

```
C:\Users\adity\PycharmProjects\crux_round_3\venv\
Scripts\python.exe C:/Users/adity/PycharmProjects/
crux_round_3/semi_supervised_cnn_tf.py
2023-03-08 10:24:22.580697: I tensorflow/core/platform/
cpu_feature_guard.cc:193] This TensorFlow binary is
optimized with oneAPI Deep Neural Network Library (
oneDNN) to use the following CPU instructions in
performance-critical operations: AVX AVX2
To enable them in other operations, rebuild TensorFlow
with the appropriate compiler flags.
```

Search: Running Trial #1

Value	Best Value So Far	Hyperparameter
1024	?	units_1
1024	?	units_2
6.3843e-05	?	lr

Epoch 1/3

516/516 [=====] - 37s 68ms/  
step - loss: 4.4602 - acc: 0.0213

Epoch 2/3

516/516 [=====] - 31s 60ms/  
step - loss: 4.2521 - acc: 0.0367

Epoch 3/3

516/516 [=====] - 31s 60ms/  
step - loss: 4.1225 - acc: 0.0519

Trial 1 Complete [00h 01m 40s]

acc: 0.05193939432501793

Best acc So Far: 0.05193939432501793

Total elapsed time: 00h 01m 40s

Search: Running Trial #2

Value	Best Value So Far	Hyperparameter
4096	1024	units_1
1024	1024	units_2
1.0022e-05	6.3843e-05	lr

Epoch 1/3

```

516/516 [=====] - 53s 101ms/
step - loss: 4.6027 - acc: 0.0185
Epoch 2/3
516/516 [=====] - 53s 103ms/
step - loss: 4.4428 - acc: 0.0277
Epoch 3/3
516/516 [=====] - 54s 105ms/
step - loss: 4.3000 - acc: 0.0333
Trial 2 Complete [00h 02m 42s]
acc: 0.03333333507180214

```

```

Best acc So Far: 0.05193939432501793
Total elapsed time: 00h 04m 21s

```

Search: Running Trial #3

Value	Best Value So Far	Hyperparameter
4096	1024	units_1
1024	1024	units_2
0.00026186	6.3843e-05	lr

```

Epoch 1/3
516/516 [=====] - 51s 98ms/
step - loss: 4.4013 - acc: 0.0232
Epoch 2/3
516/516 [=====] - 51s 99ms/
step - loss: 4.1081 - acc: 0.0446
Epoch 3/3
516/516 [=====] - 50s 98ms/
step - loss: 3.9197 - acc: 0.0712
Trial 3 Complete [00h 02m 34s]
acc: 0.07121212035417557

```

```

Best acc So Far: 0.07121212035417557
Total elapsed time: 00h 06m 55s

```

Search: Running Trial #4

Value	Best Value So Far	Hyperparameter
4096	4096	units_1
1024	1024	units_2

```
0.0031743          |0.00026186          |lr
```

Epoch 1/3

```
516/516 [=====] - 51s 97ms/
```

```
step - loss: 4.6071 - acc: 0.0098
```

Epoch 2/3

```
516/516 [=====] - 50s 97ms/
```

```
step - loss: 4.6053 - acc: 0.0100
```

Epoch 3/3

```
516/516 [=====] - 50s 98ms/
```

```
step - loss: 4.6051 - acc: 0.0112
```

```
Trial 4 Complete [00h 02m 32s]
```

```
acc: 0.0112121207639575
```

```
Best acc So Far: 0.07121212035417557
```

```
Total elapsed time: 00h 09m 27s
```

Search: Running Trial #5

Value	Best Value So Far	Hyperparameter
4096	4096	units_1
2048	1024	units_2
0.00026437	0.00026186	lr

```
2023-03-08 10:33:50.608065: W tensorflow/tsl/framework/
cpu_allocator_impl.cc:82] Allocation of 33554432
exceeds 10% of free system memory.
```

```
2023-03-08 10:33:50.654692: W tensorflow/tsl/framework/
cpu_allocator_impl.cc:82] Allocation of 33554432
exceeds 10% of free system memory.
```

```
2023-03-08 10:33:50.659910: W tensorflow/tsl/framework/
cpu_allocator_impl.cc:82] Allocation of 33554432
exceeds 10% of free system memory.
```

Epoch 1/3

```
2023-03-08 10:33:50.997208: W tensorflow/tsl/framework/
cpu_allocator_impl.cc:82] Allocation of 33554432
exceeds 10% of free system memory.
```

```
2023-03-08 10:33:51.002465: W tensorflow/tsl/framework/
cpu_allocator_impl.cc:82] Allocation of 33554432
exceeds 10% of free system memory.
```

```
516/516 [=====] - 71s 135ms/
```

```

step - loss: 4.4174 - acc: 0.0227
Epoch 2/3
516/516 [=====] - 69s 134ms/
step - loss: 4.1454 - acc: 0.0424
Epoch 3/3
516/516 [=====] - 69s 133ms/
step - loss: 3.9267 - acc: 0.0702
Trial 5 Complete [00h 03m 30s]
acc: 0.07018181681632996

```

Best acc So Far: 0.07121212035417557

Total elapsed time: 00h 12m 57s

Model: "model\_1"

```

-----
-----
Layer (type)                Output Shape
Param #
=====
=====
input_2 (InputLayer)        [(None, 32, 32, 3)]
0

conv2d_5 (Conv2D)           (None, 16, 16, 64)
1792

max_pooling2d_4 (MaxPooling (None, 8, 8, 64)
0
2D
)

conv2d_6 (Conv2D)           (None, 4, 4, 128)
73856

conv2d_7 (Conv2D)           (None, 2, 2, 128)
147584

```

```
max_pooling2d_5 (MaxPooling (None, 1, 1, 128)
0
2D
)
```

```
conv2d_8 (Conv2D) (None, 1, 1, 256)
131328
```

```
max_pooling2d_6 (MaxPooling (None, 1, 1, 256)
0
2D
)
```

```
conv2d_9 (Conv2D) (None, 1, 1, 512)
524800
```

```
max_pooling2d_7 (MaxPooling (None, 1, 1, 512)
0
2D
)
```

```
flatten_1 (Flatten) (None, 512)
0
```

```
dense_3 (Dense) (None, 4096)
2101248
```

```
dense_4 (Dense) (None, 1024)
4195328
```

```
dense_5 (Dense)                (None, 100)
102500
```

```
=====
=====
```

```
Total params: 7,278,436
Trainable params: 7,278,436
Non-trainable params: 0
```

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```

```
-----
Epoch 1/7
```

```
258/258 [=====] - 37s 139ms/
step - loss: 4.4436 - acc: 0.0216 - val_loss: 4.2746 -
val_acc: 0.0339
```

```
Epoch 2/7
```

```
258/258 [=====] - 34s 133ms/
step - loss: 4.1648 - acc: 0.0433 - val_loss: 4.0657 -
val_acc: 0.0486
```

```
Epoch 3/7
```

```
258/258 [=====] - 35s 136ms/
step - loss: 3.9674 - acc: 0.0670 - val_loss: 3.9753 -
val_acc: 0.0676
```

```
Epoch 4/7
```

```
258/258 [=====] - 34s 131ms/
step - loss: 3.8278 - acc: 0.0853 - val_loss: 3.8150 -
val_acc: 0.0998
```

```
Epoch 5/7
```

```
258/258 [=====] - 34s 132ms/
step - loss: 3.7018 - acc: 0.1058 - val_loss: 3.6953 -
val_acc: 0.1094
```

```
Epoch 6/7
```

```
258/258 [=====] - 35s 135ms/
step - loss: 3.5963 - acc: 0.1200 - val_loss: 3.6551 -
val_acc: 0.1159
```

```
Epoch 7/7
```

```
258/258 [=====] - 34s 134ms/
step - loss: 3.4879 - acc: 0.1388 - val_loss: 3.5703 -
val_acc: 0.1360
```

```
1047/1047 [=====] - 9s 8ms/
```

```

step
Preds shape (33500, 100)
New datapoints added: (557, 32, 32, 3) (557, 100)
New size of labelled sets: (17057, 32, 32, 3) (17057,
100)
Epoch 1/7
267/267 [=====] - 36s 134ms/
step - loss: 3.2794 - acc: 0.1831 - val_loss: 3.5528 -
val_acc: 0.1437
Epoch 2/7
267/267 [=====] - 36s 134ms/
step - loss: 3.1759 - acc: 0.2024 - val_loss: 3.4591 -
val_acc: 0.1571
Epoch 3/7
267/267 [=====] - 35s 130ms/
step - loss: 3.0578 - acc: 0.2234 - val_loss: 3.4221 -
val_acc: 0.1694
Epoch 4/7
267/267 [=====] - 35s 132ms/
step - loss: 2.9478 - acc: 0.2408 - val_loss: 3.3878 -
val_acc: 0.1745
Epoch 5/7
267/267 [=====] - 35s 132ms/
step - loss: 2.8338 - acc: 0.2603 - val_loss: 3.4360 -
val_acc: 0.1828
Epoch 6/7
267/267 [=====] - 36s 134ms/
step - loss: 2.7262 - acc: 0.2850 - val_loss: 3.4122 -
val_acc: 0.1865
Epoch 7/7
267/267 [=====] - 35s 131ms/
step - loss: 2.6294 - acc: 0.3016 - val_loss: 3.5204 -
val_acc: 0.1958
1030/1030 [=====] - 8s 8ms/
step
Preds shape (32943, 100)
New datapoints added: (3931, 32, 32, 3) (3931, 100)
New size of labelled sets: (20988, 32, 32, 3) (20988,
100)
Epoch 1/7
328/328 [=====] - 43s 132ms/

```

```
step - loss: 2.1671 - acc: 0.4257 - val_loss: 3.5211 -
val_acc: 0.2007
```

```
Epoch 2/7
```

```
328/328 [=====] - ETA: 0s -
loss: 2.0680 - acc: 0.4493
```

```
Model stopped training due to drop in validation
accuracy
```

```
328/328 [=====] - 43s 132ms/
step - loss: 2.0680 - acc: 0.4493 - val_loss: 3.5887 -
val_acc: 0.1966
```

```
907/907 [=====] - 7s 8ms/step
Preds shape (29012, 100)
```

```
New datapoints added: (1637, 32, 32, 3) (1637, 100)
```

```
New size of labelled sets: (22625, 32, 32, 3) (22625,
100)
```

```
Epoch 1/7
```

```
354/354 [=====] - 47s 134ms/
step - loss: 1.8893 - acc: 0.4890 - val_loss: 3.6619 -
val_acc: 0.1992
```

```
Epoch 2/7
```

```
354/354 [=====] - 46s 131ms/
step - loss: 1.7994 - acc: 0.5084 - val_loss: 3.6892 -
val_acc: 0.2021
```

```
Epoch 3/7
```

```
354/354 [=====] - ETA: 0s -
loss: 1.6961 - acc: 0.5341
```

```
Model stopped training due to drop in validation
accuracy
```

```
354/354 [=====] - 46s 131ms/
step - loss: 1.6961 - acc: 0.5341 - val_loss: 3.8753 -
val_acc: 0.1967
```

```
856/856 [=====] - 7s 8ms/step
Preds shape (27375, 100)
```

```
New datapoints added: (1216, 32, 32, 3) (1216, 100)
```

```
New size of labelled sets: (23841, 32, 32, 3) (23841,
100)
```

```
Epoch 1/7
```

```
373/373 [=====] - 49s 130ms/
step - loss: 1.5969 - acc: 0.5566 - val_loss: 3.8348 -
val_acc: 0.2051
```

```
Epoch 2/7
```



```

373/373 [=====] - ETA: 0s -
loss: 1.5129 - acc: 0.5761
Model stopped training due to drop in validation
accuracy
373/373 [=====] - 50s 133ms/
step - loss: 1.5129 - acc: 0.5761 - val_loss: 4.0098 -
val_acc: 0.2043
818/818 [=====] - 6s 8ms/step
Preds shape (26159, 100)
New datapoints added: (725, 32, 32, 3) (725, 100)
New size of labelled sets: (24566, 32, 32, 3) (24566,
100)
Epoch 1/7
384/384 [=====] - 50s 130ms/
step - loss: 1.4184 - acc: 0.5996 - val_loss: 4.1733 -
val_acc: 0.2055
Epoch 2/7
384/384 [=====] - ETA: 0s -
loss: 1.3432 - acc: 0.6148
Model stopped training due to drop in validation
accuracy
384/384 [=====] - 50s 131ms/
step - loss: 1.3432 - acc: 0.6148 - val_loss: 4.3573 -
val_acc: 0.2050
795/795 [=====] - 6s 8ms/step
Preds shape (25434, 100)
New datapoints added: (1003, 32, 32, 3) (1003, 100)
New size of labelled sets: (25569, 32, 32, 3) (25569,
100)
Epoch 1/7
400/400 [=====] - 53s 131ms/
step - loss: 1.2575 - acc: 0.6378 - val_loss: 4.4864 -
val_acc: 0.2076
Epoch 2/7
400/400 [=====] - ETA: 0s -
loss: 1.1954 - acc: 0.6549
Model stopped training due to drop in validation
accuracy
400/400 [=====] - 52s 130ms/
step - loss: 1.1954 - acc: 0.6549 - val_loss: 4.6576 -
val_acc: 0.2049

```

```

764/764 [=====] - 6s 8ms/step
Preds shape (24431, 100)
New datapoints added: (831, 32, 32, 3) (831, 100)
New size of labelled sets: (26400, 32, 32, 3) (26400,
100)
Epoch 1/7
413/413 [=====] - ETA: 0s -
loss: 1.1221 - acc: 0.6702
  Model stopped training due to drop in validation
accuracy
413/413 [=====] - 54s 130ms/
step - loss: 1.1221 - acc: 0.6702 - val_loss: 4.8812 -
val_acc: 0.2032
738/738 [=====] - 6s 8ms/step
Preds shape (23600, 100)
New datapoints added: (1104, 32, 32, 3) (1104, 100)
New size of labelled sets: (27504, 32, 32, 3) (27504,
100)
Epoch 1/7
430/430 [=====] - ETA: 0s -
loss: 1.0593 - acc: 0.6881
  Model stopped training due to drop in validation
accuracy
430/430 [=====] - 56s 130ms/
step - loss: 1.0593 - acc: 0.6881 - val_loss: 5.0626 -
val_acc: 0.2037
703/703 [=====] - 5s 8ms/step
Preds shape (22496, 100)
New datapoints added: (1242, 32, 32, 3) (1242, 100)
New size of labelled sets: (28746, 32, 32, 3) (28746,
100)
Epoch 1/7
450/450 [=====] - 59s 130ms/
step - loss: 1.0070 - acc: 0.7023 - val_loss: 5.0898 -
val_acc: 0.2078
Epoch 2/7
450/450 [=====] - ETA: 0s -
loss: 0.9354 - acc: 0.7200
  Model stopped training due to drop in validation
accuracy
450/450 [=====] - 60s 134ms/

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step - loss: 0.9354 - acc: 0.7200 - val_loss: 5.4029 -
val_acc: 0.2014
665/665 [=====] - 6s 8ms/step
Preds shape (21254, 100)
New datapoints added: (1308, 32, 32, 3) (1308, 100)
New size of labelled sets: (30054, 32, 32, 3) (30054,
100)
Epoch 1/7
470/470 [=====] - ETA: 0s -
loss: 0.9023 - acc: 0.7337
  Model stopped training due to drop in validation
accuracy
470/470 [=====] - 61s 129ms/
step - loss: 0.9023 - acc: 0.7337 - val_loss: 5.2967 -
val_acc: 0.2020
624/624 [=====] - 5s 8ms/step
Preds shape (19946, 100)
New datapoints added: (1007, 32, 32, 3) (1007, 100)
New size of labelled sets: (31061, 32, 32, 3) (31061,
100)
Epoch 1/7
486/486 [=====] - ETA: 0s -
loss: 0.8443 - acc: 0.7466
  Model stopped training due to drop in validation
accuracy
486/486 [=====] - 63s 130ms/
step - loss: 0.8443 - acc: 0.7466 - val_loss: 5.8042 -
val_acc: 0.1993
592/592 [=====] - 5s 8ms/step
Preds shape (18939, 100)
New datapoints added: (1179, 32, 32, 3) (1179, 100)
New size of labelled sets: (32240, 32, 32, 3) (32240,
100)
Epoch 1/7
504/504 [=====] - 65s 129ms/
step - loss: 0.8063 - acc: 0.7561 - val_loss: 6.1637 -
val_acc: 0.2057
Epoch 2/7
504/504 [=====] - ETA: 0s -
loss: 0.7542 - acc: 0.7708
  Model stopped training due to drop in validation

```

```

accuracy
504/504 [=====] - 65s 129ms/
step - loss: 0.7542 - acc: 0.7708 - val_loss: 6.2655 -
val_acc: 0.2050
555/555 [=====] - 4s 8ms/step
Preds shape (17760, 100)
New datapoints added: (1501, 32, 32, 3) (1501, 100)
New size of labelled sets: (33741, 32, 32, 3) (33741,
100)
Epoch 1/7
528/528 [=====] - ETA: 0s -
loss: 0.7427 - acc: 0.7743
Model stopped training due to drop in validation
accuracy
528/528 [=====] - 69s 130ms/
step - loss: 0.7427 - acc: 0.7743 - val_loss: 6.3262 -
val_acc: 0.2009
509/509 [=====] - 4s 8ms/step
Preds shape (16259, 100)
New datapoints added: (1440, 32, 32, 3) (1440, 100)
New size of labelled sets: (35181, 32, 32, 3) (35181,
100)
Epoch 1/7
550/550 [=====] - 71s 129ms/
step - loss: 0.7206 - acc: 0.7805 - val_loss: 6.4304 -
val_acc: 0.2072
Epoch 2/7
550/550 [=====] - ETA: 0s -
loss: 0.6661 - acc: 0.7945
Model stopped training due to drop in validation
accuracy
550/550 [=====] - 71s 129ms/
step - loss: 0.6661 - acc: 0.7945 - val_loss: 6.6488 -
val_acc: 0.2029
464/464 [=====] - 4s 8ms/step
Preds shape (14819, 100)
New datapoints added: (1154, 32, 32, 3) (1154, 100)
New size of labelled sets: (36335, 32, 32, 3) (36335,
100)
Epoch 1/7
568/568 [=====] - ETA: 0s -

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```

loss: 0.6492 - acc: 0.8006
Model stopped training due to drop in validation
accuracy
568/568 [=====] - 73s 128ms/
step - loss: 0.6492 - acc: 0.8006 - val_loss: 6.9633 -
val_acc: 0.2017
428/428 [=====] - 3s 8ms/step
Preds shape (13665, 100)
New datapoints added: (1181, 32, 32, 3) (1181, 100)
New size of labelled sets: (37516, 32, 32, 3) (37516,
100)

```

Data plotted:

```

[0.02157575823366642, 0.043272726237773895, 0.
06703030318021774, 0.08527272939682007, 0.
10575757920742035, 0.11999999731779099, 0.
13884848356246948, 0.18309198319911957, 0.
20243887603282928, 0.22342732548713684, 0.
24078090488910675, 0.26030367612838745, 0.
28498563170433044, 0.3016356825828552, 0.
4256718158721924, 0.4492567181587219, 0.
48897236585617065, 0.5084198713302612, 0.
5340994596481323, 0.5565622448921204, 0.
5761083960533142, 0.5996499061584473, 0.
6148335337638855, 0.6378427147865295, 0.654855489730835
, 0.670189380645752, 0.6881181001663208, 0.
7022542357444763, 0.7200306057929993, 0.
7336793541908264, 0.7465953826904297, 0.756079375743866
, 0.7707816362380981, 0.7742509245872498, 0.
7804781198501587, 0.7945197820663452, 0.
8005779385566711]
[0.033900000154972076, 0.04859999939799309, 0.
067599999692440033, 0.0997999981045723, 0.
10939999669790268, 0.11590000241994858, 0.
13600000739097595, 0.1437000036239624, 0.
15710000693798065, 0.16940000653266907, 0.
1745000034570694, 0.18279999494552612, 0.
18649999797344208, 0.19580000638961792, 0.
20069999992847443, 0.19660000503063202, 0.
19920000433921814, 0.2020999938249588, 0.
19670000672340393, 0.20509999990463257, 0.

```

```
20430000126361847, 0.20550000667572021, 0.  
20499999821186066, 0.20759999752044678, 0.  
20489999651908875, 0.20319999754428864, 0.  
2037000060081482, 0.2078000009059906, 0.  
2013999968767166, 0.20200000703334808, 0.  
19930000603199005, 0.20569999516010284, 0.  
20499999821186066, 0.20090000331401825, 0.  
20720000565052032, 0.2029000073671341, 0.  
20170000195503235]  
range(1, 38)
```

Process finished with exit code 0