Epoch 1/10 - Train Loss: 0.5210, Train Acc: 0.8037, Val Loss: 0.5321, Val Acc: 0.8018, Val Macro-F1: 0.7947

Epoch 2/10 - Train Loss: 0.4131, Train Acc: 0.8494, Val Loss: 0.4256, Val Acc: 0.8442, Val Macro-F1: 0.8400

Epoch 3/10 - Train Loss: 0.3750, Train Acc: 0.8620, Val Loss: 0.3945, Val Acc: 0.8520, Val Macro-F1: 0.8494

Epoch 4/10 - Train Loss: 0.3490, Train Acc: 0.8714, Val Loss: 0.3717, Val Acc: 0.8625, Val Macro-F1: 0.8610

Epoch 5/10 - Train Loss: 0.3312, Train Acc: 0.8769, Val Loss: 0.3567, Val Acc: 0.8675, Val Macro-F1: 0.8662

Epoch 6/10 - Train Loss: 0.3150, Train Acc: 0.8827, Val Loss: 0.3438, Val Acc: 0.8733, Val Macro-F1: 0.8723

Epoch 7/10 - Train Loss: 0.3053, Train Acc: 0.8861, Val Loss: 0.3383, Val Acc: 0.8757, Val Macro-F1: 0.8746

Epoch 8/10 - Train Loss: 0.2918, Train Acc: 0.8919, Val Loss: 0.3279, Val Acc: 0.8813, Val Macro-F1: 0.8805

Epoch 9/10 - Train Loss: 0.2847, Train Acc: 0.8939, Val Loss: 0.3284, Val Acc: 0.8778, Val Macro-F1: 0.8768

Epoch 10/10 - Train Loss: 0.2781, Train Acc: 0.8968, Val Loss: 0.3286, Val Acc: 0.8785, Val Macro-F1: 0.8773

Epoch 1/10 - Train Loss: 0.4682, Train Acc: 0.8291, Val Loss: 0.4843, Val Acc: 0.8265, Val Macro-F1: 0.8208

Epoch 2/10 - Train Loss: 0.3892, Train Acc: 0.8565, Val Loss: 0.4061, Val Acc: 0.8515, Val Macro-F1: 0.8483

Epoch 3/10 - Train Loss: 0.3506, Train Acc: 0.8712, Val Loss: 0.3739, Val Acc: 0.8622, Val Macro-F1: 0.8605

Epoch 4/10 - Train Loss: 0.3281, Train Acc: 0.8792, Val Loss: 0.3572, Val Acc: 0.8697, Val Macro-F1: 0.8683

Epoch 5/10 - Train Loss: 0.3063, Train Acc: 0.8865, Val Loss: 0.3406, Val Acc: 0.8787, Val Macro-F1: 0.8778

Epoch 6/10 - Train Loss: 0.2910, Train Acc: 0.8926, Val Loss: 0.3316, Val Acc: 0.8787, Val Macro-F1: 0.8776

Epoch 7/10 - Train Loss: 0.2783, Train Acc: 0.8970, Val Loss: 0.3209, Val Acc: 0.8858, Val Macro-F1: 0.8847

Epoch 8/10 - Train Loss: 0.2652, Train Acc: 0.9017, Val Loss: 0.3136, Val Acc: 0.8887, Val Macro-F1: 0.8878

Epoch 9/10 - Train Loss: 0.2628, Train Acc: 0.9018, Val Loss: 0.3186, Val Acc: 0.8877, Val Macro-F1: 0.8867

Epoch 10/10 - Train Loss: 0.2512, Train Acc: 0.9066, Val Loss: 0.3131, Val Acc: 0.8912, Val Macro-F1: 0.8903

Epoch 1/10 - Train Loss: 0.5549, Train Acc: 0.7972, Val Loss: 0.5674, Val Acc: 0.7960, Val Macro-F1: 0.7916

Epoch 2/10 - Train Loss: 0.4215, Train Acc: 0.8464, Val Loss: 0.4352, Val Acc: 0.8410, Val Macro-F1: 0.8377

Epoch 3/10 - Train Loss: 0.3670, Train Acc: 0.8664, Val Loss: 0.3826, Val Acc: 0.8572, Val Macro-F1: 0.8556

Epoch 4/10 - Train Loss: 0.3390, Train Acc: 0.8757, Val Loss: 0.3584, Val Acc: 0.8662, Val Macro-F1: 0.8650

Epoch 5/10 - Train Loss: 0.3172, Train Acc: 0.8828, Val Loss: 0.3417, Val Acc: 0.8770, Val Macro-F1: 0.8762

Epoch 6/10 - Train Loss: 0.3022, Train Acc: 0.8878, Val Loss: 0.3329, Val Acc: 0.8775, Val Macro-F1: 0.8768

Epoch 7/10 - Train Loss: 0.2873, Train Acc: 0.8939, Val Loss: 0.3222, Val Acc: 0.8828, Val Macro-F1: 0.8820

Epoch 8/10 - Train Loss: 0.2717, Train Acc: 0.9000, Val Loss: 0.3125, Val Acc: 0.8873, Val Macro-F1: 0.8867

Epoch 9/10 - Train Loss: 0.2614, Train Acc: 0.9036, Val Loss: 0.3091, Val Acc: 0.8897, Val Macro-F1: 0.8889

Epoch 10/10 - Train Loss: 0.2532, Train Acc: 0.9064, Val Loss: 0.3075, Val Acc: 0.8915, Val Macro-F1: 0.8909

Epoch 1/10 - Train Loss: 0.2531, Train Acc: 0.9056, Val Loss: 0.3032, Val Acc: 0.8898, Val Macro-F1: 0.8893

Epoch 2/10 - Train Loss: 0.2492, Train Acc: 0.9069, Val Loss: 0.3019, Val Acc: 0.8902, Val Macro-F1: 0.8896

Epoch 3/10 - Train Loss: 0.2460, Train Acc: 0.9081, Val Loss: 0.3013, Val Acc: 0.8902, Val Macro-F1: 0.8896

Epoch 4/10 - Train Loss: 0.2429, Train Acc: 0.9094, Val Loss: 0.3007, Val Acc: 0.8903, Val Macro-F1: 0.8897

Epoch 5/10 - Train Loss: 0.2400, Train Acc: 0.9107, Val Loss: 0.3002, Val Acc: 0.8915, Val Macro-F1: 0.8909

Epoch 6/10 - Train Loss: 0.2372, Train Acc: 0.9116, Val Loss: 0.3001, Val Acc: 0.8920, Val Macro-F1: 0.8913

Epoch 7/10 - Train Loss: 0.2347, Train Acc: 0.9124, Val Loss: 0.3004, Val Acc: 0.8920, Val Macro-F1: 0.8913

Epoch 8/10 - Train Loss: 0.2323, Train Acc: 0.9132, Val Loss: 0.3003, Val Acc: 0.8918, Val Macro-F1: 0.8911

Epoch 9/10 - Train Loss: 0.2297, Train Acc: 0.9141, Val Loss: 0.3004, Val Acc: 0.8917, Val Macro-F1: 0.8909

Epoch 10/10 - Train Loss: 0.2276, Train Acc: 0.9147, Val Loss: 0.3006, Val Acc: 0.8913, Val Macro-F1: 0.8905

Epoch 1/10 - Train Loss: 0.2206, Train Acc: 0.9174, Val Loss: 0.2899, Val Acc: 0.8965, Val Macro-F1: 0.8960

Epoch 2/10 - Train Loss: 0.2152, Train Acc: 0.9197, Val Loss: 0.2894, Val Acc: 0.8978, Val Macro-F1: 0.8973

Epoch 3/10 - Train Loss: 0.2105, Train Acc: 0.9215, Val Loss: 0.2886, Val Acc: 0.8963, Val Macro-F1: 0.8957

Epoch 4/10 - Train Loss: 0.2065, Train Acc: 0.9231, Val Loss: 0.2892, Val Acc: 0.8973, Val Macro-F1: 0.8967

Epoch 5/10 - Train Loss: 0.2031, Train Acc: 0.9244, Val Loss: 0.2900, Val Acc: 0.8973, Val Macro-F1: 0.8968

Epoch 6/10 - Train Loss: 0.1998, Train Acc: 0.9256, Val Loss: 0.2903, Val Acc: 0.8977, Val Macro-F1: 0.8971

Epoch 7/10 - Train Loss: 0.1965, Train Acc: 0.9270, Val Loss: 0.2910, Val Acc: 0.8965, Val Macro-F1: 0.8959

Epoch 8/10 - Train Loss: 0.1937, Train Acc: 0.9279, Val Loss: 0.2919, Val Acc: 0.8963, Val Macro-F1: 0.8957

Epoch 9/10 - Train Loss: 0.1909, Train Acc: 0.9289, Val Loss: 0.2928, Val Acc: 0.8967, Val Macro-F1: 0.8961

Epoch 10/10 - Train Loss: 0.1882, Train Acc: 0.9299, Val Loss: 0.2941, Val Acc: 0.8970, Val Macro-F1: 0.8963

Epoch 1/10 - Train Loss: 0.2288, Train Acc: 0.9145, Val Loss: 0.2912, Val Acc: 0.8937, Val Macro-F1: 0.8931

Epoch 2/10 - Train Loss: 0.2239, Train Acc: 0.9159, Val Loss: 0.2909, Val Acc: 0.8938, Val Macro-F1: 0.8933

Epoch 3/10 - Train Loss: 0.2199, Train Acc: 0.9175, Val Loss: 0.2902, Val Acc: 0.8932, Val Macro-F1: 0.8925

Epoch 4/10 - Train Loss: 0.2158, Train Acc: 0.9190, Val Loss: 0.2895, Val Acc: 0.8937, Val Macro-F1: 0.8930

Epoch 5/10 - Train Loss: 0.2121, Train Acc: 0.9206, Val Loss: 0.2891, Val Acc: 0.8940, Val Macro-F1: 0.8933

Epoch 6/10 - Train Loss: 0.2090, Train Acc: 0.9215, Val Loss: 0.2894, Val Acc: 0.8943, Val Macro-F1: 0.8936

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Epoch 9/10 - Train Loss: 0.1989, Train Acc: 0.9257, Val Loss: 0.2895, Val Acc: 0.8972, Val Macro-F1: 0.8964

Epoch 10/10 - Train Loss: 0.1959, Train Acc: 0.9268, Val Loss: 0.2902, Val Acc: 0.8963, Val Macro-F1: 0.8955

Epoch 1/10 - Train Loss: 0.2235, Train Acc: 0.9166, Val Loss: 0.2982, Val Acc: 0.8947, Val Macro-F1: 0.8938

Epoch 2/10 - Train Loss: 0.2221, Train Acc: 0.9171, Val Loss: 0.2983, Val Acc: 0.8958, Val Macro-F1: 0.8949

Epoch 3/10 - Train Loss: 0.2209, Train Acc: 0.9173, Val Loss: 0.2986, Val Acc: 0.8953, Val Macro-F1: 0.8944

Epoch 4/10 - Train Loss: 0.2196, Train Acc: 0.9178, Val Loss: 0.2986, Val Acc: 0.8957, Val Macro-F1: 0.8947

Epoch 5/10 - Train Loss: 0.2183, Train Acc: 0.9183, Val Loss: 0.2988, Val Acc: 0.8958, Val Macro-F1: 0.8949

Epoch 6/10 - Train Loss: 0.2168, Train Acc: 0.9191, Val Loss: 0.2990, Val Acc: 0.8955, Val Macro-F1: 0.8946

Epoch 7/10 - Train Loss: 0.2156, Train Acc: 0.9194, Val Loss: 0.2992, Val Acc: 0.8960, Val Macro-F1: 0.8951

Epoch 8/10 - Train Loss: 0.2144, Train Acc: 0.9201, Val Loss: 0.2997, Val Acc: 0.8953, Val Macro-F1: 0.8944

Epoch 9/10 - Train Loss: 0.2130, Train Acc: 0.9205, Val Loss: 0.2999, Val Acc: 0.8953, Val Macro-F1: 0.8945

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Epoch 4/10 - Train Loss: 0.1792, Train Acc: 0.9334, Val Loss: 0.2976, Val Acc: 0.8972, Val Macro-F1: 0.8964

Epoch 5/10 - Train Loss: 0.1776, Train Acc: 0.9340, Val Loss: 0.2985, Val Acc: 0.8972, Val Macro-F1: 0.8964

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Epoch 10/10 - Train Loss: 0.1755, Train Acc: 0.9350, Val Loss: 0.2916, Val Acc: 0.9000, Val Macro-F1: 0.8992

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Epoch 6/10 - Train Loss: 0.2066, Train Acc: 0.9231, Val Loss: 0.2972, Val Acc: 0.8935, Val Macro-F1: 0.8927

Epoch 7/10 - Train Loss: 0.2063, Train Acc: 0.9232, Val Loss: 0.2973, Val Acc: 0.8935, Val Macro-F1: 0.8927

Epoch 8/10 - Train Loss: 0.2060, Train Acc: 0.9233, Val Loss: 0.2973, Val Acc: 0.8935, Val Macro-F1: 0.8927

Epoch 9/10 - Train Loss: 0.2057, Train Acc: 0.9233, Val Loss: 0.2973, Val Acc: 0.8933, Val Macro-F1: 0.8926

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Epoch 4/10 - Train Loss: 0.1655, Train Acc: 0.9386, Val Loss: 0.3034, Val Acc: 0.8943, Val Macro-F1: 0.8936

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Epoch 8/10 - Train Loss: 0.1640, Train Acc: 0.9391, Val Loss: 0.3046, Val Acc: 0.8937, Val Macro-F1: 0.8929

Epoch 9/10 - Train Loss: 0.1637, Train Acc: 0.9392, Val Loss: 0.3049, Val Acc: 0.8938, Val Macro-F1: 0.8931

Epoch 10/10 - Train Loss: 0.1633, Train Acc: 0.9393, Val Loss: 0.3052, Val Acc: 0.8937, Val Macro-F1: 0.8929

Epoch 1/10 - Train Loss: 0.1726, Train Acc: 0.9359, Val Loss: 0.2895, Val Acc: 0.8992, Val Macro-F1: 0.8983

Epoch 2/10 - Train Loss: 0.1721, Train Acc: 0.9361, Val Loss: 0.2895, Val Acc: 0.8978, Val Macro-F1: 0.8970

Epoch 3/10 - Train Loss: 0.1717, Train Acc: 0.9364, Val Loss: 0.2896, Val Acc: 0.8980, Val Macro-F1: 0.8971

Epoch 4/10 - Train Loss: 0.1712, Train Acc: 0.9364, Val Loss: 0.2897, Val Acc: 0.8980, Val Macro-F1: 0.8971

Epoch 5/10 - Train Loss: 0.1708, Train Acc: 0.9365, Val Loss: 0.2899, Val Acc: 0.8977, Val Macro-F1: 0.8968

Epoch 6/10 - Train Loss: 0.1704, Train Acc: 0.9367, Val Loss: 0.2900, Val Acc: 0.8975, Val Macro-F1: 0.8966

Epoch 7/10 - Train Loss: 0.1701, Train Acc: 0.9369, Val Loss: 0.2901, Val Acc: 0.8975, Val Macro-F1: 0.8966

Epoch 8/10 - Train Loss: 0.1697, Train Acc: 0.9371, Val Loss: 0.2903, Val Acc: 0.8977, Val Macro-F1: 0.8968

Epoch 9/10 - Train Loss: 0.1693, Train Acc: 0.9372, Val Loss: 0.2904, Val Acc: 0.8972, Val Macro-F1: 0.8962

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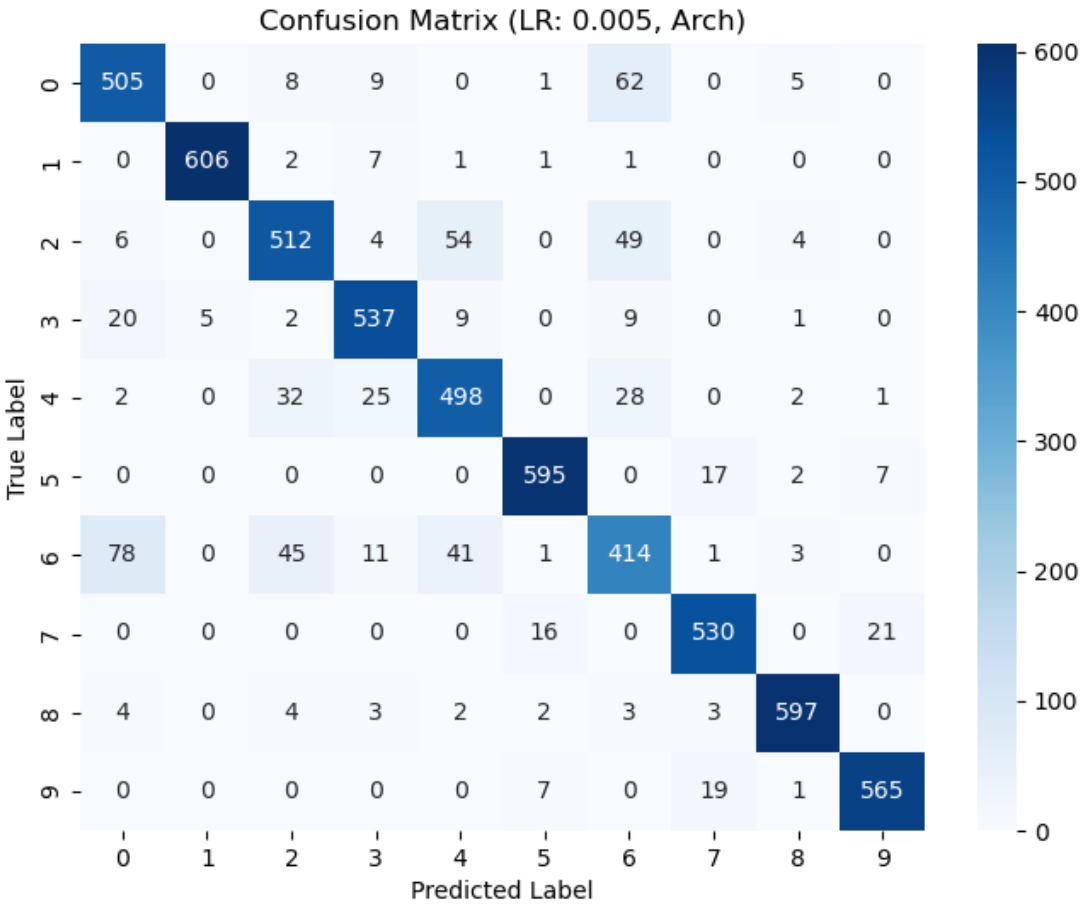
Confusion Matrix (LR: 0.005, Arch)
True Label
Predicted Label
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4 2 0 32 25 498 0 28 0 2 1
5 0 0 0 0 0 595 0 17 2 7
6 78 0 45 11 41 1 414 1 3 0
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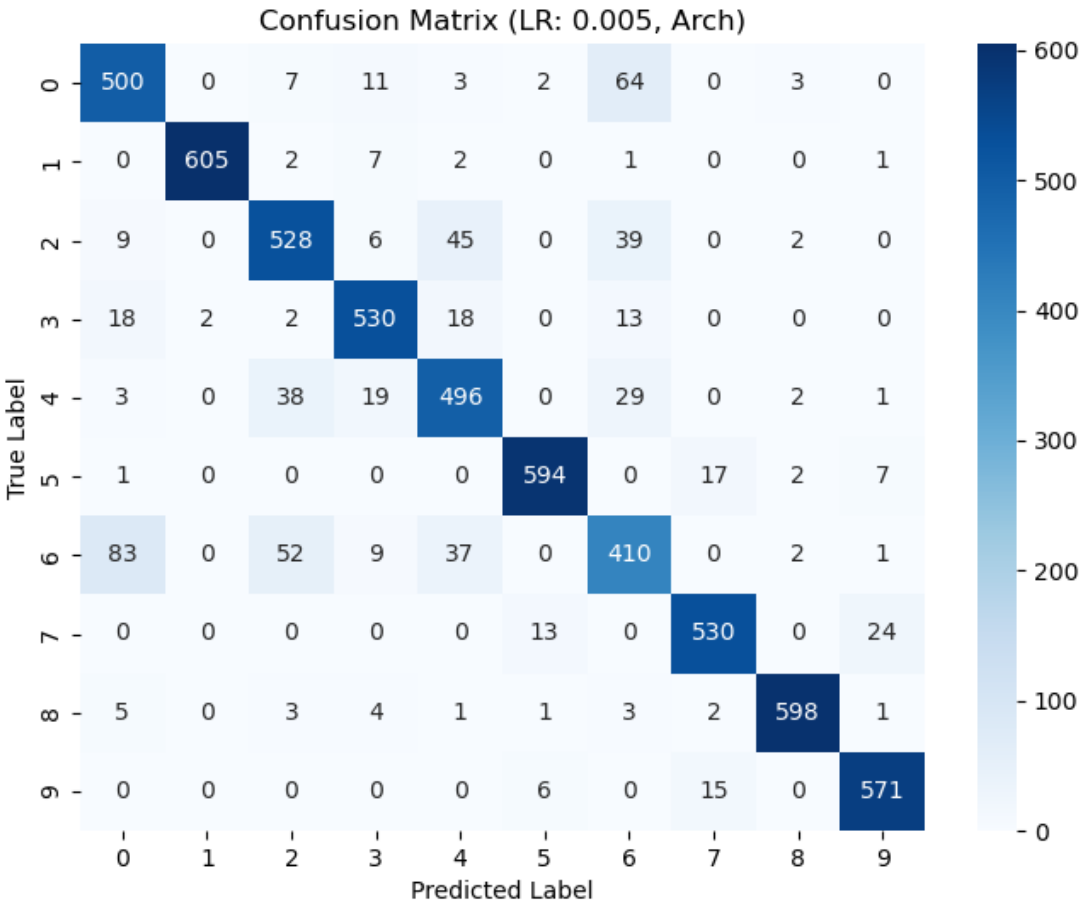
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True Label
Predicted Label
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18 2 2 530 18 0 13 0 0 0
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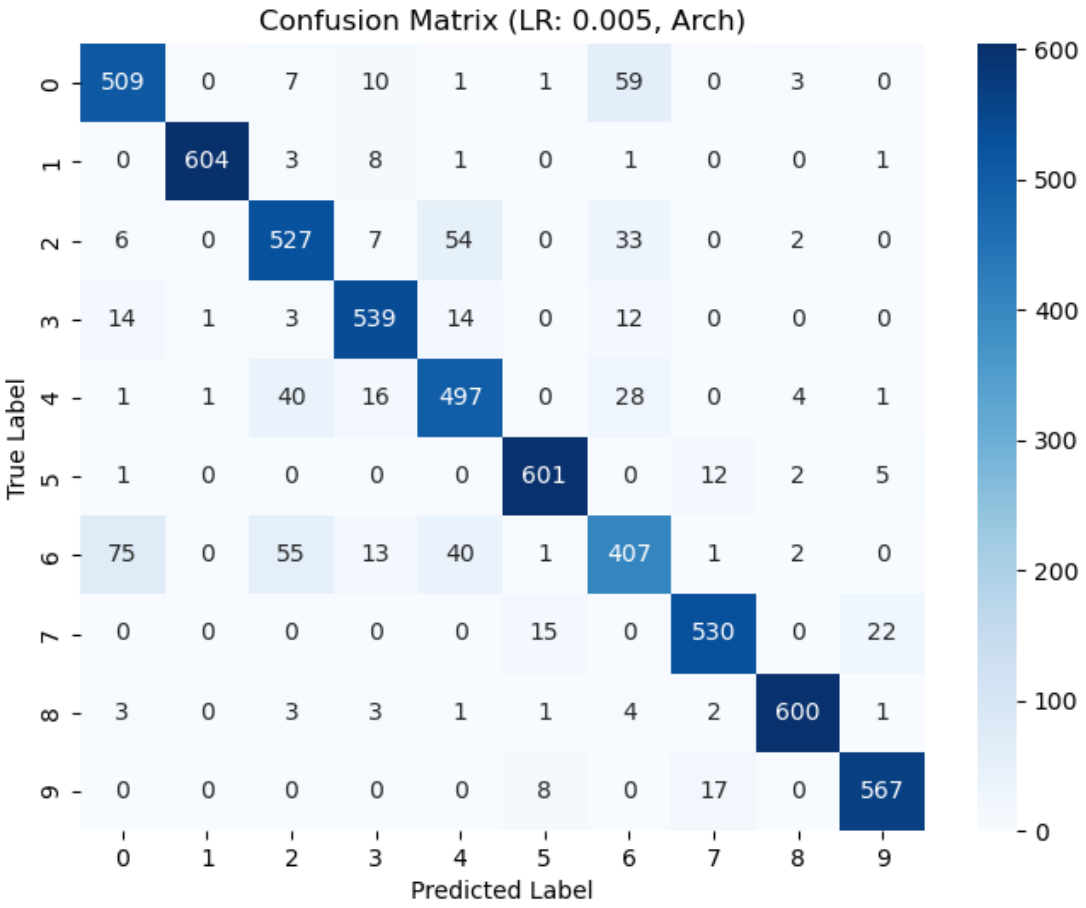
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True Label
Predicted Label
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4 1 1 40 16 497 0 28 0 4 1
5 1 0 0 0 0 601 0 12 2 5
6 75 0 55 13 40 1 407 1 2 0
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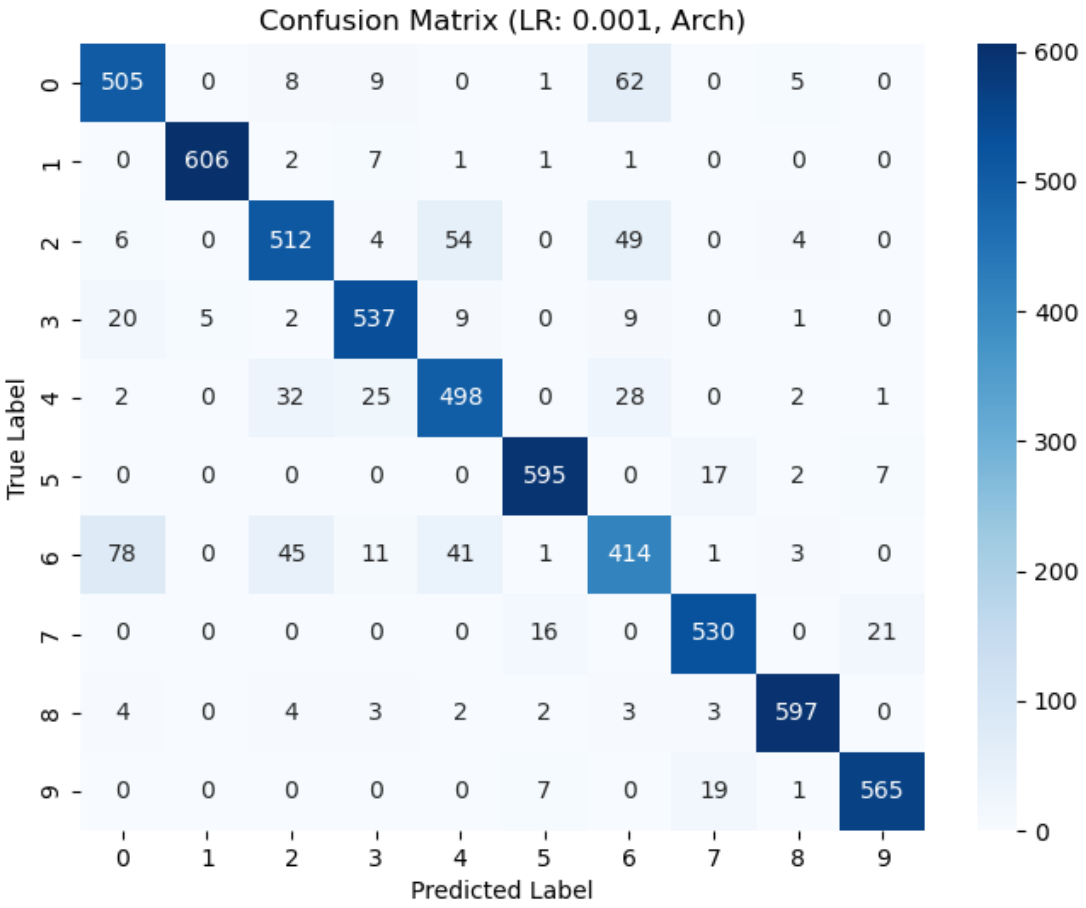
Confusion Matrix (LR: 0.001, Arch)
True Label
Predicted Label
0 505 0 8 9 0 1 62 0 5 0
1 0 606 2 7 1 1 1 0 0 0
2 6 0 512 4 54 0 49 0 4 0
3 20 5 2 537 9 0 9 0 1 0
4 2 0 32 25 498 0 28 0 2 1
5 0 0 0 0 0 595 0 17 2 7
6 78 0 45 11 41 1 414 1 3 0
7 0 0 0 0 0 16 0 530 0 21
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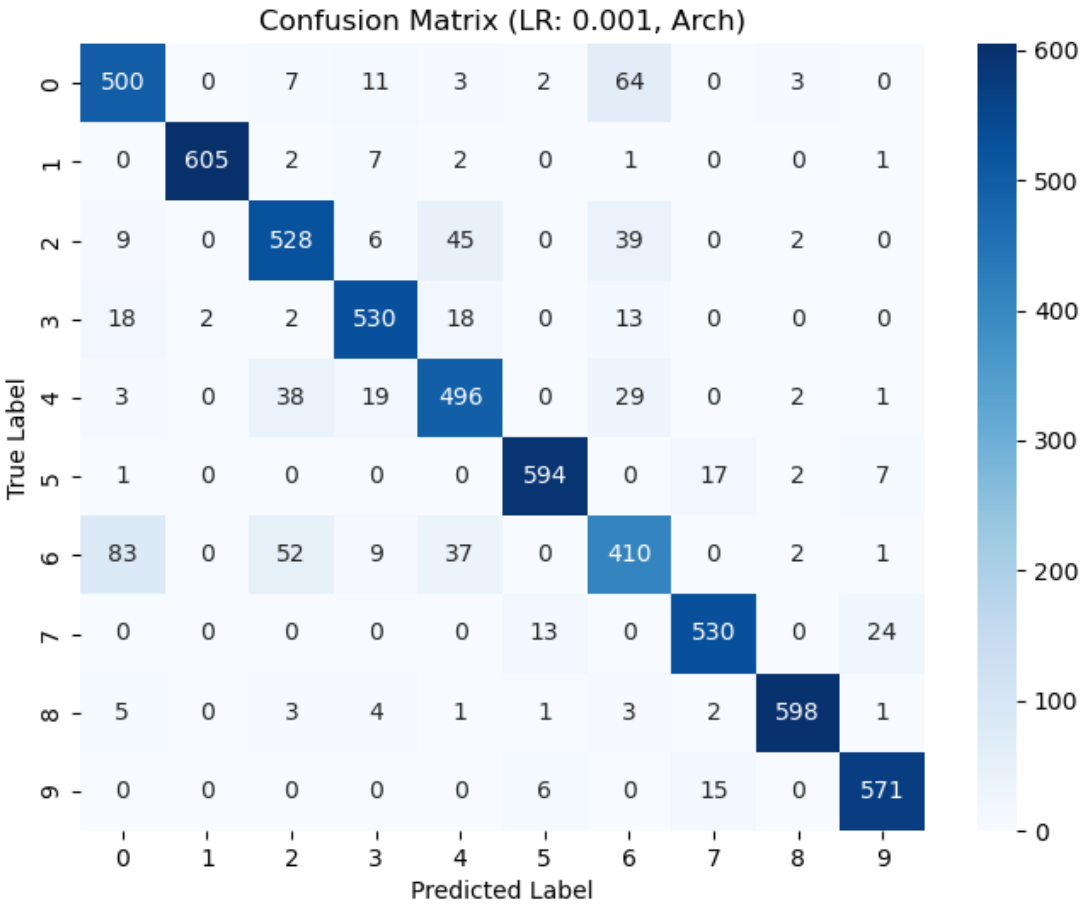
Confusion Matrix (LR: 0.001, Arch)
True Label
Predicted Label
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0 605 2 7 2 0 1 0 0 1
9 0 528 6 45 0 39 0 2 0
18 2 2 530 18 0 13 0 0 0
3 0 38 19 496 0 29 0 2 1
1 0 0 0 0 594 0 17 2 7
83 0 52 9 37 0 410 0 2 1
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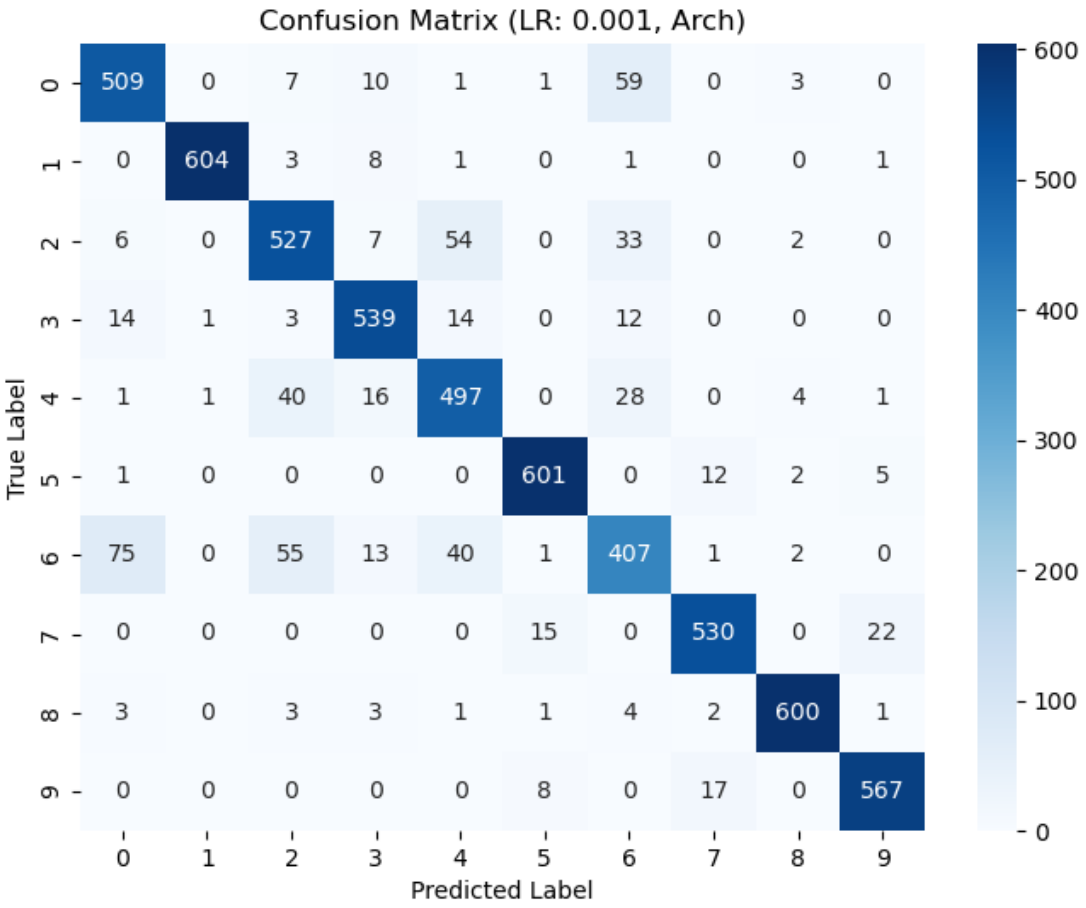
Confusion Matrix (LR: 0.001, Arch)
True Label
Predicted Label
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1 0 604 3 8 1 0 1 0 0 1
2 6 0 527 7 54 0 33 0 2 0
3 14 1 3 539 14 0 12 0 0 0
4 1 1 40 16 497 0 28 0 4 1
5 1 0 0 0 0 601 0 12 2 5
6 75 0 55 13 40 1 407 1 2 0
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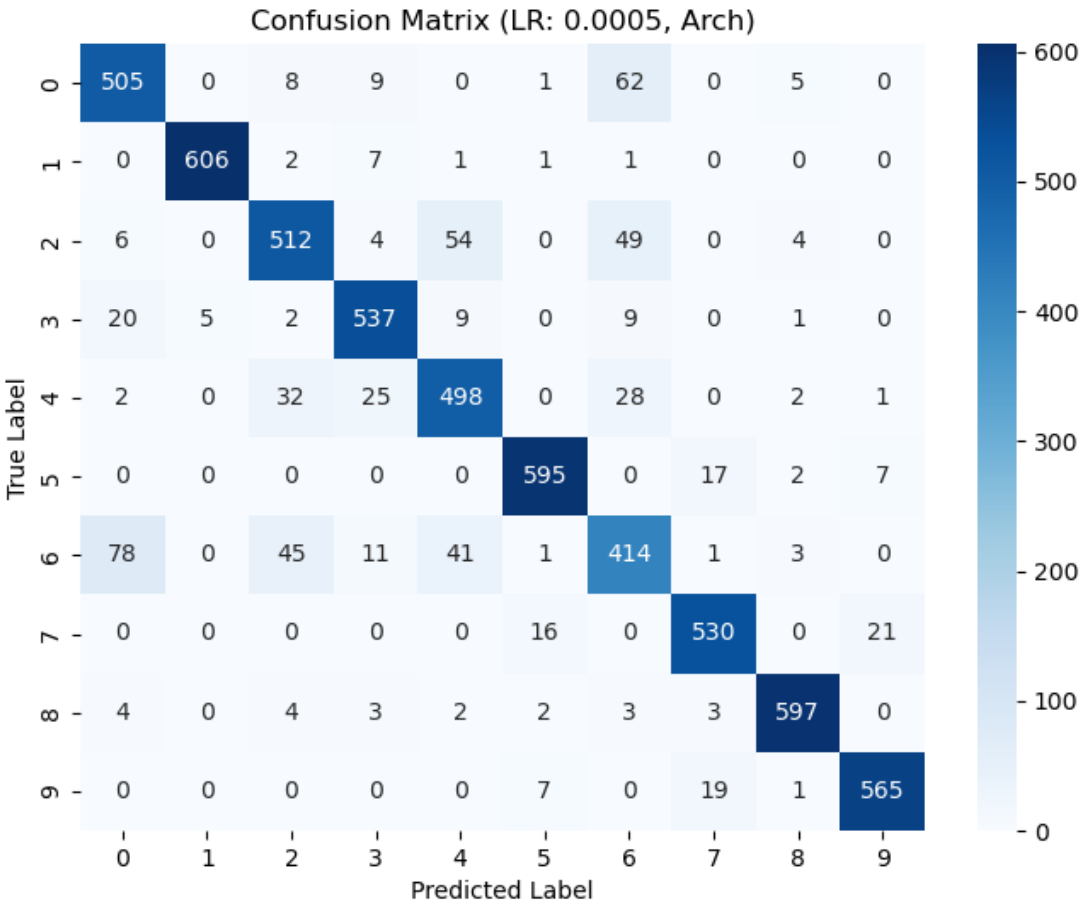
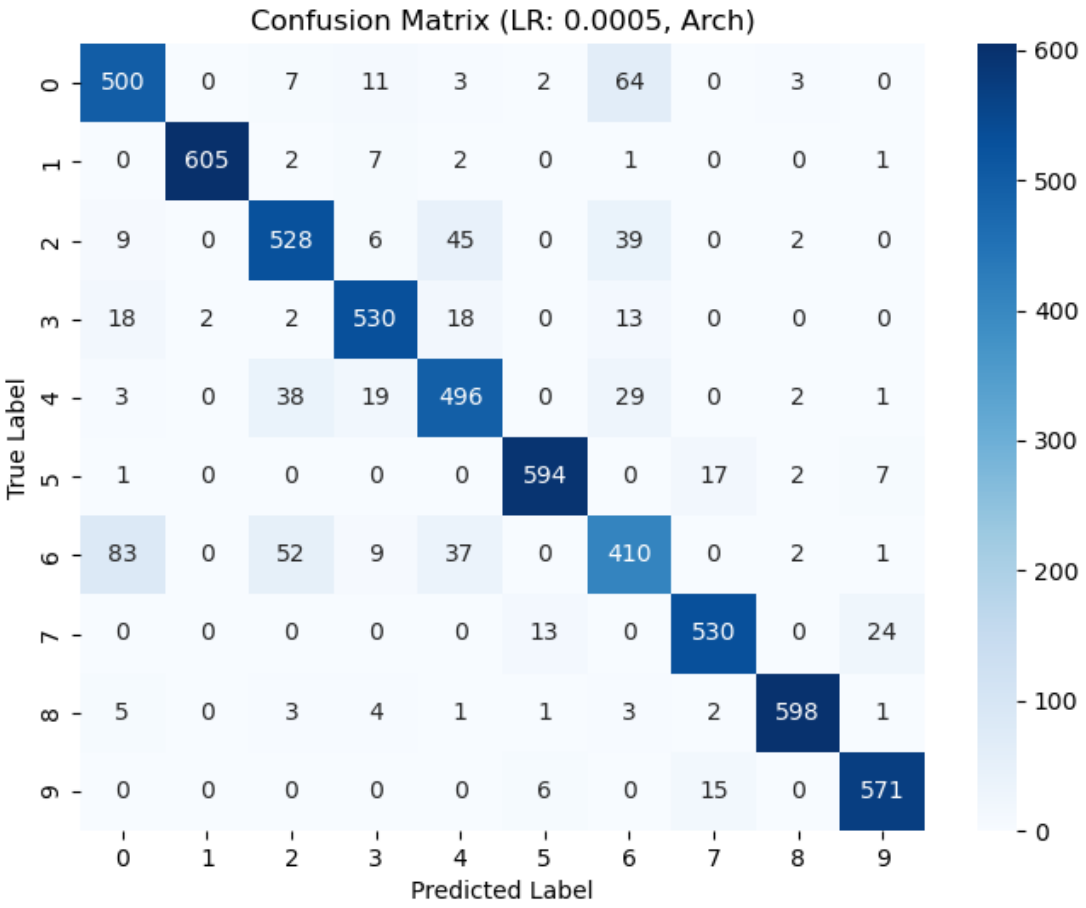
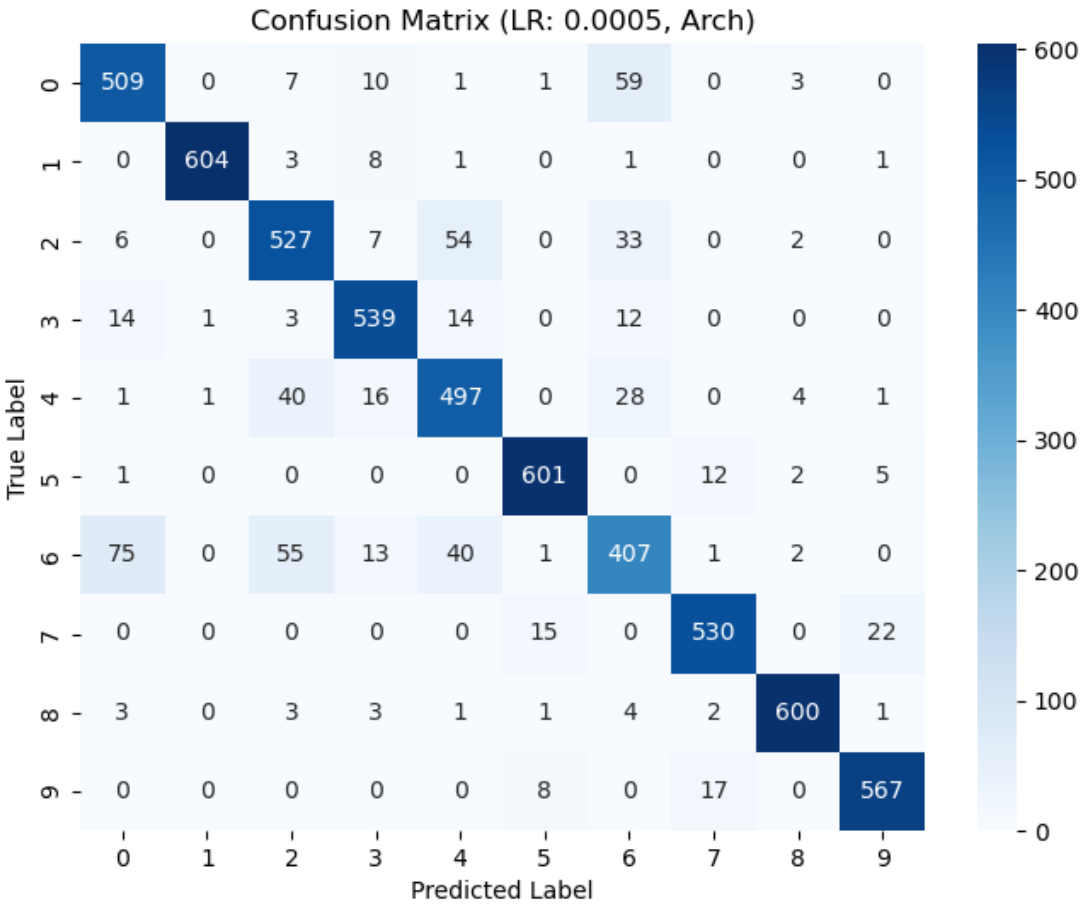
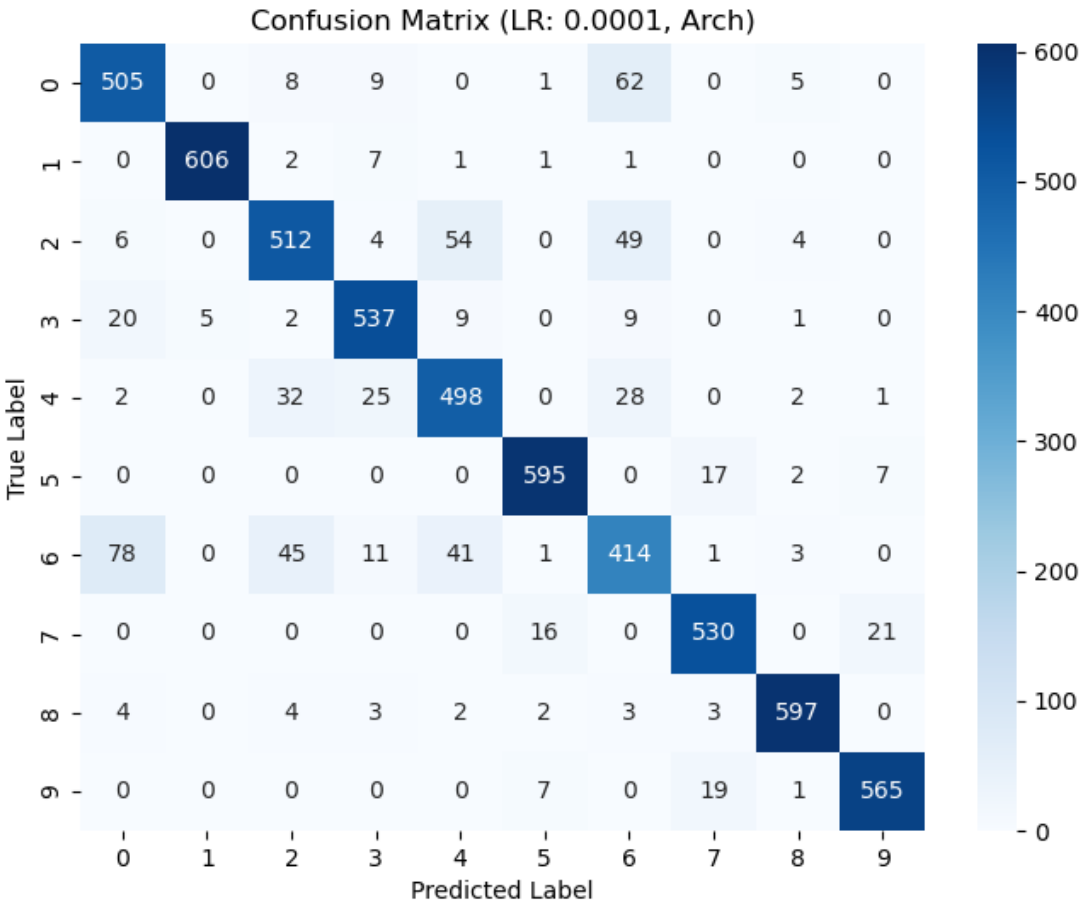
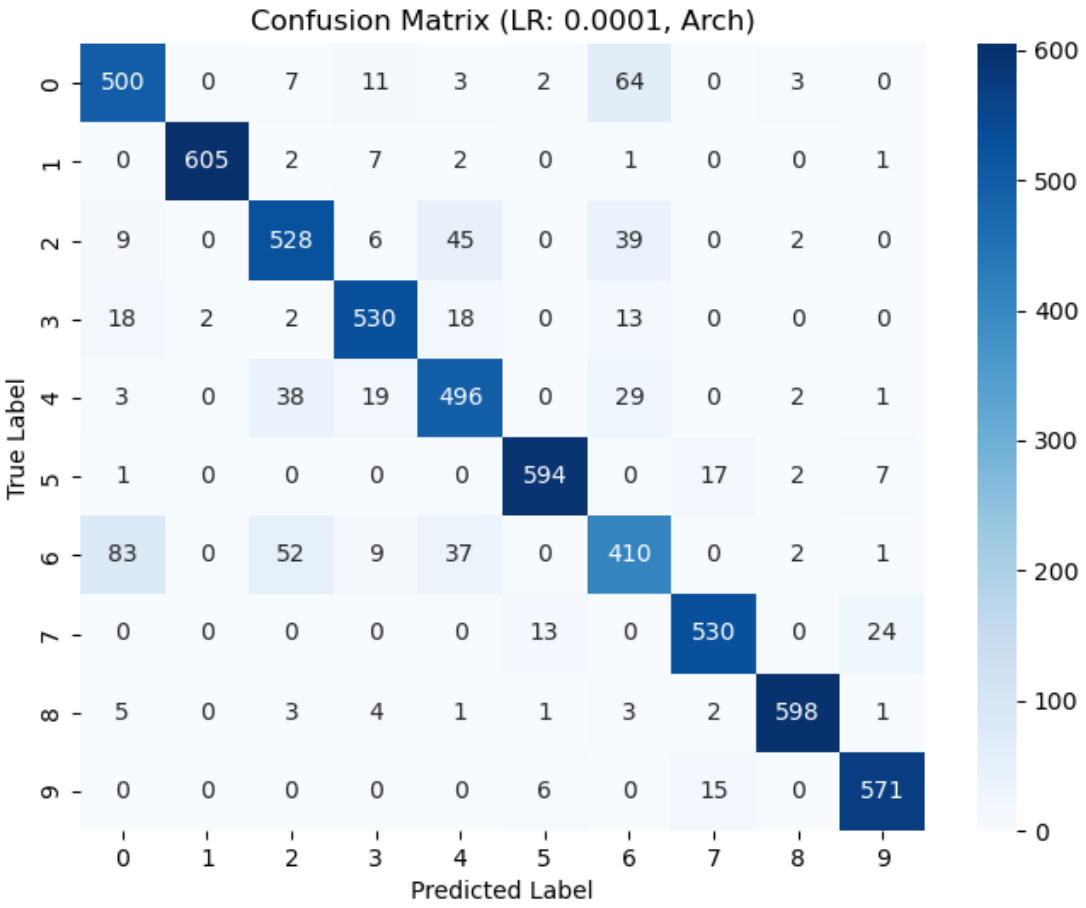
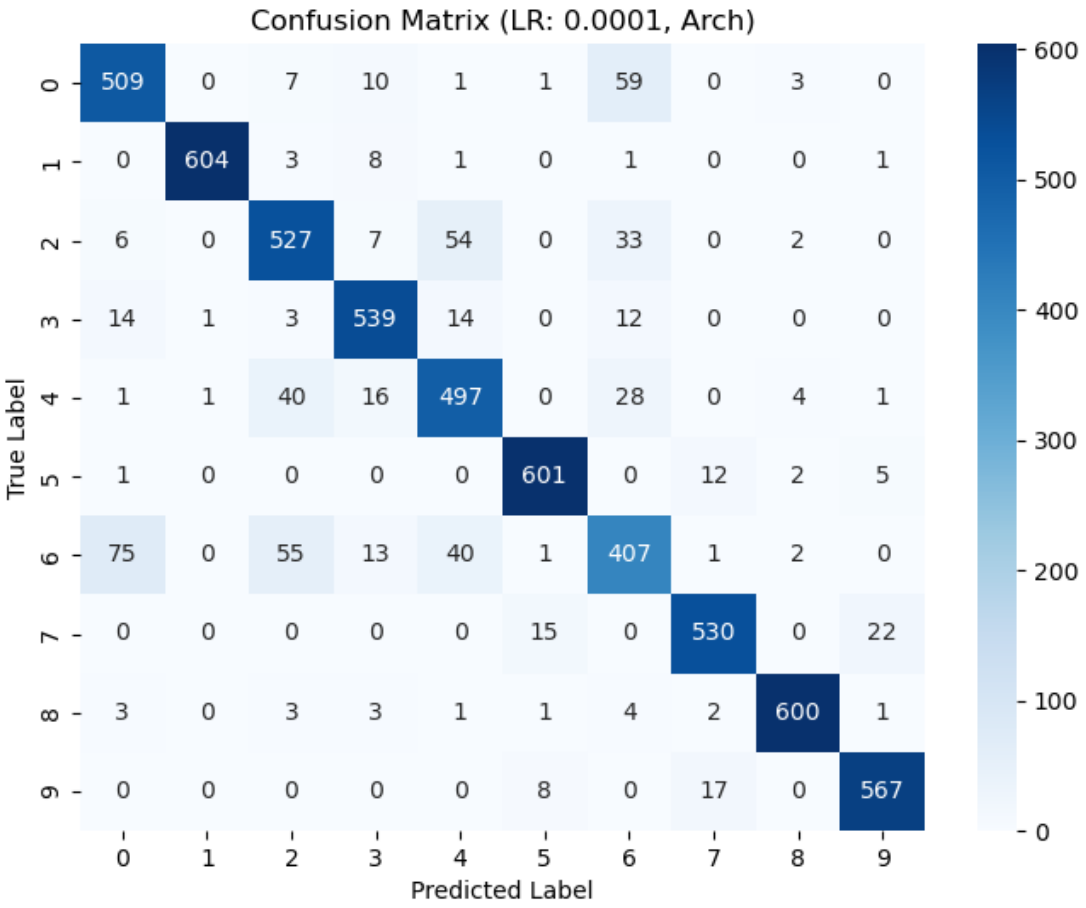

Confusion Matrix (LR: 0.0005, Arch)
True Label
Predicted Label
0 505 0 8 9 0 1 62 0 5 0
1 0 606 2 7 1 1 1 0 0 0
2 6 0 512 4 54 0 49 0 4 0
3 20 5 2 537 9 0 9 0 1 0
4 2 0 32 25 498 0 28 0 2 1
5 0 0 0 0 0 595 0 17 2 7
6 78 0 45 11 41 1 414 1 3 0
7 0 0 0 0 0 16 0 530 0 21
8 4 0 4 3 2 2 3 3 597 0
9 0 0 0 0 0 7 0 19 1 565
0 1 2 3 4 5 6 7 8 9
600
500
400
300
200
100
0

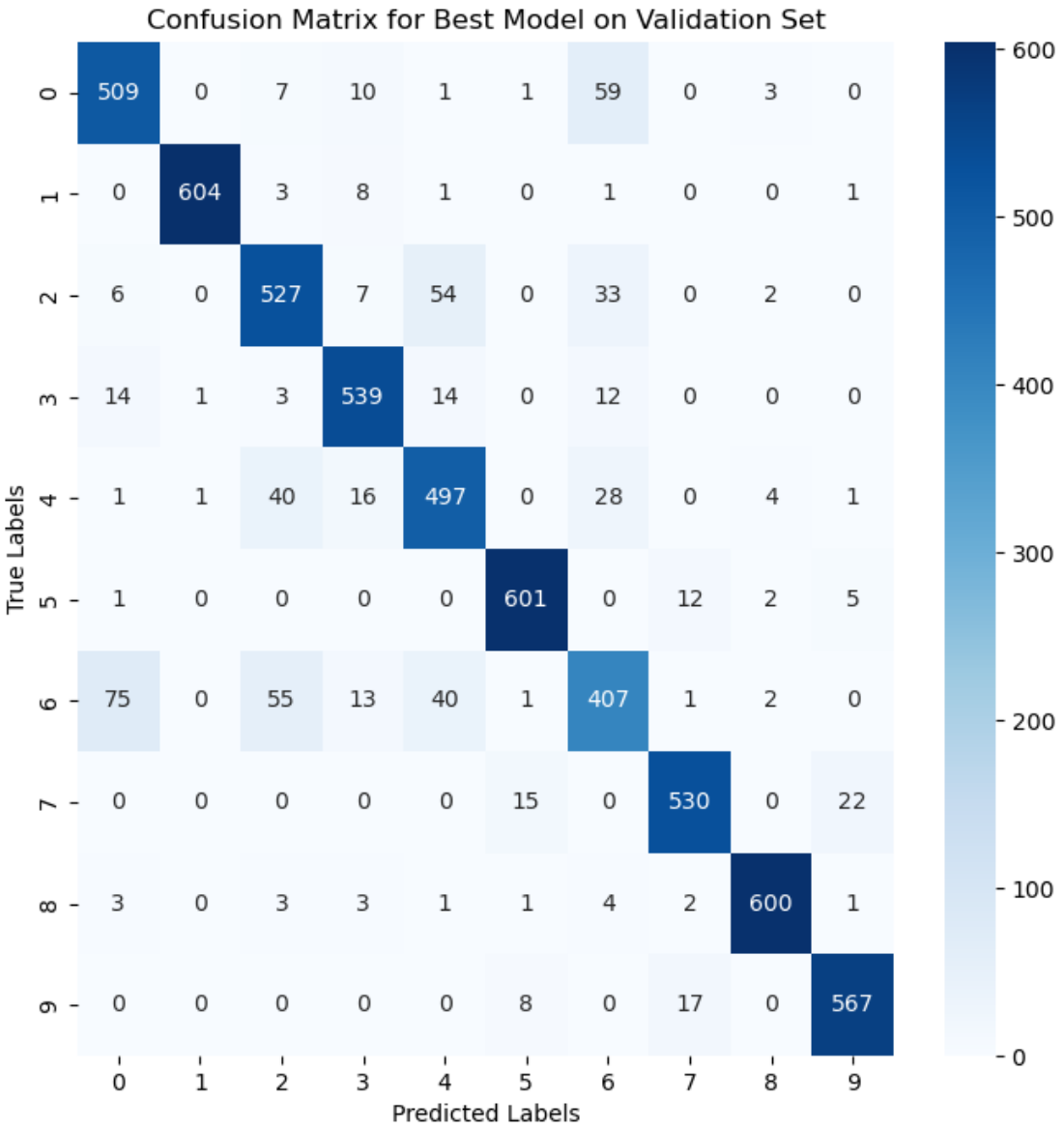

Confusion Matrix (LR: 0.0005, Arch)
True Label
Predicted Label
0 500 0 7 11 3 2 64 0 3 0
1 0 605 2 7 2 0 1 0 0 1
2 9 0 528 6 45 0 39 0 2 0
3 18 2 2 530 18 0 13 0 0 0
4 3 0 38 19 496 0 29 0 2 1
5 1 0 0 0 0 594 0 17 2 7
6 83 0 52 9 37 0 410 0 2 1
7 0 0 0 0 0 13 0 530 0 24
8 5 0 3 4 1 1 3 2 598 1
9 0 0 0 0 0 6 0 15 0 571
0 1 2 3 4 5 6 7 8 9
600 500 400 300 200 100 0


Confusion Matrix (LR: 0.0005, Arch)
True Label
Predicted Label
0 509 0 7 10 1 1 59 0 3 0
1 0 604 3 8 1 0 1 0 0 1
2 6 0 527 7 54 0 33 0 2 0
3 14 1 3 539 14 0 12 0 0 0
4 1 1 40 16 497 0 28 0 4 1
5 1 0 0 0 0 601 0 12 2 5
6 75 0 55 13 40 1 407 1 2 0
7 0 0 0 0 0 15 0 530 0 22
8 3 0 3 3 1 1 4 2 600 1
9 0 0 0 0 0 8 0 17 0 567
0 1 2 3 4 5 6 7 8 9
600 500 400 300 200 100 0


Confusion Matrix (LR: 0.0001, Arch)
True Label
Predicted Label
0 505 0 8 9 0 1 62 0 5 0
1 0 606 2 7 1 1 1 0 0 0
2 6 0 512 4 54 0 49 0 4 0
3 20 5 2 537 9 0 9 0 1 0
4 2 0 32 25 498 0 28 0 2 1
5 0 0 0 0 0 595 0 17 2 7
6 78 0 45 11 41 1 414 1 3 0
7 0 0 0 0 0 16 0 530 0 21
8 4 0 4 3 2 2 3 3 597 0
9 0 0 0 0 0 7 0 19 1 565
0 1 2 3 4 5 6 7 8 9
600
500
400
300
200
100
0


Confusion Matrix (LR: 0.0001, Arch)
True Label
Predicted Label
0 1 2 3 4 5 6 7 8 9
500 0 7 11 3 2 64 0 3 0
0 605 2 7 2 0 1 0 0 1
9 0 528 6 45 0 39 0 2 0
18 2 2 530 18 0 13 0 0 0
3 0 38 19 496 0 29 0 2 1
1 0 0 0 0 594 0 17 2 7
83 0 52 9 37 0 410 0 2 1
0 0 0 0 0 13 0 530 0 24
5 0 3 4 1 1 3 2 598 1
0 0 0 0 0 6 0 15 0 571
600
500
400
300
200
100
0


Confusion Matrix (LR: 0.0001, Arch)
True Label
Predicted Label
0 509 0 7 10 1 1 59 0 3 0
1 0 604 3 8 1 0 1 0 0 1
2 6 0 527 7 54 0 33 0 2 0
3 14 1 3 539 14 0 12 0 0 0
4 1 1 40 16 497 0 28 0 4 1
5 1 0 0 0 0 601 0 12 2 5
6 75 0 55 13 40 1 407 1 2 0
7 0 0 0 0 0 15 0 530 0 22
8 3 0 3 3 1 1 4 2 600 1
9 0 0 0 0 0 8 0 17 0 567
0 1 2 3 4 5 6 7 8 9
600 500 400 300 200 100 0


Confusion Matrix for Best Model on Validation Set
True Labels
Predicted Labels
0 509 0 7 10 1 1 59 0 3 0
1 0 604 3 8 1 0 1 0 0 1
2 6 0 527 7 54 0 33 0 2 0
3 14 1 3 539 14 0 12 0 0 0
4 1 1 40 16 497 0 28 0 4 1
5 1 0 0 0 0 601 0 12 2 5
6 75 0 55 13 40 1 407 1 2 0
7 0 0 0 0 0 15 0 530 0 22
8 3 0 3 3 1 1 4 2 600 1
9 0 0 0 0 0 8 0 17 0 567
0 1 2 3 4 5 6 7 8 9
600 500 400 300 200 100 0

Test Results:

Test Loss: 0.3211, Test Accuracy: 0.8894, Test Macro-F1: 0.8891