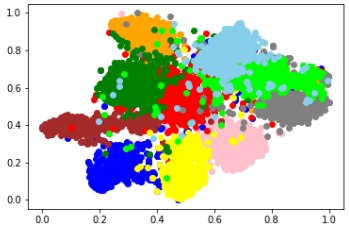
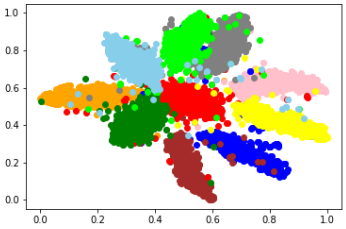
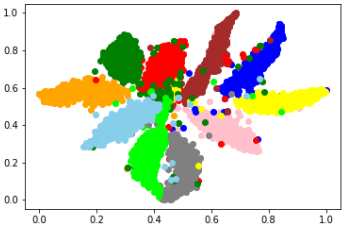
Q1.1:
Please make t-SNE plot the distribution of early, middle, final stage.
a. Evaluate the model on training dataset, collect features and labels
b. Make 3 t-SNE plots of the following training phase

Answer:

early stage N_epoch=50	middle stage N_epoch=200	final stage N_epoch=800
		

Q1.2:
Explain and analyze the distribution of features of three stages.
Hint: Is is a good feature extractor for classification task? Why or Why not?

Answer:
In the early stage, the distribution of features is formed. Despite each label still overlap with others, it is not difficult to observe that the features of each label close together to form a region. However, the boundary is not clear, regions either overlap with neighbors or connect to neighbors.

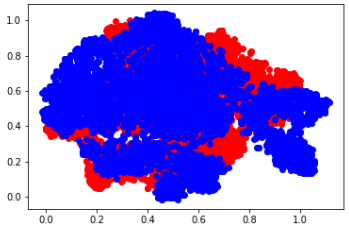
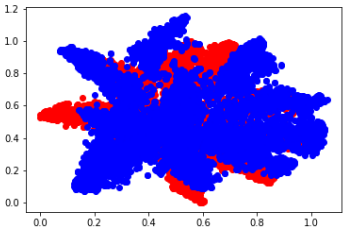
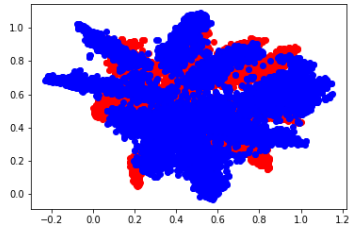
In the middle stage, the distribution of features is easy to observe. In this step, not only the features of each label close together to form a region, but also the boundary is very clear. But, some isolated points (single data) may occur in the region of other labels.

In the final stage, the distribution of features is fixed. Follow from the previous stage, the boundary of each region is very clear. We can easily draw the boundary. Also, the isolated points are no longer to occur in the region of other labels. (The probability is decreased rapidly)

It is a good feature extractor of classification task.
Because the boundary between labels is very clear and isolated. We successfully category the datas into ten regions, which correspond to the ten labels of ground truth.

Q2.1:
Please plot the distribution of early, middle, final stage.
Evaluate the model on source dataset and target dataset, collect feature and labels
Make 3 plots of the following training phase:
a. early stage
b. middle stage
c. final stage

Answer:

early stage N_epoch=50	middle stage N_epoch=200	final stage N_epoch=500
		

Q2.2:
Explain and analyze the distribution of features of three training phases.
Hint: Is is a good feature extractor for domain adaption task? Why or Why not?

Answer:
It is a good feature extractor for domain adaption task.
Despite the source dataset and target dataset is different, a good feature extractor will try to eliminate the difference of two domains. And, we can easily see that the features from two datasets are almost overlapping together in the final stage. As a result, we think it is a good feature extractor.

In the early stage, the features from two datasets is overlapping with large region, but not all. This is because of the similarity of two domains.

In the middle stage, the features from two datasets is trying to form the distribution. Moreover, during the process, the overlapping area is increasing.

In the final stage, two regions are almost overlapping together. The difference only happens in small region, which is seen as minor difference.