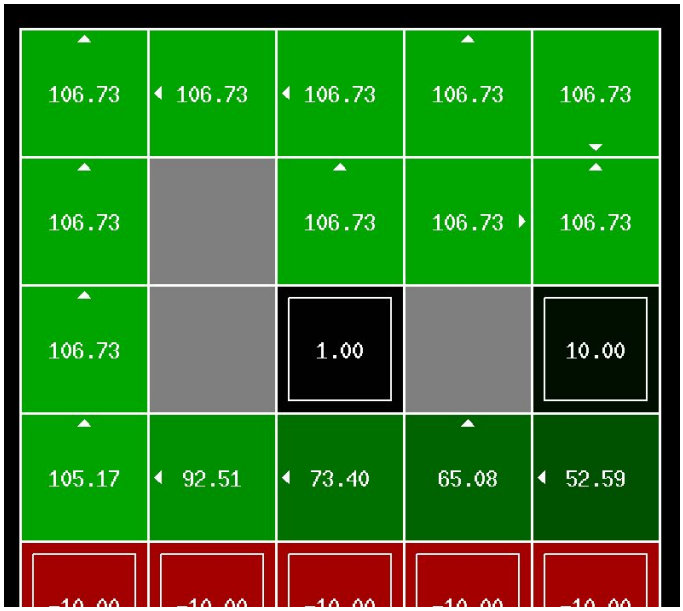
d.) (+10) exit, therefore keep the discount same as prev. We are avoiding the cliff here, so noise can be increased.



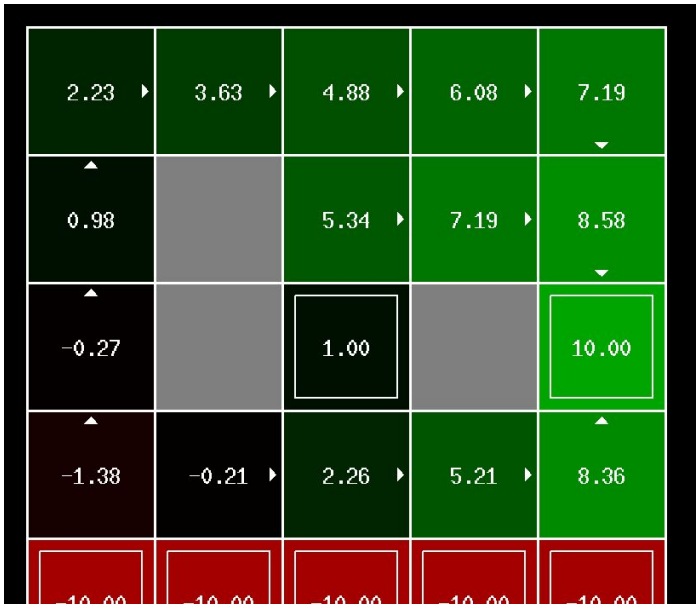
Correct => (0.89, 0.21, 0.3)



e.) It will remain stuck at top left corner, therefore never terminate.



Correct => (1, 0.2, 1)



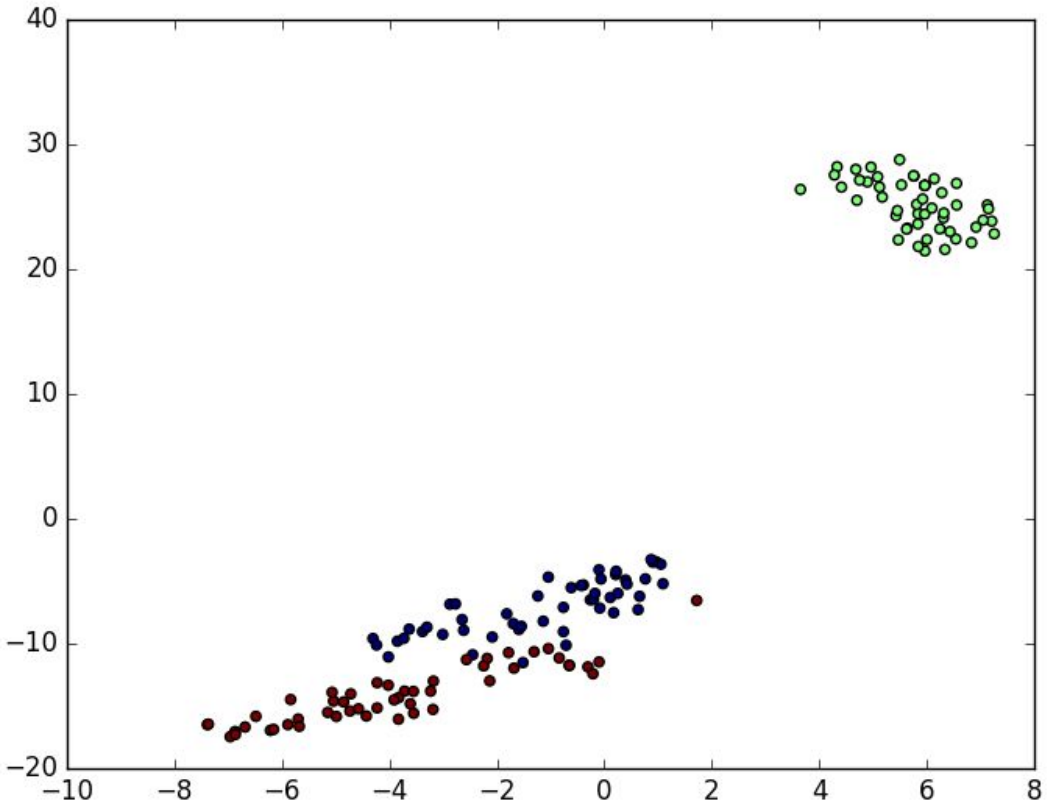
incorrect => (1, 0.2, -1)

QUES 2.

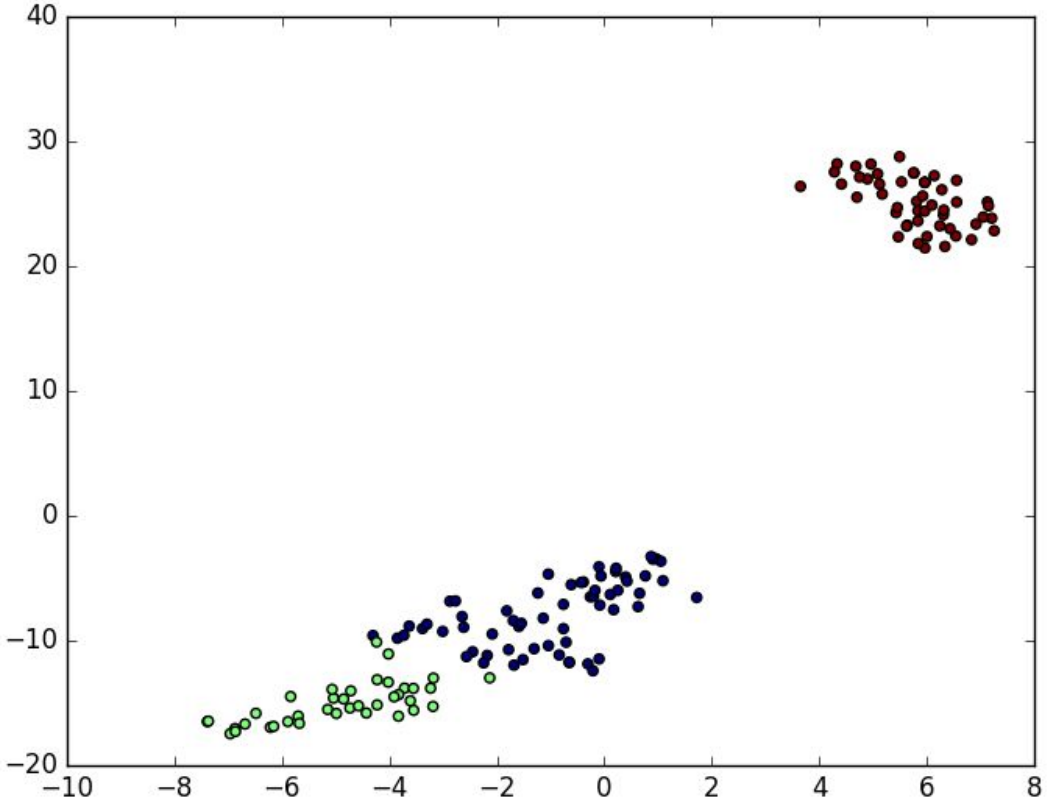
PLOTS:

IRIS

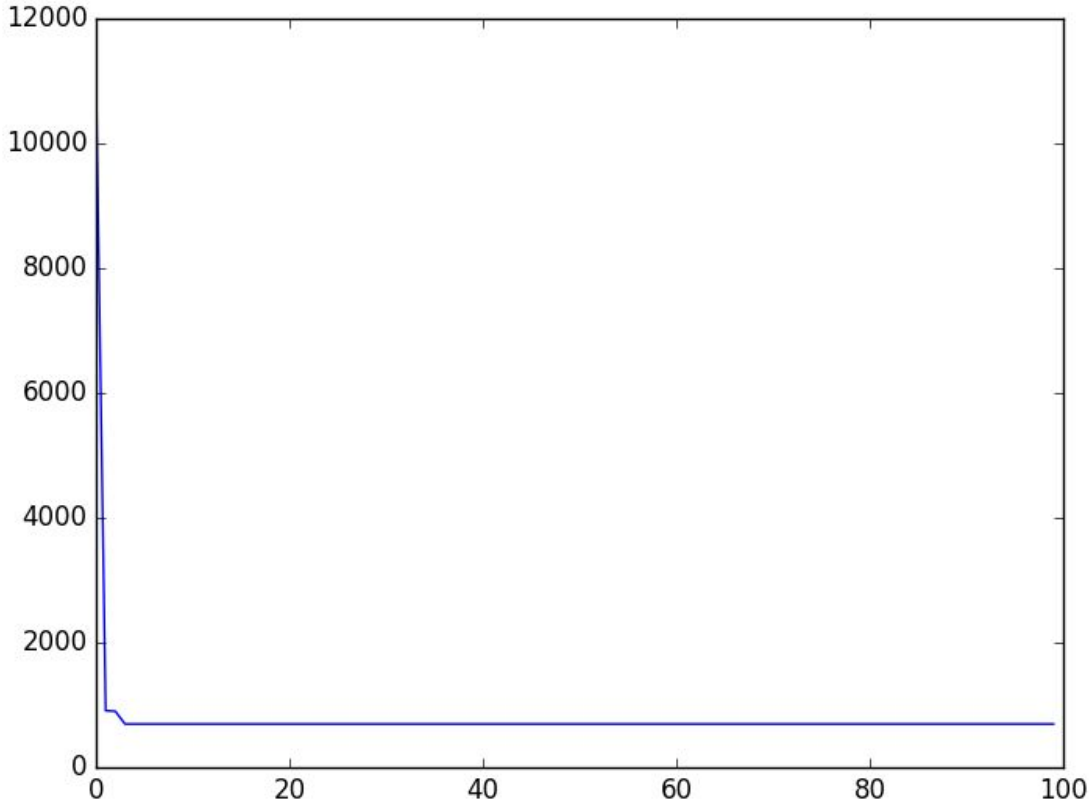
W/O K MEANS



WITH K MEANS

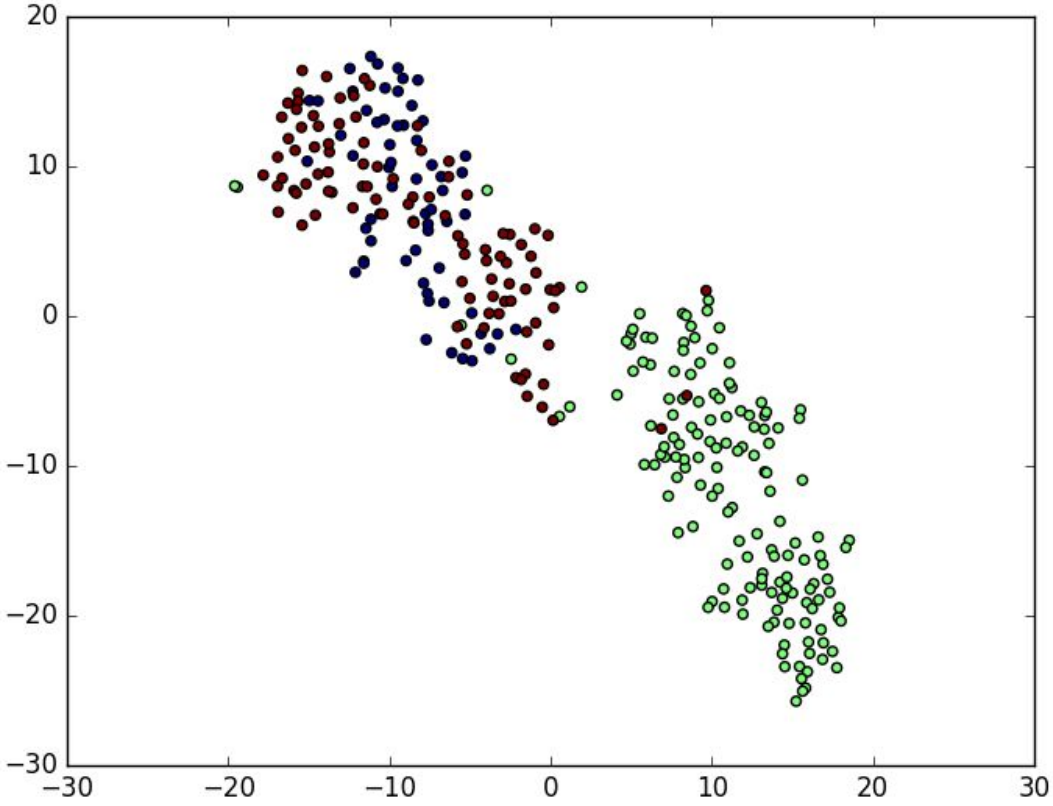


OBJ Fn - ITERATIONS

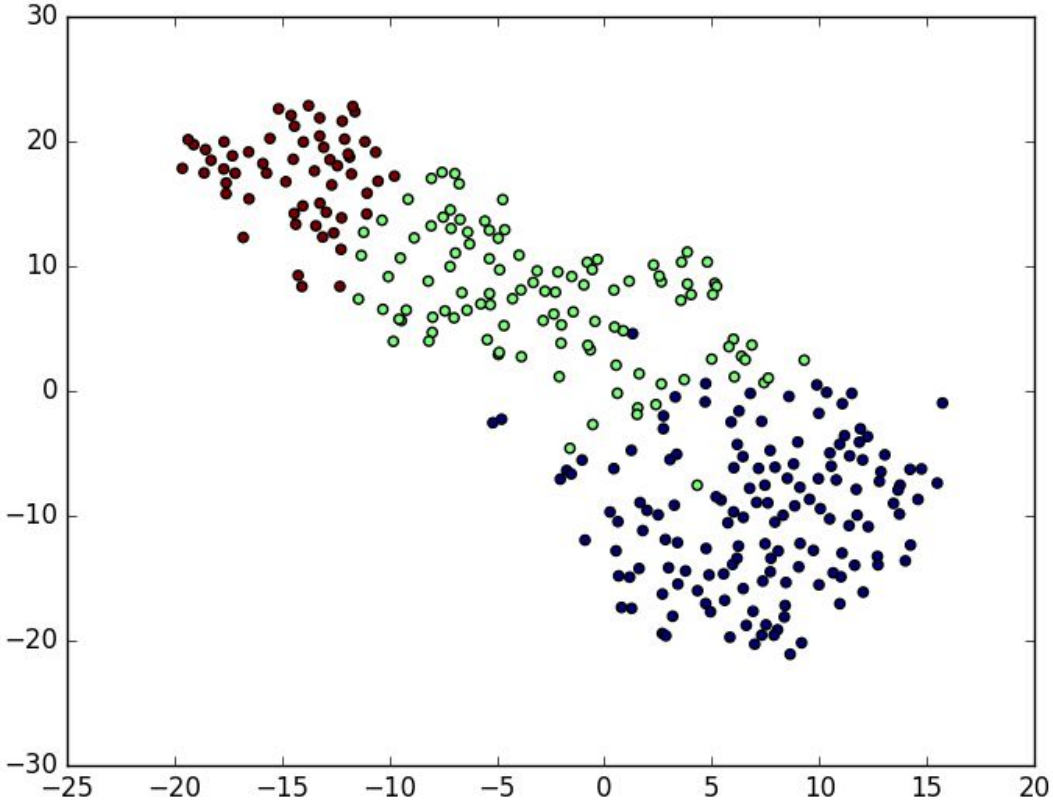


VERTEBRAL(COLUMN_3C)

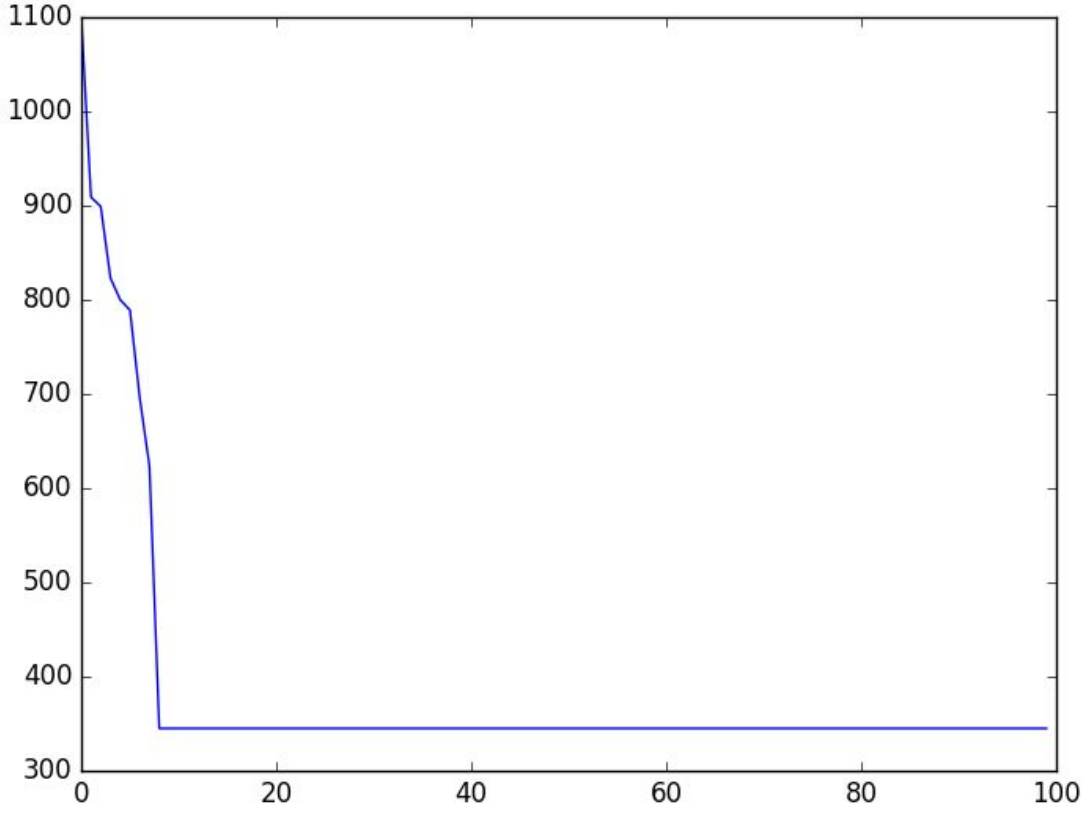
W/O K MEANS



WITH K MEANS

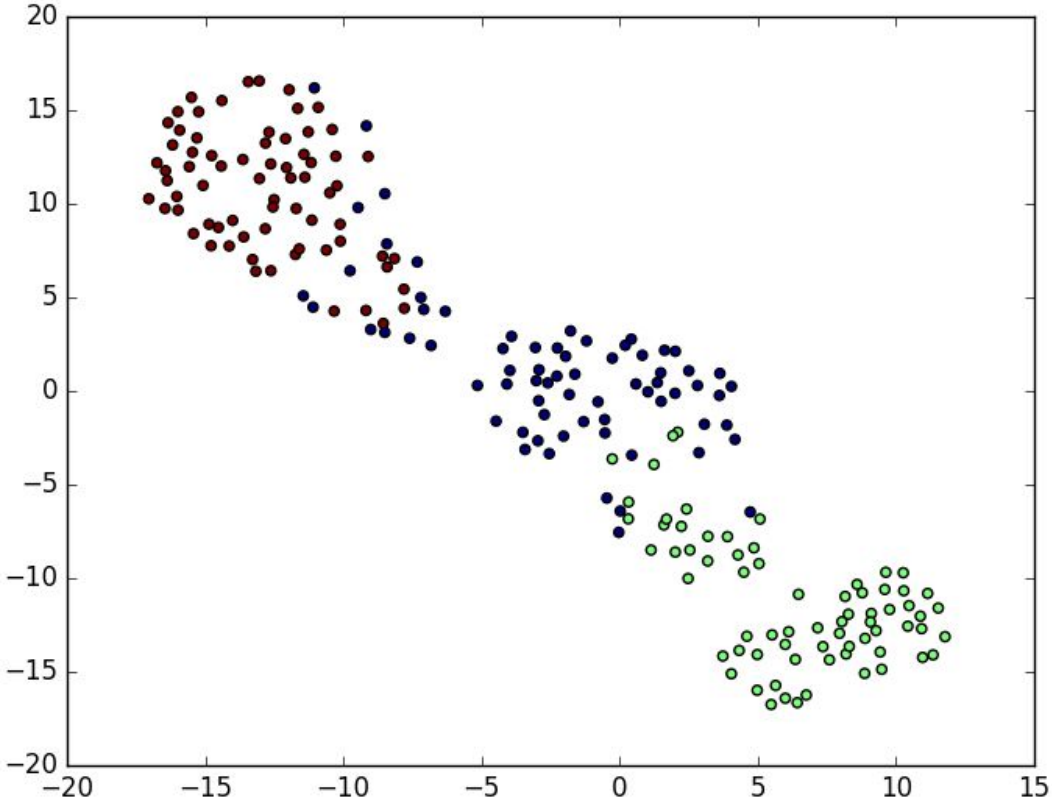


OBJ Fn - ITERATIONS

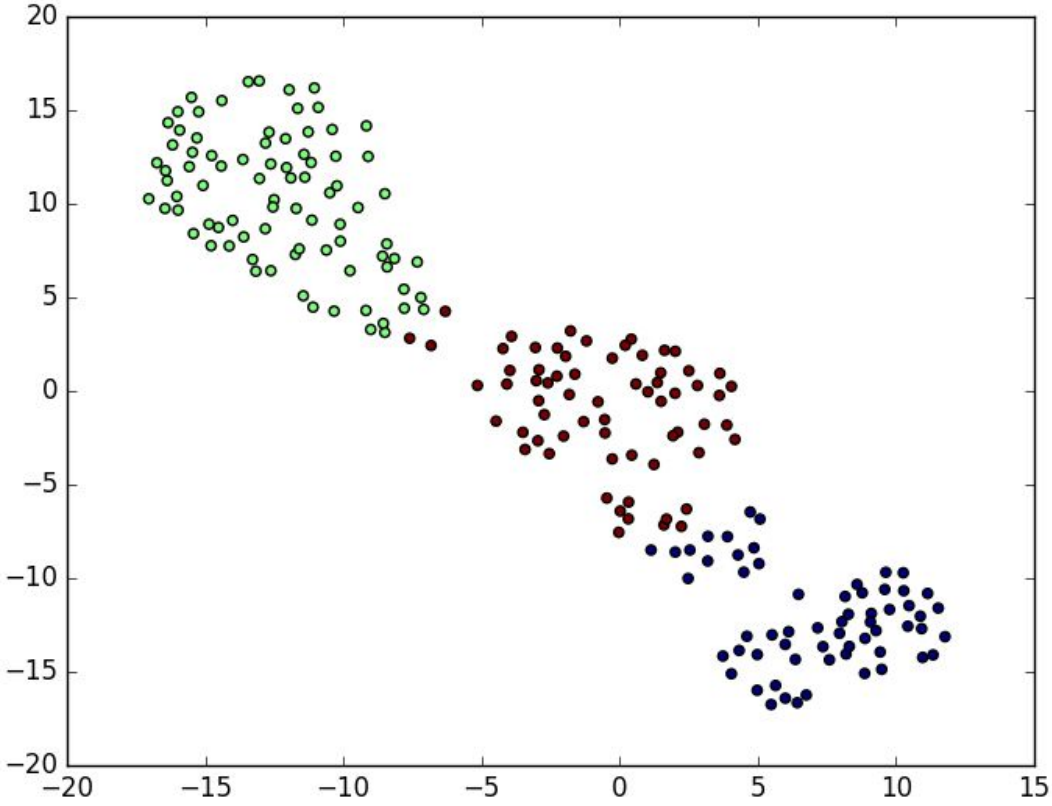


SEEDS DATASET

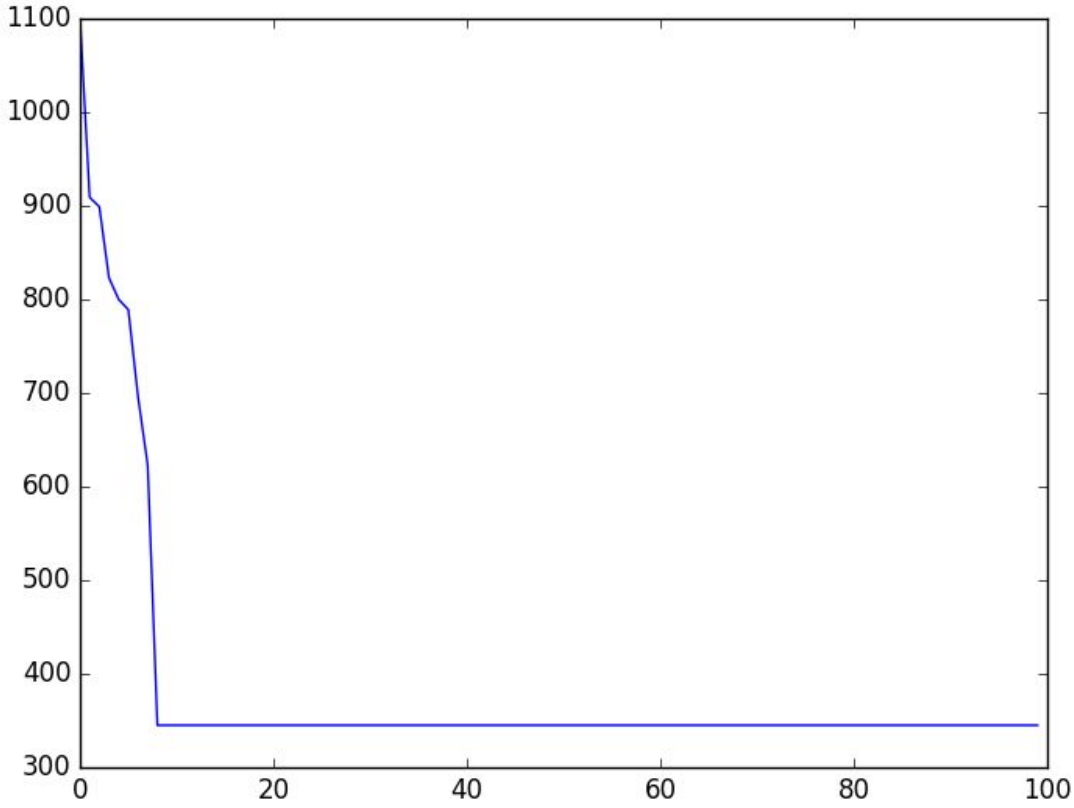
W/O K MEANS



WITH K MEANS

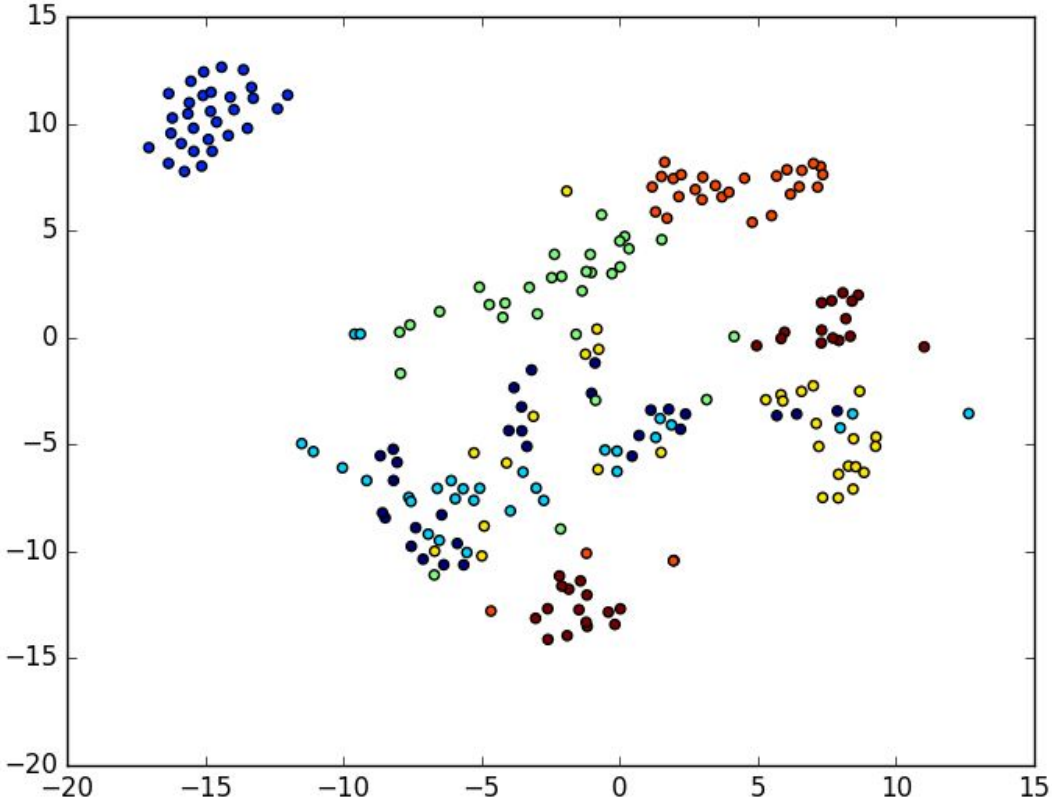


OBJ Fn - ITERATIONS

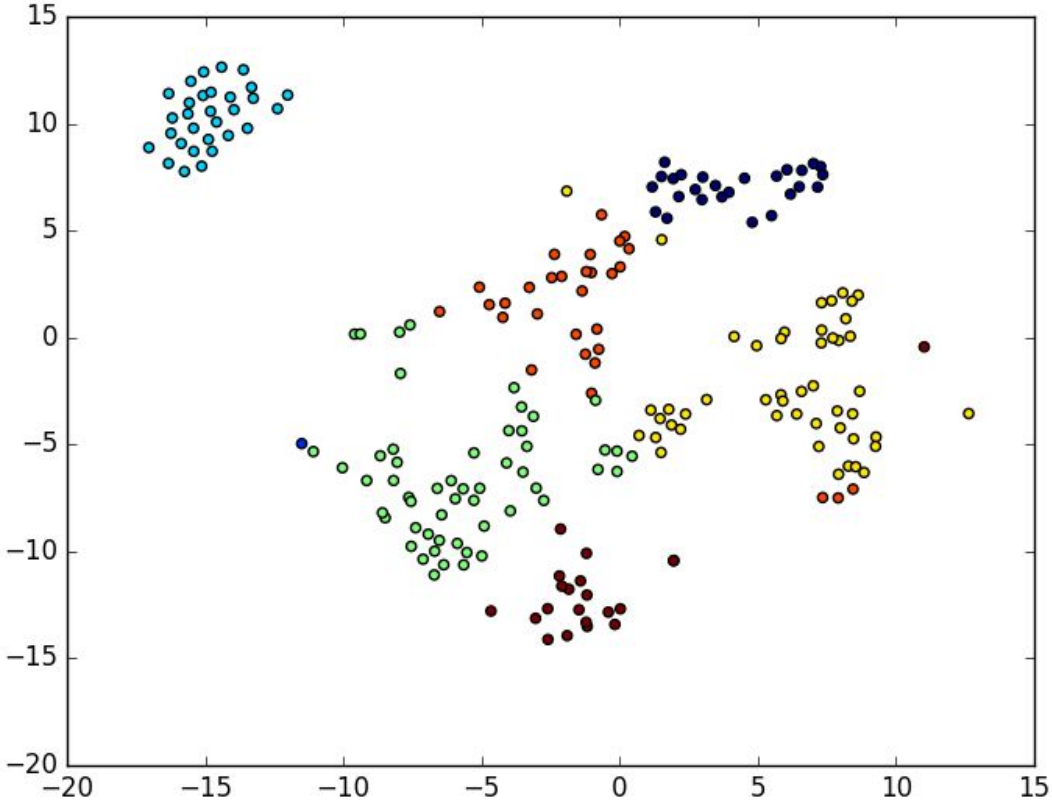


SEGMENTATION

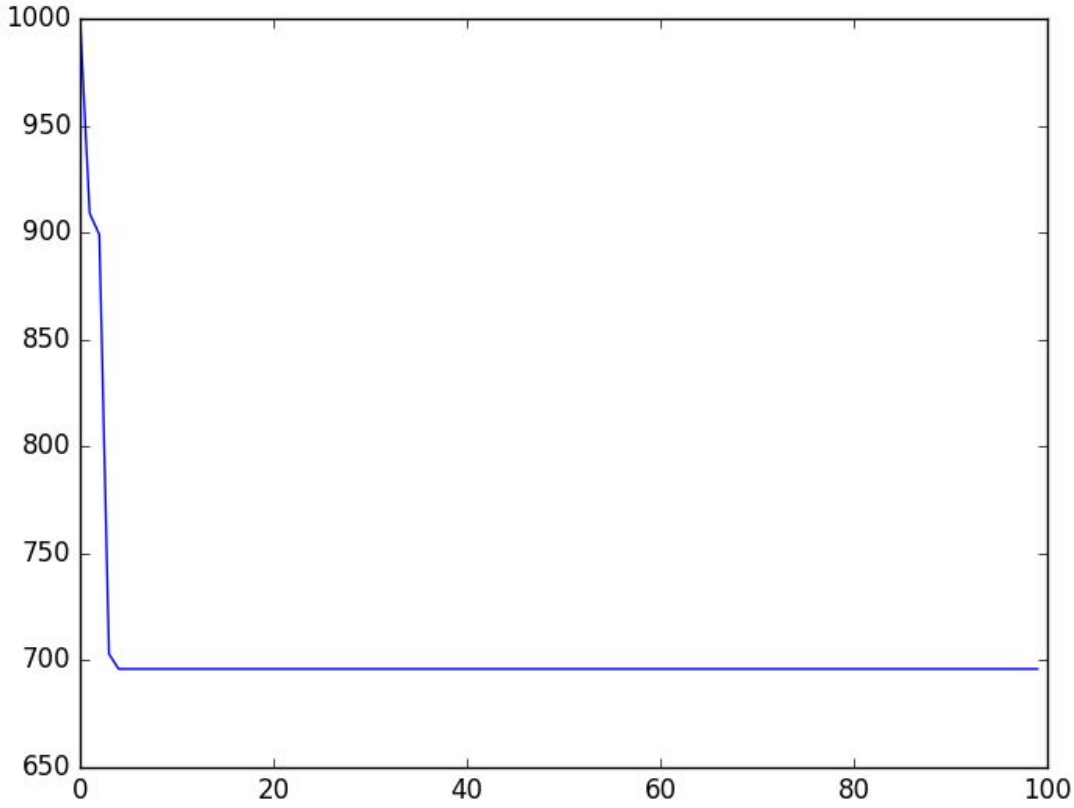
W/O K MEANS



WITH K MEANS



OBJ Fn - ITERATIONS



INFERENCE:

How good was the clustering for each dataset based on qualitative/visual metrics (tsne, graphs) :

On comparing the graphs after applying kmeans with the graphs we created w/o it, the clusters were formed in a similar manner and the division looked correct. Also, the value of K was chosen as truth value, the results were upto the mark.

TABLE:

DATA	K=2	K=2	K=2	K= T	K= T	K=T	K=12	K=12	K=12
	ARI	NMI	AMI	ARI	NMI	AMI	ARI	NMI	AMI
IRIS	0.548971320	0.6999557966	0.533599918	0.73071892874	0.770140990573	0.740636158	0.581968717562	0.687969282063	0.557388636884
SEGM.	0.093554621	0.389374912	0.173847445	0.10721`2798313	0.48827389723	0.21391387	0.041983982103	0.042982174012	0.102918739874
SEEDS	0.453971862	0.5445933934	0.428355481	0.699838030895	0.702982946297	0.697487658	0.329128014178	0.573865264236	0.3829724372469
VERT.	0.068921798	0.2478841221	0.178714781	0.2586477568	0.3371134245	0.332414621	0.1401966939	0.2837081749	0.2223270206

How good was the clustering for each dataset based on quantitative metrics (ARI, NMI, AMI)

The results were the best for k = truth value.

Consistency between qualitative and quantitative analysis

As in the graphs, best results were obtained when k= truth value was chosen and also, the qualitative and qualitative analysis were in sync.