**Multi-class logistic regression cross validation results (without PCA)**:

Cross-Validation Repeat: 1/10

y\_pred\_df Animal.ID: [ 3 6 9 ... 109790 109792 109795]

y\_test\_df Animal.ID: [ 3 6 9 ... 109790 109792 109795]

Accuracy: 0.6930

Precision: 0.6704

Recall: 0.6966

F1 Score: 0.6675

Log Loss: 0.8515

y\_pred\_df Animal.ID: [ 1 8 11 ... 109779 109781 109794]

y\_test\_df Animal.ID: [ 1 8 11 ... 109779 109781 109794]

Accuracy: 0.6991

Precision: 0.6835

Recall: 0.6995

F1 Score: 0.6707

Log Loss: 0.8306

y\_pred\_df Animal.ID: [ 0 4 5 ... 109787 109789 109791]

y\_test\_df Animal.ID: [ 0 4 5 ... 109787 109789 109791]

Accuracy: 0.6906

Precision: 0.6672

Recall: 0.6906

F1 Score: 0.6625

Log Loss: 0.8592

y\_pred\_df Animal.ID: [ 7 16 19 ... 109785 109786 109793]

y\_test\_df Animal.ID: [ 7 16 19 ... 109785 109786 109793]

Accuracy: 0.6951

Precision: 0.6751

Recall: 0.6954

F1 Score: 0.6675

Log Loss: 0.8510

y\_pred\_df Animal.ID: [ 2 10 13 ... 109770 109771 109774]

y\_test\_df Animal.ID: [ 2 10 13 ... 109770 109771 109774]

Accuracy: 0.6921

Precision: 0.6760

Recall: 0.6922

F1 Score: 0.6624

Log Loss: 0.8590

Average Metrics for Repetition 1/10:

Accuracy: 0.6940

Precision: 0.6744

Recall: 0.6949

F1\_score: 0.6661

Log\_loss: 0.8502

Cross-Validation Repeat: 2/10

y\_pred\_df Animal.ID: [ 1 4 6 ... 109786 109789 109791]

y\_test\_df Animal.ID: [ 1 4 6 ... 109786 109789 109791]

Accuracy: 0.6917

Precision: 0.6768

Recall: 0.6955

F1 Score: 0.6660

Log Loss: 0.8492

y\_pred\_df Animal.ID: [ 17 20 23 ... 109782 109783 109792]

y\_test\_df Animal.ID: [ 17 20 23 ... 109782 109783 109792]

Accuracy: 0.6965

Precision: 0.6831

Recall: 0.6969

F1 Score: 0.6697

Log Loss: 0.8360

y\_pred\_df Animal.ID: [ 3 13 14 ... 109779 109785 109787]

y\_test\_df Animal.ID: [ 3 13 14 ... 109779 109785 109787]

Accuracy: 0.6902

Precision: 0.6706

Recall: 0.6977

F1 Score: 0.6684

Log Loss: 0.8564

y\_pred\_df Animal.ID: [ 0 2 5 ... 109775 109778 109793]

y\_test\_df Animal.ID: [ 0 2 5 ... 109775 109778 109793]

Accuracy: 0.7011

Precision: 0.6853

Recall: 0.7041

F1 Score: 0.6759

Log Loss: 0.8361

y\_pred\_df Animal.ID: [ 7 9 15 ... 109790 109794 109795]

y\_test\_df Animal.ID: [ 7 9 15 ... 109790 109794 109795]

Accuracy: 0.6921

Precision: 0.6724

Recall: 0.6922

F1 Score: 0.6623

Log Loss: 0.8507

Average Metrics for Repetition 2/10:

Accuracy: 0.6943

Precision: 0.6776

Recall: 0.6973

F1\_score: 0.6685

Log\_loss: 0.8457

Cross-Validation Repeat: 3/10

y\_pred\_df Animal.ID: [ 7 10 17 ... 109787 109789 109792]

y\_test\_df Animal.ID: [ 7 10 17 ... 109787 109789 109792]

Accuracy: 0.6900

Precision: 0.6715

Recall: 0.6904

F1 Score: 0.6608

Log Loss: 0.8581

y\_pred\_df Animal.ID: [ 0 1 4 ... 109776 109779 109794]

y\_test\_df Animal.ID: [ 0 1 4 ... 109776 109779 109794]

Accuracy: 0.6961

Precision: 0.6775

Recall: 0.7028

F1 Score: 0.6736

Log Loss: 0.8373

y\_pred\_df Animal.ID: [ 2 11 13 ... 109786 109788 109793]

y\_test\_df Animal.ID: [ 2 11 13 ... 109786 109788 109793]

Accuracy: 0.6936

Precision: 0.6755

Recall: 0.6938

F1 Score: 0.6652

Log Loss: 0.8458

y\_pred\_df Animal.ID: [ 5 6 8 ... 109782 109791 109795]

y\_test\_df Animal.ID: [ 5 6 8 ... 109782 109791 109795]

Accuracy: 0.6944

Precision: 0.6761

Recall: 0.6944

F1 Score: 0.6657

Log Loss: 0.8475

y\_pred\_df Animal.ID: [ 3 12 15 ... 109778 109780 109790]

y\_test\_df Animal.ID: [ 3 12 15 ... 109778 109780 109790]

Accuracy: 0.6980

Precision: 0.6778

Recall: 0.6984

F1 Score: 0.6712

Log Loss: 0.8437

Average Metrics for Repetition 3/10:

Accuracy: 0.6944

Precision: 0.6757

Recall: 0.6960

F1\_score: 0.6673

Log\_loss: 0.8465

Cross-Validation Repeat: 4/10

y\_pred\_df Animal.ID: [ 0 5 9 ... 109782 109785 109795]

y\_test\_df Animal.ID: [ 0 5 9 ... 109782 109785 109795]

Accuracy: 0.6959

Precision: 0.6793

Recall: 0.6961

F1 Score: 0.6674

Log Loss: 0.8485

y\_pred\_df Animal.ID: [ 3 11 17 ... 109781 109783 109790]

y\_test\_df Animal.ID: [ 3 11 17 ... 109781 109783 109790]

Accuracy: 0.6905

Precision: 0.6721

Recall: 0.7003

F1 Score: 0.6705

Log Loss: 0.8545

y\_pred\_df Animal.ID: [ 13 14 18 ... 109773 109778 109784]

y\_test\_df Animal.ID: [ 13 14 18 ... 109773 109778 109784]

Accuracy: 0.6959

Precision: 0.6796

Recall: 0.6959

F1 Score: 0.6665

Log Loss: 0.8638

y\_pred\_df Animal.ID: [ 4 7 19 ... 109791 109792 109793]

y\_test\_df Animal.ID: [ 4 7 19 ... 109791 109792 109793]

Accuracy: 0.6954

Precision: 0.6696

Recall: 0.6954

F1 Score: 0.6667

Log Loss: 0.8570

y\_pred\_df Animal.ID: [ 1 2 6 ... 109788 109789 109794]

y\_test\_df Animal.ID: [ 1 2 6 ... 109788 109789 109794]

Accuracy: 0.6911

Precision: 0.6697

Recall: 0.6911

F1 Score: 0.6635

Log Loss: 0.8480

Average Metrics for Repetition 4/10:

Accuracy: 0.6938

Precision: 0.6741

Recall: 0.6958

F1\_score: 0.6669

Log\_loss: 0.8544

Cross-Validation Repeat: 5/10

y\_pred\_df Animal.ID: [ 3 9 10 ... 109781 109783 109793]

y\_test\_df Animal.ID: [ 3 9 10 ... 109781 109783 109793]

Accuracy: 0.6895

Precision: 0.6607

Recall: 0.6895

F1 Score: 0.6602

Log Loss: 0.8788

y\_pred\_df Animal.ID: [ 4 6 7 ... 109792 109794 109795]

y\_test\_df Animal.ID: [ 4 6 7 ... 109792 109794 109795]

Accuracy: 0.6936

Precision: 0.6746

Recall: 0.6940

F1 Score: 0.6657

Log Loss: 0.8459

y\_pred\_df Animal.ID: [ 0 5 15 ... 109775 109776 109788]

y\_test\_df Animal.ID: [ 0 5 15 ... 109775 109776 109788]

Accuracy: 0.6939

Precision: 0.6785

Recall: 0.6943

F1 Score: 0.6650

Log Loss: 0.8565

y\_pred\_df Animal.ID: [ 8 17 30 ... 109784 109787 109789]

y\_test\_df Animal.ID: [ 8 17 30 ... 109784 109787 109789]

Accuracy: 0.6962

Precision: 0.6733

Recall: 0.6964

F1 Score: 0.6678

Log Loss: 0.8360

y\_pred\_df Animal.ID: [ 1 2 13 ... 109782 109785 109790]

y\_test\_df Animal.ID: [ 1 2 13 ... 109782 109785 109790]

Accuracy: 0.6939

Precision: 0.6725

Recall: 0.6940

F1 Score: 0.6660

Log Loss: 0.8406

Average Metrics for Repetition 5/10:

Accuracy: 0.6934

Precision: 0.6719

Recall: 0.6936

F1\_score: 0.6649

Log\_loss: 0.8516

Cross-Validation Repeat: 6/10

y\_pred\_df Animal.ID: [ 7 12 27 ... 109777 109792 109793]

y\_test\_df Animal.ID: [ 7 12 27 ... 109777 109792 109793]

Accuracy: 0.6967

Precision: 0.6837

Recall: 0.6992

F1 Score: 0.6704

Log Loss: 0.8362

y\_pred\_df Animal.ID: [ 1 3 13 ... 109775 109780 109790]

y\_test\_df Animal.ID: [ 1 3 13 ... 109775 109780 109790]

Accuracy: 0.6931

Precision: 0.6747

Recall: 0.6931

F1 Score: 0.6640

Log Loss: 0.8503

y\_pred\_df Animal.ID: [ 5 6 8 ... 109787 109788 109795]

y\_test\_df Animal.ID: [ 5 6 8 ... 109787 109788 109795]

Accuracy: 0.6897

Precision: 0.6685

Recall: 0.6928

F1 Score: 0.6638

Log Loss: 0.8561

y\_pred\_df Animal.ID: [ 2 17 19 ... 109782 109783 109794]

y\_test\_df Animal.ID: [ 2 17 19 ... 109782 109783 109794]

Accuracy: 0.6928

Precision: 0.6704

Recall: 0.6998

F1 Score: 0.6696

Log Loss: 0.8659

y\_pred\_df Animal.ID: [ 0 4 10 ... 109785 109789 109791]

y\_test\_df Animal.ID: [ 0 4 10 ... 109785 109789 109791]

Accuracy: 0.6957

Precision: 0.6741

Recall: 0.6962

F1 Score: 0.6688

Log Loss: 0.8563

Average Metrics for Repetition 6/10:

Accuracy: 0.6936

Precision: 0.6743

Recall: 0.6962

F1\_score: 0.6673

Log\_loss: 0.8529

Cross-Validation Repeat: 7/10

y\_pred\_df Animal.ID: [ 5 6 7 ... 109788 109791 109792]

y\_test\_df Animal.ID: [ 5 6 7 ... 109788 109791 109792]

Accuracy: 0.6923

Precision: 0.6772

Recall: 0.6923

F1 Score: 0.6628

Log Loss: 0.8411

y\_pred\_df Animal.ID: [ 2 4 17 ... 109774 109780 109794]

y\_test\_df Animal.ID: [ 2 4 17 ... 109774 109780 109794]

Accuracy: 0.6949

Precision: 0.6794

Recall: 0.6952

F1 Score: 0.6665

Log Loss: 0.8381

y\_pred\_df Animal.ID: [ 0 1 11 ... 109786 109787 109795]

y\_test\_df Animal.ID: [ 0 1 11 ... 109786 109787 109795]

Accuracy: 0.6922

Precision: 0.6771

Recall: 0.7032

F1 Score: 0.6740

Log Loss: 0.8609

y\_pred\_df Animal.ID: [ 3 8 9 ... 109784 109785 109789]

y\_test\_df Animal.ID: [ 3 8 9 ... 109784 109785 109789]

Accuracy: 0.6968

Precision: 0.6821

Recall: 0.7005

F1 Score: 0.6725

Log Loss: 0.8522

y\_pred\_df Animal.ID: [ 12 14 19 ... 109777 109790 109793]

y\_test\_df Animal.ID: [ 12 14 19 ... 109777 109790 109793]

Accuracy: 0.6924

Precision: 0.6723

Recall: 0.6927

F1 Score: 0.6641

Log Loss: 0.8510

Average Metrics for Repetition 7/10:

Accuracy: 0.6937

Precision: 0.6776

Recall: 0.6968

F1\_score: 0.6680

Log\_loss: 0.8487

Cross-Validation Repeat: 8/10

y\_pred\_df Animal.ID: [ 29 33 36 ... 109781 109782 109790]

y\_test\_df Animal.ID: [ 29 33 36 ... 109781 109782 109790]

Accuracy: 0.7028

Precision: 0.6859

Recall: 0.7030

F1 Score: 0.6750

Log Loss: 0.8370

y\_pred\_df Animal.ID: [ 1 5 12 ... 109789 109792 109795]

y\_test\_df Animal.ID: [ 1 5 12 ... 109789 109792 109795]

Accuracy: 0.6905

Precision: 0.6736

Recall: 0.6905

F1 Score: 0.6602

Log Loss: 0.8662

y\_pred\_df Animal.ID: [ 2 3 4 ... 109783 109786 109794]

y\_test\_df Animal.ID: [ 2 3 4 ... 109783 109786 109794]

Accuracy: 0.6927

Precision: 0.6768

Recall: 0.6931

F1 Score: 0.6646

Log Loss: 0.8741

y\_pred\_df Animal.ID: [ 6 15 19 ... 109774 109779 109791]

y\_test\_df Animal.ID: [ 6 15 19 ... 109774 109779 109791]

Accuracy: 0.6871

Precision: 0.6624

Recall: 0.6872

F1 Score: 0.6581

Log Loss: 0.8607

y\_pred\_df Animal.ID: [ 0 10 11 ... 109785 109788 109793]

y\_test\_df Animal.ID: [ 0 10 11 ... 109785 109788 109793]

Accuracy: 0.6942

Precision: 0.6746

Recall: 0.6942

F1 Score: 0.6660

Log Loss: 0.8484

Average Metrics for Repetition 8/10:

Accuracy: 0.6935

Precision: 0.6747

Recall: 0.6936

F1\_score: 0.6648

Log\_loss: 0.8573

Cross-Validation Repeat: 9/10

y\_pred\_df Animal.ID: [ 1 7 10 ... 109778 109780 109791]

y\_test\_df Animal.ID: [ 1 7 10 ... 109778 109780 109791]

Accuracy: 0.6978

Precision: 0.6729

Recall: 0.6982

F1 Score: 0.6690

Log Loss: 0.8496

y\_pred\_df Animal.ID: [ 0 2 3 ... 109790 109793 109795]

y\_test\_df Animal.ID: [ 0 2 3 ... 109790 109793 109795]

Accuracy: 0.6938

Precision: 0.6733

Recall: 0.6971

F1 Score: 0.6678

Log Loss: 0.8499

y\_pred\_df Animal.ID: [ 5 11 12 ... 109787 109792 109794]

y\_test\_df Animal.ID: [ 5 11 12 ... 109787 109792 109794]

Accuracy: 0.6878

Precision: 0.6737

Recall: 0.6882

F1 Score: 0.6597

Log Loss: 0.8501

y\_pred\_df Animal.ID: [ 8 14 15 ... 109763 109773 109774]

y\_test\_df Animal.ID: [ 8 14 15 ... 109763 109773 109774]

Accuracy: 0.6991

Precision: 0.6841

Recall: 0.6994

F1 Score: 0.6724

Log Loss: 0.8308

y\_pred\_df Animal.ID: [ 6 13 16 ... 109760 109768 109789]

y\_test\_df Animal.ID: [ 6 13 16 ... 109760 109768 109789]

Accuracy: 0.6897

Precision: 0.6725

Recall: 0.6999

F1 Score: 0.6695

Log Loss: 0.8679

Average Metrics for Repetition 9/10:

Accuracy: 0.6936

Precision: 0.6753

Recall: 0.6965

F1\_score: 0.6677

Log\_loss: 0.8497

Cross-Validation Repeat: 10/10

y\_pred\_df Animal.ID: [ 14 22 24 ... 109782 109787 109788]

y\_test\_df Animal.ID: [ 14 22 24 ... 109782 109787 109788]

Accuracy: 0.6947

Precision: 0.6783

Recall: 0.7053

F1 Score: 0.6763

Log Loss: 0.8476

y\_pred\_df Animal.ID: [ 4 8 11 ... 109790 109792 109793]

y\_test\_df Animal.ID: [ 4 8 11 ... 109790 109792 109793]

Accuracy: 0.6959

Precision: 0.6822

Recall: 0.6960

F1 Score: 0.6667

Log Loss: 0.8551

y\_pred\_df Animal.ID: [ 2 3 7 ... 109775 109784 109785]

y\_test\_df Animal.ID: [ 2 3 7 ... 109775 109784 109785]

Accuracy: 0.6947

Precision: 0.6690

Recall: 0.6947

F1 Score: 0.6659

Log Loss: 0.8554

y\_pred\_df Animal.ID: [ 0 1 5 ... 109762 109786 109794]

y\_test\_df Animal.ID: [ 0 1 5 ... 109762 109786 109794]

Accuracy: 0.6935

Precision: 0.6743

Recall: 0.7008

F1 Score: 0.6721

Log Loss: 0.8424

y\_pred\_df Animal.ID: [ 6 10 35 ... 109783 109791 109795]

y\_test\_df Animal.ID: [ 6 10 35 ... 109783 109791 109795]

Accuracy: 0.6910

Precision: 0.6705

Recall: 0.6940

F1 Score: 0.6652

Log Loss: 0.8701

Average Metrics for Repetition 10/10:

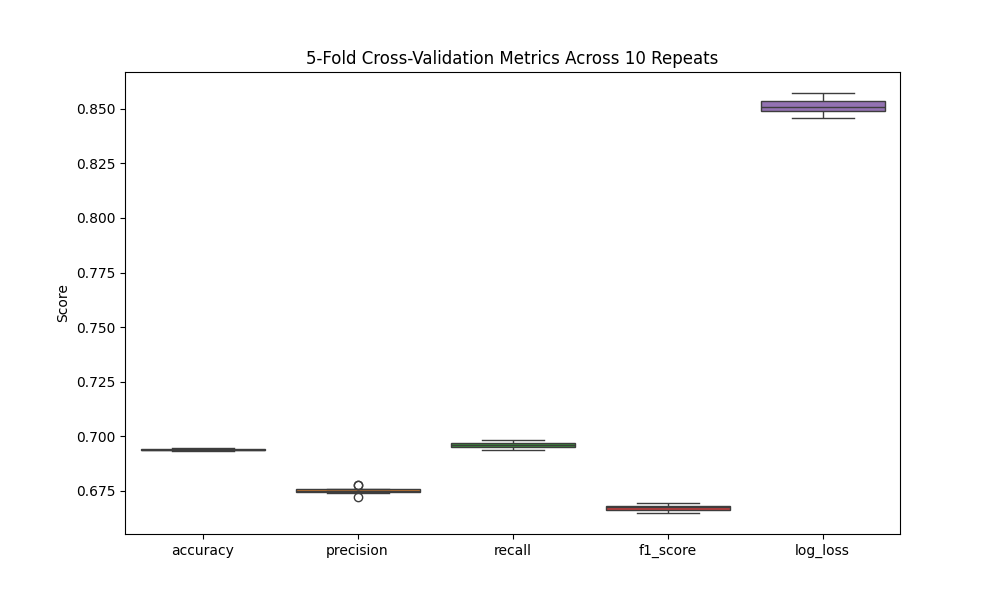
Accuracy: 0.6940

Precision: 0.6749

Recall: 0.6982

F1\_score: 0.6692

Log\_loss: 0.8541



**Multi-class logistic regression cross validation results (with PCA)**:

Cross-Validation Repeat: 1/10

y\_pred\_df Animal.ID: [ 3 6 9 ... 109790 109792 109795]

y\_test\_df Animal.ID: [ 3 6 9 ... 109790 109792 109795]

Accuracy: 0.6495

Precision: 0.6191

Recall: 0.6529

F1 Score: 0.6170

Log Loss: 0.9433

y\_pred\_df Animal.ID: [ 1 8 11 ... 109779 109781 109794]

y\_test\_df Animal.ID: [ 1 8 11 ... 109779 109781 109794]

Accuracy: 0.6555

Precision: 0.6358

Recall: 0.6559

F1 Score: 0.6208

Log Loss: 0.9223

y\_pred\_df Animal.ID: [ 0 4 5 ... 109787 109789 109791]

y\_test\_df Animal.ID: [ 0 4 5 ... 109787 109789 109791]

Accuracy: 0.6509

Precision: 0.6251

Recall: 0.6542

F1 Score: 0.6205

Log Loss: 0.9429

y\_pred\_df Animal.ID: [ 7 16 19 ... 109785 109786 109793]

y\_test\_df Animal.ID: [ 7 16 19 ... 109785 109786 109793]

Accuracy: 0.6542

Precision: 0.6283

Recall: 0.6545

F1 Score: 0.6210

Log Loss: 0.9362

y\_pred\_df Animal.ID: [ 2 10 13 ... 109770 109771 109774]

y\_test\_df Animal.ID: [ 2 10 13 ... 109770 109771 109774]

Accuracy: 0.6505

Precision: 0.6272

Recall: 0.6581

F1 Score: 0.6217

Log Loss: 0.9515

Average Metrics for Repetition 1/10:

Accuracy: 0.6521

Precision: 0.6271

Recall: 0.6551

F1\_score: 0.6202

Log\_loss: 0.9392

Cross-Validation Repeat: 2/10

y\_pred\_df Animal.ID: [ 1 4 6 ... 109786 109789 109791]

y\_test\_df Animal.ID: [ 1 4 6 ... 109786 109789 109791]

Accuracy: 0.6479

Precision: 0.6264

Recall: 0.6481

F1 Score: 0.6133

Log Loss: 0.9462

y\_pred\_df Animal.ID: [ 17 20 23 ... 109782 109783 109792]

y\_test\_df Animal.ID: [ 17 20 23 ... 109782 109783 109792]

Accuracy: 0.6542

Precision: 0.6328

Recall: 0.6569

F1 Score: 0.6228

Log Loss: 0.9152

y\_pred\_df Animal.ID: [ 3 13 14 ... 109779 109785 109787]

y\_test\_df Animal.ID: [ 3 13 14 ... 109779 109785 109787]

Accuracy: 0.6494

Precision: 0.6223

Recall: 0.6564

F1 Score: 0.6205

Log Loss: 0.9516

y\_pred\_df Animal.ID: [ 0 2 5 ... 109775 109778 109793]

y\_test\_df Animal.ID: [ 0 2 5 ... 109775 109778 109793]

Accuracy: 0.6573

Precision: 0.6335

Recall: 0.6601

F1 Score: 0.6261

Log Loss: 0.9161

y\_pred\_df Animal.ID: [ 7 9 15 ... 109790 109794 109795]

y\_test\_df Animal.ID: [ 7 9 15 ... 109790 109794 109795]

Accuracy: 0.6508

Precision: 0.6237

Recall: 0.6542

F1 Score: 0.6182

Log Loss: 0.9510

Average Metrics for Repetition 2/10:

Accuracy: 0.6519

Precision: 0.6278

Recall: 0.6552

F1\_score: 0.6202

Log\_loss: 0.9360

Cross-Validation Repeat: 3/10

y\_pred\_df Animal.ID: [ 7 10 17 ... 109787 109789 109792]

y\_test\_df Animal.ID: [ 7 10 17 ... 109787 109789 109792]

Accuracy: 0.6500

Precision: 0.6313

Recall: 0.6536

F1 Score: 0.6174

Log Loss: 0.9434

y\_pred\_df Animal.ID: [ 0 1 4 ... 109776 109779 109794]

y\_test\_df Animal.ID: [ 0 1 4 ... 109776 109779 109794]

Accuracy: 0.6530

Precision: 0.6263

Recall: 0.6556

F1 Score: 0.6205

Log Loss: 0.9351

y\_pred\_df Animal.ID: [ 2 11 13 ... 109786 109788 109793]

y\_test\_df Animal.ID: [ 2 11 13 ... 109786 109788 109793]

Accuracy: 0.6529

Precision: 0.6216

Recall: 0.6532

F1 Score: 0.6189

Log Loss: 0.9393

y\_pred\_df Animal.ID: [ 5 6 8 ... 109782 109791 109795]

y\_test\_df Animal.ID: [ 5 6 8 ... 109782 109791 109795]

Accuracy: 0.6503

Precision: 0.6273

Recall: 0.6503

F1 Score: 0.6155

Log Loss: 0.9319

y\_pred\_df Animal.ID: [ 3 12 15 ... 109778 109780 109790]

y\_test\_df Animal.ID: [ 3 12 15 ... 109778 109780 109790]

Accuracy: 0.6544

Precision: 0.6262

Recall: 0.6547

F1 Score: 0.6208

Log Loss: 0.9314

Average Metrics for Repetition 3/10:

Accuracy: 0.6521

Precision: 0.6266

Recall: 0.6535

F1\_score: 0.6186

Log\_loss: 0.9362

Cross-Validation Repeat: 4/10

y\_pred\_df Animal.ID: [ 0 5 9 ... 109782 109785 109795]

y\_test\_df Animal.ID: [ 0 5 9 ... 109782 109785 109795]

Accuracy: 0.6557

Precision: 0.6318

Recall: 0.6619

F1 Score: 0.6268

Log Loss: 0.9239

y\_pred\_df Animal.ID: [ 3 11 17 ... 109781 109783 109790]

y\_test\_df Animal.ID: [ 3 11 17 ... 109781 109783 109790]

Accuracy: 0.6478

Precision: 0.6232

Recall: 0.6569

F1 Score: 0.6211

Log Loss: 0.9500

y\_pred\_df Animal.ID: [ 13 14 18 ... 109773 109778 109784]

y\_test\_df Animal.ID: [ 13 14 18 ... 109773 109778 109784]

Accuracy: 0.6548

Precision: 0.6228

Recall: 0.6548

F1 Score: 0.6195

Log Loss: 0.9373

y\_pred\_df Animal.ID: [ 4 7 19 ... 109791 109792 109793]

y\_test\_df Animal.ID: [ 4 7 19 ... 109791 109792 109793]

Accuracy: 0.6536

Precision: 0.6242

Recall: 0.6536

F1 Score: 0.6187

Log Loss: 0.9422

y\_pred\_df Animal.ID: [ 1 2 6 ... 109788 109789 109794]

y\_test\_df Animal.ID: [ 1 2 6 ... 109788 109789 109794]

Accuracy: 0.6492

Precision: 0.6236

Recall: 0.6495

F1 Score: 0.6162

Log Loss: 0.9333

Average Metrics for Repetition 4/10:

Accuracy: 0.6522

Precision: 0.6251

Recall: 0.6554

F1\_score: 0.6204

Log\_loss: 0.9373

Cross-Validation Repeat: 5/10

y\_pred\_df Animal.ID: [ 3 9 10 ... 109781 109783 109793]

y\_test\_df Animal.ID: [ 3 9 10 ... 109781 109783 109793]

Accuracy: 0.6477

Precision: 0.6135

Recall: 0.6477

F1 Score: 0.6120

Log Loss: 0.9525

y\_pred\_df Animal.ID: [ 4 6 7 ... 109792 109794 109795]

y\_test\_df Animal.ID: [ 4 6 7 ... 109792 109794 109795]

Accuracy: 0.6527

Precision: 0.6339

Recall: 0.6531

F1 Score: 0.6191

Log Loss: 0.9452

y\_pred\_df Animal.ID: [ 0 5 15 ... 109775 109776 109788]

y\_test\_df Animal.ID: [ 0 5 15 ... 109775 109776 109788]

Accuracy: 0.6514

Precision: 0.6250

Recall: 0.6547

F1 Score: 0.6197

Log Loss: 0.9346

y\_pred\_df Animal.ID: [ 8 17 30 ... 109784 109787 109789]

y\_test\_df Animal.ID: [ 8 17 30 ... 109784 109787 109789]

Accuracy: 0.6556

Precision: 0.6258

Recall: 0.6558

F1 Score: 0.6211

Log Loss: 0.9305

y\_pred\_df Animal.ID: [ 1 2 13 ... 109782 109785 109790]

y\_test\_df Animal.ID: [ 1 2 13 ... 109782 109785 109790]

Accuracy: 0.6526

Precision: 0.6248

Recall: 0.6530

F1 Score: 0.6178

Log Loss: 0.9259

Average Metrics for Repetition 5/10:

Accuracy: 0.6520

Precision: 0.6246

Recall: 0.6528

F1\_score: 0.6179

Log\_loss: 0.9377

Cross-Validation Repeat: 6/10

y\_pred\_df Animal.ID: [ 7 12 27 ... 109777 109792 109793]

y\_test\_df Animal.ID: [ 7 12 27 ... 109777 109792 109793]

Accuracy: 0.6530

Precision: 0.6355

Recall: 0.6553

F1 Score: 0.6203

Log Loss: 0.9320

y\_pred\_df Animal.ID: [ 1 3 13 ... 109775 109780 109790]

y\_test\_df Animal.ID: [ 1 3 13 ... 109775 109780 109790]

Accuracy: 0.6513

Precision: 0.6284

Recall: 0.6548

F1 Score: 0.6198

Log Loss: 0.9363

y\_pred\_df Animal.ID: [ 5 6 8 ... 109787 109788 109795]

y\_test\_df Animal.ID: [ 5 6 8 ... 109787 109788 109795]

Accuracy: 0.6468

Precision: 0.6193

Recall: 0.6498

F1 Score: 0.6148

Log Loss: 0.9405

y\_pred\_df Animal.ID: [ 2 17 19 ... 109782 109783 109794]

y\_test\_df Animal.ID: [ 2 17 19 ... 109782 109783 109794]

Accuracy: 0.6516

Precision: 0.6181

Recall: 0.6519

F1 Score: 0.6156

Log Loss: 0.9603

y\_pred\_df Animal.ID: [ 0 4 10 ... 109785 109789 109791]

y\_test\_df Animal.ID: [ 0 4 10 ... 109785 109789 109791]

Accuracy: 0.6544

Precision: 0.6229

Recall: 0.6549

F1 Score: 0.6210

Log Loss: 0.9379

Average Metrics for Repetition 6/10:

Accuracy: 0.6514

Precision: 0.6248

Recall: 0.6533

F1\_score: 0.6183

Log\_loss: 0.9414

Cross-Validation Repeat: 7/10

y\_pred\_df Animal.ID: [ 5 6 7 ... 109788 109791 109792]

y\_test\_df Animal.ID: [ 5 6 7 ... 109788 109791 109792]

Accuracy: 0.6507

Precision: 0.6241

Recall: 0.6511

F1 Score: 0.6149

Log Loss: 0.9442

y\_pred\_df Animal.ID: [ 2 4 17 ... 109774 109780 109794]

y\_test\_df Animal.ID: [ 2 4 17 ... 109774 109780 109794]

Accuracy: 0.6519

Precision: 0.6313

Recall: 0.6522

F1 Score: 0.6173

Log Loss: 0.9304

y\_pred\_df Animal.ID: [ 0 1 11 ... 109786 109787 109795]

y\_test\_df Animal.ID: [ 0 1 11 ... 109786 109787 109795]

Accuracy: 0.6510

Precision: 0.6317

Recall: 0.6614

F1 Score: 0.6262

Log Loss: 0.9372

y\_pred\_df Animal.ID: [ 3 8 9 ... 109784 109785 109789]

y\_test\_df Animal.ID: [ 3 8 9 ... 109784 109785 109789]

Accuracy: 0.6544

Precision: 0.6291

Recall: 0.6579

F1 Score: 0.6244

Log Loss: 0.9479

y\_pred\_df Animal.ID: [ 12 14 19 ... 109777 109790 109793]

y\_test\_df Animal.ID: [ 12 14 19 ... 109777 109790 109793]

Accuracy: 0.6521

Precision: 0.6267

Recall: 0.6525

F1 Score: 0.6173

Log Loss: 0.9330

Average Metrics for Repetition 7/10:

Accuracy: 0.6520

Precision: 0.6286

Recall: 0.6550

F1\_score: 0.6200

Log\_loss: 0.9385

Cross-Validation Repeat: 8/10

y\_pred\_df Animal.ID: [ 29 33 36 ... 109781 109782 109790]

y\_test\_df Animal.ID: [ 29 33 36 ... 109781 109782 109790]

Accuracy: 0.6591

Precision: 0.6305

Recall: 0.6621

F1 Score: 0.6282

Log Loss: 0.9223

y\_pred\_df Animal.ID: [ 1 5 12 ... 109789 109792 109795]

y\_test\_df Animal.ID: [ 1 5 12 ... 109789 109792 109795]

Accuracy: 0.6496

Precision: 0.6285

Recall: 0.6496

F1 Score: 0.6138

Log Loss: 0.9399

y\_pred\_df Animal.ID: [ 2 3 4 ... 109783 109786 109794]

y\_test\_df Animal.ID: [ 2 3 4 ... 109783 109786 109794]

Accuracy: 0.6532

Precision: 0.6325

Recall: 0.6535

F1 Score: 0.6190

Log Loss: 0.9590

y\_pred\_df Animal.ID: [ 6 15 19 ... 109774 109779 109791]

y\_test\_df Animal.ID: [ 6 15 19 ... 109774 109779 109791]

Accuracy: 0.6444

Precision: 0.6149

Recall: 0.6445

F1 Score: 0.6094

Log Loss: 0.9375

y\_pred\_df Animal.ID: [ 0 10 11 ... 109785 109788 109793]

y\_test\_df Animal.ID: [ 0 10 11 ... 109785 109788 109793]

Accuracy: 0.6528

Precision: 0.6274

Recall: 0.6529

F1 Score: 0.6189

Log Loss: 0.9382

Average Metrics for Repetition 8/10:

Accuracy: 0.6518

Precision: 0.6267

Recall: 0.6525

F1\_score: 0.6179

Log\_loss: 0.9394

Cross-Validation Repeat: 9/10

y\_pred\_df Animal.ID: [ 1 7 10 ... 109778 109780 109791]

y\_test\_df Animal.ID: [ 1 7 10 ... 109778 109780 109791]

Accuracy: 0.6547

Precision: 0.6236

Recall: 0.6551

F1 Score: 0.6191

Log Loss: 0.9335

y\_pred\_df Animal.ID: [ 0 2 3 ... 109790 109793 109795]

y\_test\_df Animal.ID: [ 0 2 3 ... 109790 109793 109795]

Accuracy: 0.6519

Precision: 0.6231

Recall: 0.6521

F1 Score: 0.6169

Log Loss: 0.9443

y\_pred\_df Animal.ID: [ 5 11 12 ... 109787 109792 109794]

y\_test\_df Animal.ID: [ 5 11 12 ... 109787 109792 109794]

Accuracy: 0.6465

Precision: 0.6215

Recall: 0.6468

F1 Score: 0.6129

Log Loss: 0.9521

y\_pred\_df Animal.ID: [ 8 14 15 ... 109763 109773 109774]

y\_test\_df Animal.ID: [ 8 14 15 ... 109763 109773 109774]

Accuracy: 0.6573

Precision: 0.6318

Recall: 0.6641

F1 Score: 0.6304

Log Loss: 0.9288

y\_pred\_df Animal.ID: [ 6 13 16 ... 109760 109768 109789]

y\_test\_df Animal.ID: [ 6 13 16 ... 109760 109768 109789]

Accuracy: 0.6486

Precision: 0.6249

Recall: 0.6550

F1 Score: 0.6189

Log Loss: 0.9350

Average Metrics for Repetition 9/10:

Accuracy: 0.6518

Precision: 0.6250

Recall: 0.6546

F1\_score: 0.6196

Log\_loss: 0.9387

Cross-Validation Repeat: 10/10

y\_pred\_df Animal.ID: [ 14 22 24 ... 109782 109787 109788]

y\_test\_df Animal.ID: [ 14 22 24 ... 109782 109787 109788]

Accuracy: 0.6529

Precision: 0.6254

Recall: 0.6561

F1 Score: 0.6204

Log Loss: 0.9357

y\_pred\_df Animal.ID: [ 4 8 11 ... 109790 109792 109793]

y\_test\_df Animal.ID: [ 4 8 11 ... 109790 109792 109793]

Accuracy: 0.6548

Precision: 0.6284

Recall: 0.6550

F1 Score: 0.6195

Log Loss: 0.9334

y\_pred\_df Animal.ID: [ 2 3 7 ... 109775 109784 109785]

y\_test\_df Animal.ID: [ 2 3 7 ... 109775 109784 109785]

Accuracy: 0.6517

Precision: 0.6211

Recall: 0.6518

F1 Score: 0.6170

Log Loss: 0.9322

y\_pred\_df Animal.ID: [ 0 1 5 ... 109762 109786 109794]

y\_test\_df Animal.ID: [ 0 1 5 ... 109762 109786 109794]

Accuracy: 0.6509

Precision: 0.6262

Recall: 0.6578

F1 Score: 0.6236

Log Loss: 0.9341

y\_pred\_df Animal.ID: [ 6 10 35 ... 109783 109791 109795]

y\_test\_df Animal.ID: [ 6 10 35 ... 109783 109791 109795]

Accuracy: 0.6500

Precision: 0.6241

Recall: 0.6529

F1 Score: 0.6183

Log Loss: 0.9379

Average Metrics for Repetition 10/10:

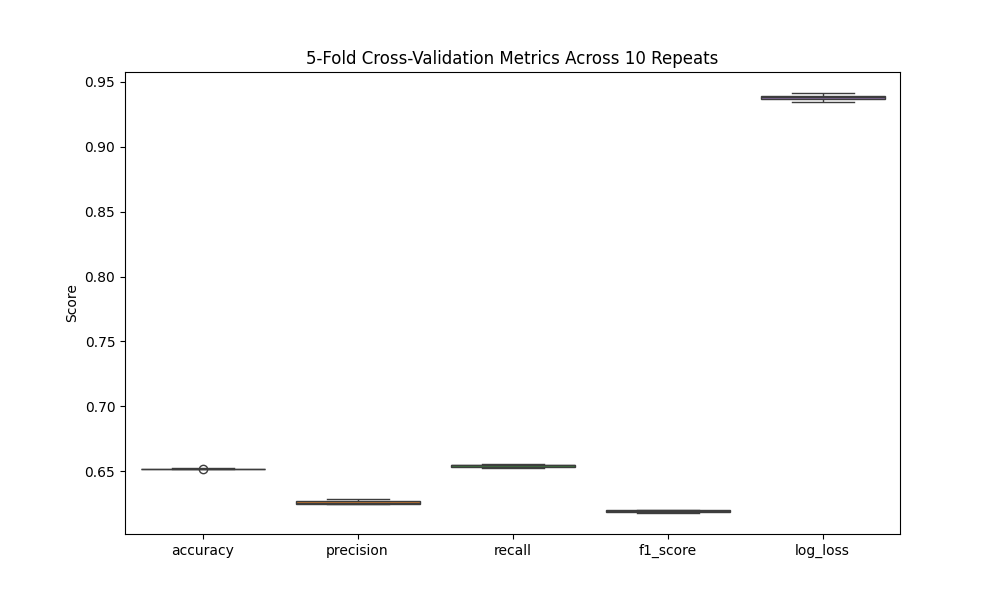
Accuracy: 0.6521

Precision: 0.6250

Recall: 0.6547

F1\_score: 0.6198

Log\_loss: 0.9346



Greater log loss and lower other metrics for multi-class logreg with pca than without pca.