

```
In [ ]: import os
import random

import numpy as np
import pandas as pd

from skimage import io

from sklearn.model_selection import train_test_split
from sklearn.linear_model import Perceptron
from sklearn.metrics import accuracy_score

import matplotlib.pyplot as plt
import seaborn as sns
```

```
In [ ]: # Pytorch
import torch, torchvision, torch.utils
from torch import Tensor
from torch import cat
from torch.autograd.grad_mode import no_grad
from torch.utils.data import DataLoader
from torchvision import datasets, transforms
import torch.optim as optim
from torch.nn import (
    Module,
    Conv2d,
    Linear,
    Dropout2d,
    NLLLoss, BCELoss, CrossEntropyLoss, MSELoss,
    MaxPool2d,
    Flatten,
    Sequential,
    ReLU,
)

import torch.nn.functional as F
from torchviz import make_dot
from torchsummary import summary
from sklearn.metrics import accuracy_score, ConfusionMatrixDisplay, RocCurveDisplay, c
import time
```

```
In [ ]: def matrix_confusion(yt, yp, time_taken):
    data = {'Y_Real': yt,
            'Y_Pred': yp}

    df = pd.DataFrame(data, columns=['Y_Real', 'Y_Pred'])
    confusion_matrix = pd.crosstab(df['Y_Real'], df['Y_Pred'], rownames=['Real'],
                                    colnames=['Predicted'])
    sns.heatmap(confusion_matrix, annot=True, fmt='g')

    plt.show()
    y_val = df['Y_Real'].to_numpy()
    predictions = df['Y_Pred'].to_numpy()
    accuracy = accuracy_score(y_val, predictions)
    precision = precision_score(y_val, predictions)
    recall = recall_score(y_val, predictions)
    f1 = f1_score(y_val, predictions)
    print('Time taken: ', time_taken)
    print('Test size:', len(y_val))
    print('Total Accuracy: ', accuracy)
    print('Total Precision: ', precision)
    print('Total Recall: ', recall)
```

```

        print('Total F1 Score: ',f1)
        print("Classification Report:\n")
        print(classification_report(y_val,predictions))

    return time_taken,accuracy,precision,recall,f1

```

In [ ]: `torch.cuda.is_available()`

Out[ ]: `True`

In [ ]: `train_data = torchvision.datasets.ImageFolder('C:/Users/rjuya/OneDrive/Desktop/github/Pneumonia-Detection/dataset/training')  
test_data = torchvision.datasets.ImageFolder('C:/Users/rjuya/OneDrive/Desktop/github/Pneumonia-Detection/dataset/validation')  
valid_data = torchvision.datasets.ImageFolder('C:/Users/rjuya/OneDrive/Desktop/github/Pneumonia-Detection/dataset/test')`

In [ ]: `train_data[0][0].shape`

Out[ ]: `torch.Size([3, 640, 640])`

In [ ]: `train_loader = DataLoader(train_data, shuffle=True, batch_size=8)  
test_loader = DataLoader(valid_data, shuffle=True, batch_size=1)  
hold_out_test_loader = DataLoader(test_data, shuffle=True, batch_size=1)`

In [ ]: `# Normal (0) and True, Pneumonia (1)  
print((train_loader.dataset.class_to_idx))  
print((test_loader.dataset.class_to_idx))  
print((hold_out_test_loader.dataset.class_to_idx))`

```

{'NORMAL': 0, 'PNEUMONIA': 1}
{'NORMAL': 0, 'PNEUMONIA': 1}
{'NORMAL': 0, 'PNEUMONIA': 1}

```

In [ ]: `n_samples_show = 6`

```

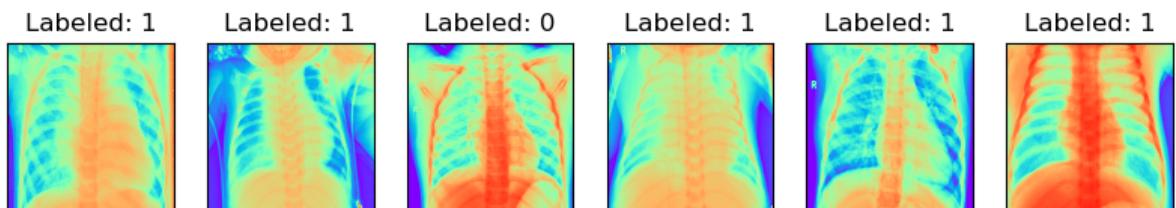
data_iter = iter(train_loader)
fig, axes = plt.subplots(nrows=1, ncols=n_samples_show, figsize=(10, 10))

while n_samples_show > 0:
    images, targets = data_iter.__next__()

    axes[n_samples_show - 1].imshow(images[0, 0].numpy().squeeze(), cmap=plt.cm.rainbow)
    axes[n_samples_show - 1].set_xticks([])
    axes[n_samples_show - 1].set_yticks([])
    axes[n_samples_show - 1].set_title(f'Labeled: {targets[0].item()}')

    n_samples_show -= 1

```



In [ ]: `class LogisticRegression(Module):  
 def __init__(self,input_size,num_classes):  
 super(LogisticRegression,self).__init__()  
 self.linear = Linear(input_size,num_classes)  
  
 def forward(self,x):`

```
    x = x.view(x.size(0), -1)
    return torch.sigmoid(self.linear(x))
```

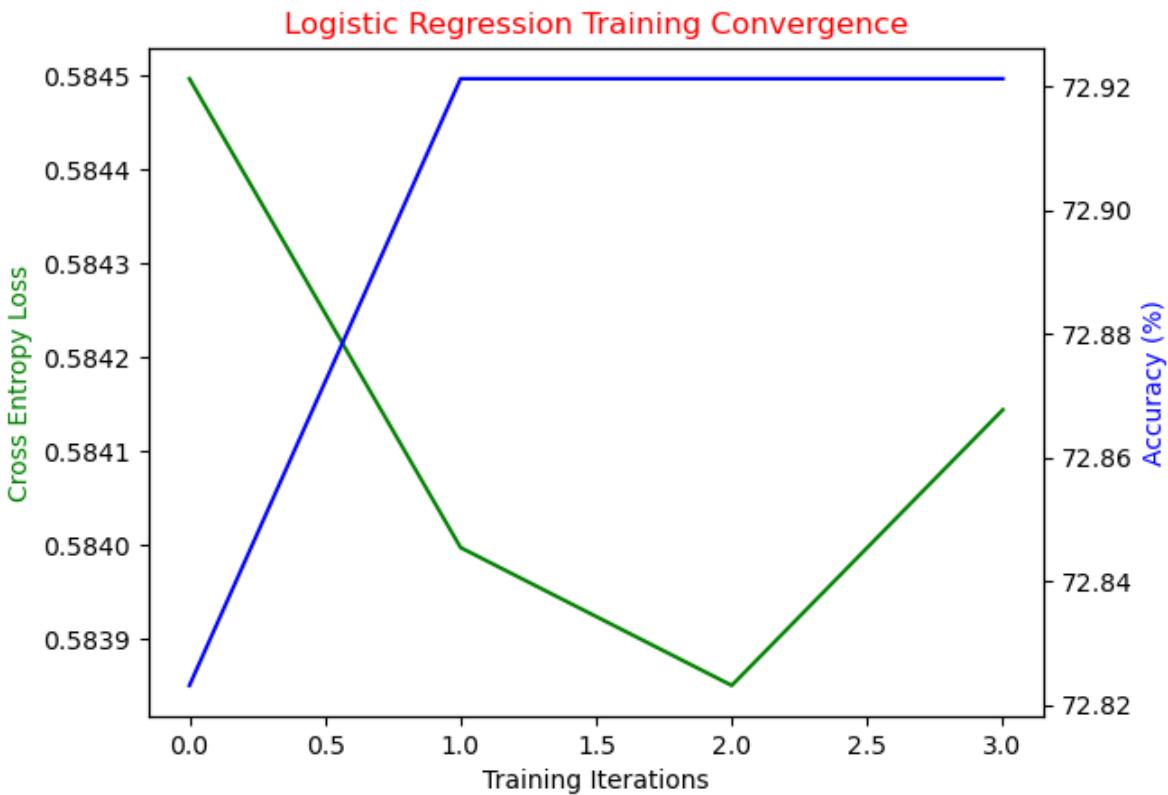
```
In [ ]: input_size = 640*640*3 #Size of image
         num_classes = 2 #the image number are in range 0-10
         epochs = 4 #one cycle through the full train data
         # batch_size = 100 #sample size consider before updating the model's weights
         learning_rate = 0.001 #step size to update parameter
```

```
In [ ]: model = LogisticRegression(input_size,num_classes)
         loss_func = CrossEntropyLoss()
         optimizer = optim.SGD(model.parameters(),lr=learning_rate)
```

```
In [ ]: tic = time.time()
         loss_list = []
         total_accuracy = []
         for epoch in range(epochs):
             correct = 0
             total_loss = []
             batch_size = 0
             for i, (images, labels) in enumerate(train_loader):
                 batch_size+=1
                 optimizer.zero_grad()
                 # print(images.shape)
                 # print(images.view(-1, input_size).shape)
                 output = model(images)
                 loss = loss_func(output, labels)
                 # Loss.append(Loss.item())
                 loss.backward()
                 optimizer.step()
                 total_loss.append(loss.item())
                 train_pred = output.argmax(dim=1, keepdim=True)
                 correct += train_pred.eq(labels.view_as(train_pred)).sum().item()
             loss_list.append(sum(total_loss) / len(total_loss))
             accuracy = 100 * correct / 4077 # No. of training examples = 4077
             total_accuracy.append(accuracy)
             print(f"Training [{100.0 * (epoch + 1)} / {epochs:.0f}]\tLoss: {loss_list[-1]:.4f}\nAccuracy: {accuracy:.2f}%\n")
         toc = time.time()
         time_taken = toc-tic
         print('Time taken: ',time_taken)
```

```
Training [25%]  Loss: 0.5845    Accuracy: 72.82%
Training [50%]  Loss: 0.5840    Accuracy: 72.92%
Training [75%]  Loss: 0.5838    Accuracy: 72.92%
Training [100%] Loss: 0.5841    Accuracy: 72.92%
Time taken:  85.73757076263428
```

```
In [ ]: fig, ax1 = plt.subplots()
         ax1.plot(loss_list, 'g-')
         ax2 = ax1.twinx()
         ax2.plot(total_accuracy, 'b')
         plt.title("Logistic Regression Training Convergence", color='red')
         ax1.set_xlabel("Training Iterations")
         ax1.set_ylabel("Cross Entropy Loss", color='g')
         ax2.set_ylabel("Accuracy (%)", color='b')
         plt.show()
```



```
In [ ]: model_path = 'C:/Users/rjuya/OneDrive/Desktop/github stuff/EE5610/Project/Models/lc'

In [ ]: torch.save(model.state_dict(), model_path)

In [ ]: model_temp = LogisticRegression(input_size,num_classes)
model_temp.load_state_dict(torch.load(model_path))

Out[ ]: <All keys matched successfully>

In [ ]: batch_size=1

model_temp.eval()
pred_targets = []
test_targets= []
with no_grad():

    correct = 0
    for batch_idx, (data, target) in enumerate(test_loader):
        output = model_temp(data)
        if len(output.shape) == 1:
            output = output.reshape(1, *output.shape)
        pred = output.argmax(dim=1, keepdim=True)
        pred_targets.append(pred.item())
        test_targets.append(target.item())
        correct += pred.eq(target.view_as(pred)).sum().item()

        loss = loss_func(output, target)
        total_loss.append(loss.item())

    print(f"Performance on test data:\n\tLoss: {sum(total_loss) / len(total_loss)}")
    print(test_targets)
    print(pred_targets)
```

Performance on test data:

Loss: 0.5772

Accuracy: 73.91%

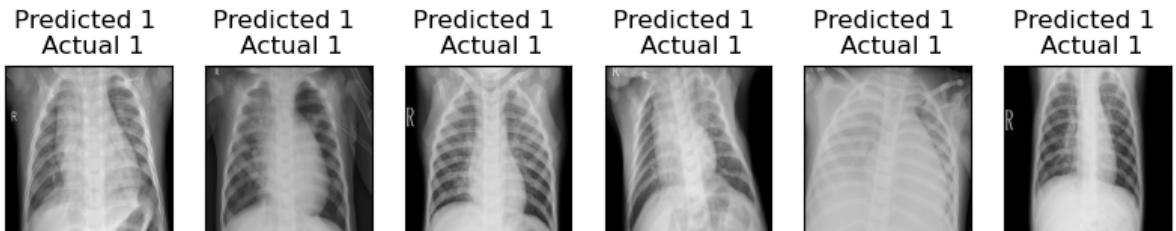
```
In [ ]: from PIL import Image
#abc
n_samples_show = 6
count = 0
fig, axes = plt.subplots(nrows=1, ncols=n_samples_show, figsize=(10, 3))

model_temp.eval()
with no_grad():
    for batch_idx, (data, target) in enumerate(test_loader):
        if count == n_samples_show:
            break
        output = model_temp(data[0:1])
        if len(output.shape) == 1:
            output = output.reshape(3, *output.shape)

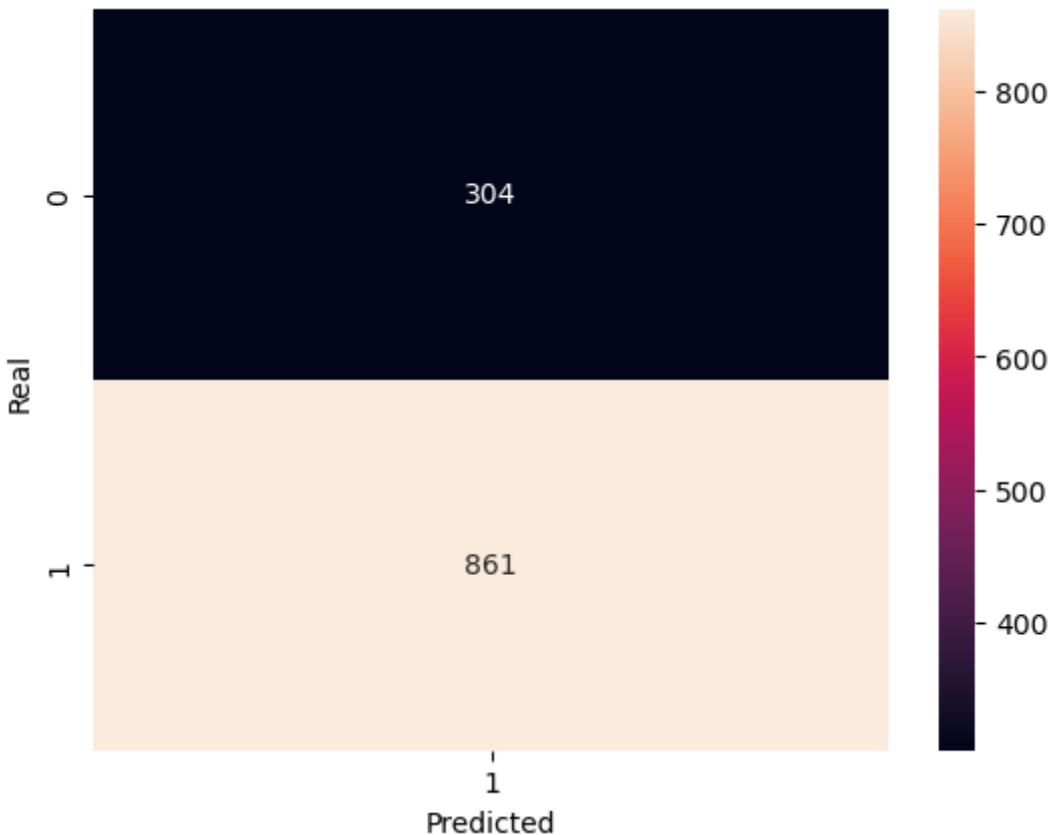
        pred = output.argmax(dim=1, keepdim=True)
        test_targets2 = target.item()
        axes[count].imshow(torchvision.transforms.ToPILImage(mode='RGB')(data[0].sc

        axes[count].set_xticks([])
        axes[count].set_yticks([])
        axes[count].set_title("Predicted {} \n Actual {}".format(pred.item(),test_t

        count += 1
```



```
In [ ]: val_logreg = matrix_confusion(test_targets, pred_targets, time_taken)
```



Time taken: 85.73757076263428

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

In [ ]: out = pd.DataFrame([val\_logreg],  
                       index = ['Logistic Regression'],

```
columns=['Time','Accuracy','Precision','Recall','F1 score'])  
out.sort_values('Time')
```

Out[ ]:

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>	85.737571	0.739056	0.739056	1.0	0.849951

In [ ]:

```
import pickle  
from IPython.display import display
```

In [ ]:

```
batch_sizes = [16, 32, 64]  
num_epochs_list = [10,20,30]  
learning_rates = [0.0001,0.001, 0.01, 0.1,1]  
optimizers = ['SGD','Adam']
```

In [ ]:

```
input_size = 640*640*3 #Size of image  
num_classes = 2 #the image number are in range 0-10
```

In [ ]:

```
number_done = 0  
for size in batch_sizes:  
    train_loader = DataLoader(train_data, shuffle=True, batch_size=size)  
    test_loader = DataLoader(valid_data, shuffle=True, batch_size=1)  
    for epochs in num_epochs_list:  
        for learning_rate in learning_rates:  
            for optimizer_name in optimizers:  
                print(f"Training with batch size: {size}, epochs: {epochs}, learning rate: {learning_rate}, optimizer: {optimizer_name}")  
                number_done+=1  
                print(f"Current: {number_done}/90")  
                # Define logistic regression model  
                model = LogisticRegression(input_size,num_classes)  
                loss_func = CrossEntropyLoss()  
                if optimizer_name == 'SGD':  
                    optimizer = optim.SGD(model.parameters(),lr=learning_rate)  
                else:  
                    optimizer = optim.Adam(model.parameters(),lr=learning_rate)  
  
                # Training Loop  
                tic = time.time()  
                loss_list = []  
                total_accuracy = []  
                for epoch in range(epochs):  
                    correct = 0  
                    total_loss = []  
                    batch_size = 0  
                    for i, (images, labels) in enumerate(train_loader):  
                        batch_size+=1  
                        optimizer.zero_grad()  
                        # print(images.shape)  
                        # print(images.view(-1, input_size).shape)  
                        output = model(images)  
                        loss = loss_func(output, labels)  
                        # Loss.append(Loss.item())  
                        loss.backward()  
                        optimizer.step()
```

```

        total_loss.append(loss.item())
        train_pred = output.argmax(dim=1, keepdim=True)
        correct += train_pred.eq(labels.view_as(train_pred)).sum()
    loss_list.append(sum(total_loss) / len(total_loss))
    accuracy = 100 * correct / 4077 # No. of training examples = 4077
    total_accuracy.append(accuracy)
    print(f"Training [{100.0 * (epoch + 1) / epochs:.0f}]\tLoss: {loss_list[-1]:.4f}\tAccuracy: {total_accuracy[-1]:.2f}%")

# Evaluate the model on the test set
tic = time.time()
time_taken = toc-tic
print('Time taken: ',time_taken)

fig, ax1 = plt.subplots()
ax1.plot(loss_list, 'g-')
ax2 = ax1.twinx()
ax2.plot(total_accuracy, 'b')
plt.title("Logistic Regression Training Convergence", color='red')
ax1.set_xlabel("Training Iterations")
ax1.set_ylabel("Cross Entropy Loss", color='g')
ax2.set_ylabel("Accuracy (%)", color='b')
plt.show()

model_path = f"C:/Users/rjuya/OneDrive/Desktop/github stuff/EE5610/LogisticRegression.pt"
torch.save(model.state_dict(), model_path)

model_temp = LogisticRegression(input_size,num_classes)
model_temp.load_state_dict(torch.load(model_path))
batch_size=1

model_temp.eval()
pred_targets = []
test_targets= []

with no_grad():

    correct = 0
    for batch_idx, (data, target) in enumerate(test_loader):
        output = model_temp(data)
        if len(output.shape) == 1:
            output = output.reshape(1, *output.shape)
        pred = output.argmax(dim=1, keepdim=True)
        pred_targets.append(pred.item())
        test_targets.append(target.item())
        correct += pred.eq(target.view_as(pred)).sum().item()

        loss = loss_func(output, target)
        total_loss.append(loss.item())

    print(f"Performance on test data:\n\tLoss: {sum(total_loss) / len(total_loss)}\n\tAccuracy: {correct / len(test_targets):.2f}%")

from PIL import Image
#abc
n_samples_show = 6
count = 0
fig, axes = plt.subplots(nrows=1, ncols=n_samples_show, figsize=(10, 8))

model_temp.eval()
with no_grad():
    for batch_idx, (data, target) in enumerate(test_loader):
        if count == n_samples_show:
            break
        axes[0].imshow(data[0])
        axes[0].set_title(f"Label: {target[0]}")
        count += 1

```

```

        output = model_temp(data[0:1])
        if len(output.shape) == 1:
            output = output.reshape(3, *output.shape)

    pred = output.argmax(dim=1, keepdim=True)
    test_targets2 = target.item()
    axes[count].imshow(torchvision.transforms.ToPILImage(mode='RGB')(pred))

    axes[count].set_xticks([])
    axes[count].set_yticks([])
    axes[count].set_title("Predicted {} \n Actual {}".format(pred, test_targets2))

    count += 1

plt.show()
name_logreg = f"Logistic Regression model_batch{size}_epochs{epochs}_lr{learning_rate}_optimizer{optimizer}.pkl"
val_logreg = matrix_confusion(test_targets, pred_targets, time_taker)
out = pd.DataFrame([val_logreg],
                    index = [name_logreg],
                    columns=['Time', 'Accuracy', 'Precision', 'Recall', 'F1'])
out.sort_values('Time')
display(out)

filepath1 = f"C:/Users/rjuya/OneDrive/Desktop/github stuff/EE5610/Final Project/Logistic Regression Model/{name_logreg}"
with open(filepath1, 'wb') as file:
    # Serialize and write the variable to the file
    pickle.dump(out, file)
    print("Data Stored Successfully")

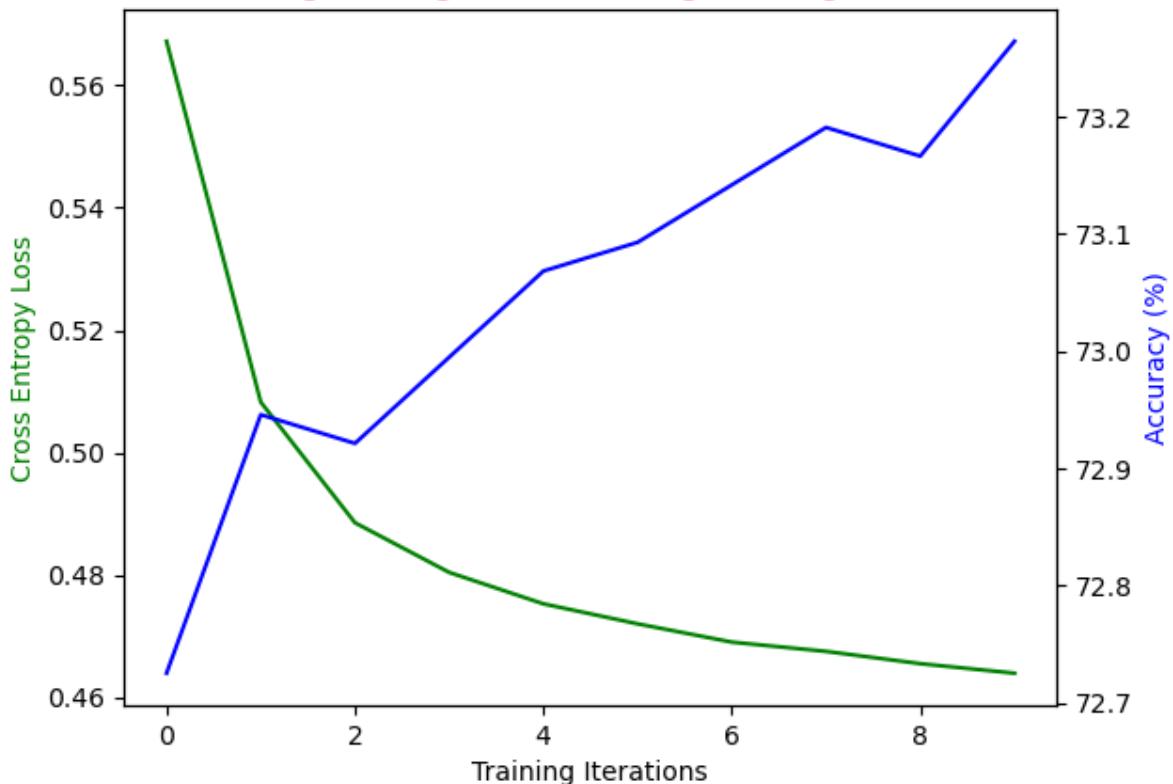
```

Training with batch size: 16, epochs: 10, learning rate: 0.0001, optimizer: SGD  
 Current: 1/90

Training [%]	Loss	Accuracy
[10%]	0.5672	72.73%
[20%]	0.5082	72.95%
[30%]	0.4885	72.92%
[40%]	0.4804	72.99%
[50%]	0.4753	73.07%
[60%]	0.4720	73.09%
[70%]	0.4690	73.14%
[80%]	0.4675	73.19%
[90%]	0.4655	73.17%
[100%]	0.4639	73.26%

Time taken: 189.16188311576843

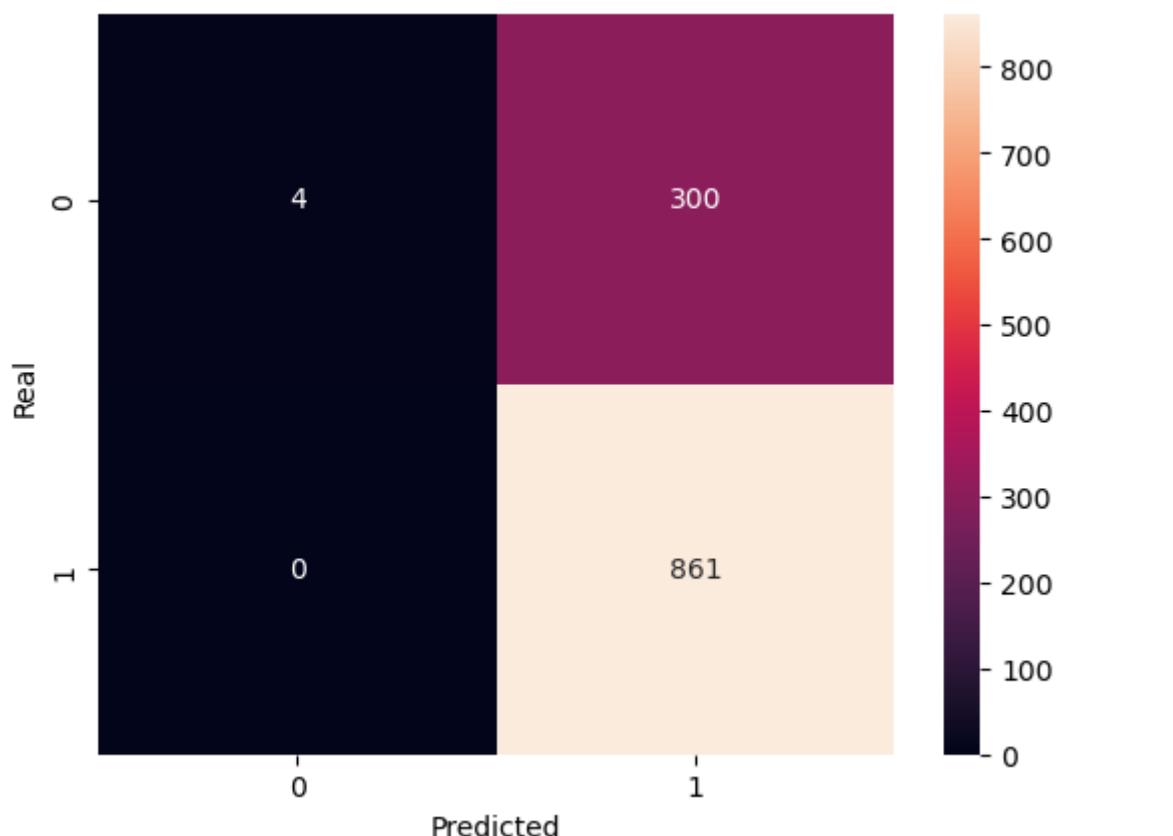
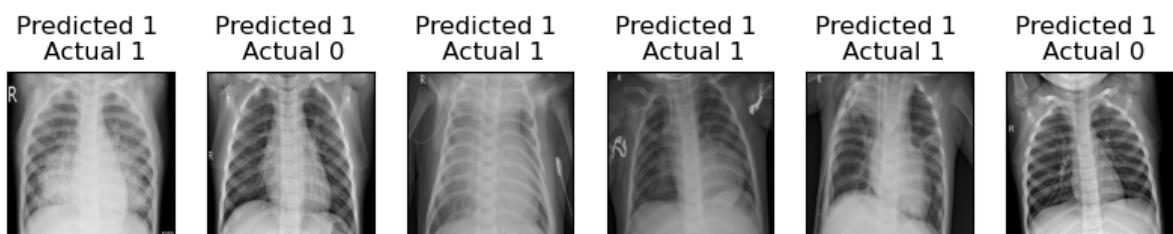
## Logistic Regression Training Convergence



Performance on test data:

Loss: 0.4564

Accuracy: 74.25%



```

Time taken: 189.16188311576843
Test size: 1165
Total Accuracy: 0.7424892703862661
Total Precision: 0.7416020671834626
Total Recall: 1.0
Total F1 Score: 0.8516320474777448
Classification Report:

```

	precision	recall	f1-score	support
0	1.00	0.01	0.03	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.87	0.51	0.44	1165
weighted avg	0.81	0.74	0.64	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs10_lr0.0001_optimizerSGD</b>	189.161883	0.742489	0.741602	1.0	0.851632

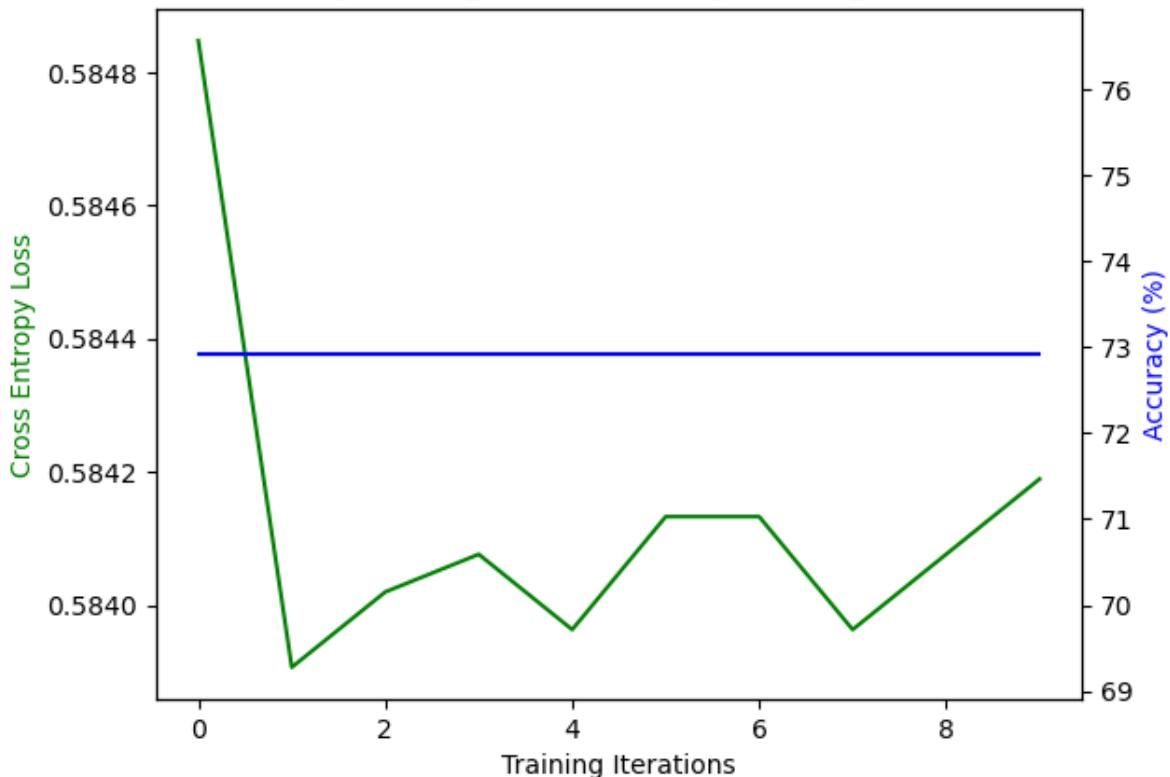
Data Stored Successfully

Training with batch size: 16, epochs: 10, learning rate: 0.0001, optimizer: Adam  
Current: 2/90

Training [10%] Loss: 0.5848 Accuracy: 72.92%  
 Training [20%] Loss: 0.5839 Accuracy: 72.92%  
 Training [30%] Loss: 0.5840 Accuracy: 72.92%  
 Training [40%] Loss: 0.5841 Accuracy: 72.92%  
 Training [50%] Loss: 0.5840 Accuracy: 72.92%  
 Training [60%] Loss: 0.5841 Accuracy: 72.92%  
 Training [70%] Loss: 0.5841 Accuracy: 72.92%  
 Training [80%] Loss: 0.5840 Accuracy: 72.92%  
 Training [90%] Loss: 0.5841 Accuracy: 72.92%  
 Training [100%] Loss: 0.5842 Accuracy: 72.92%

Time taken: 230.20081782341003

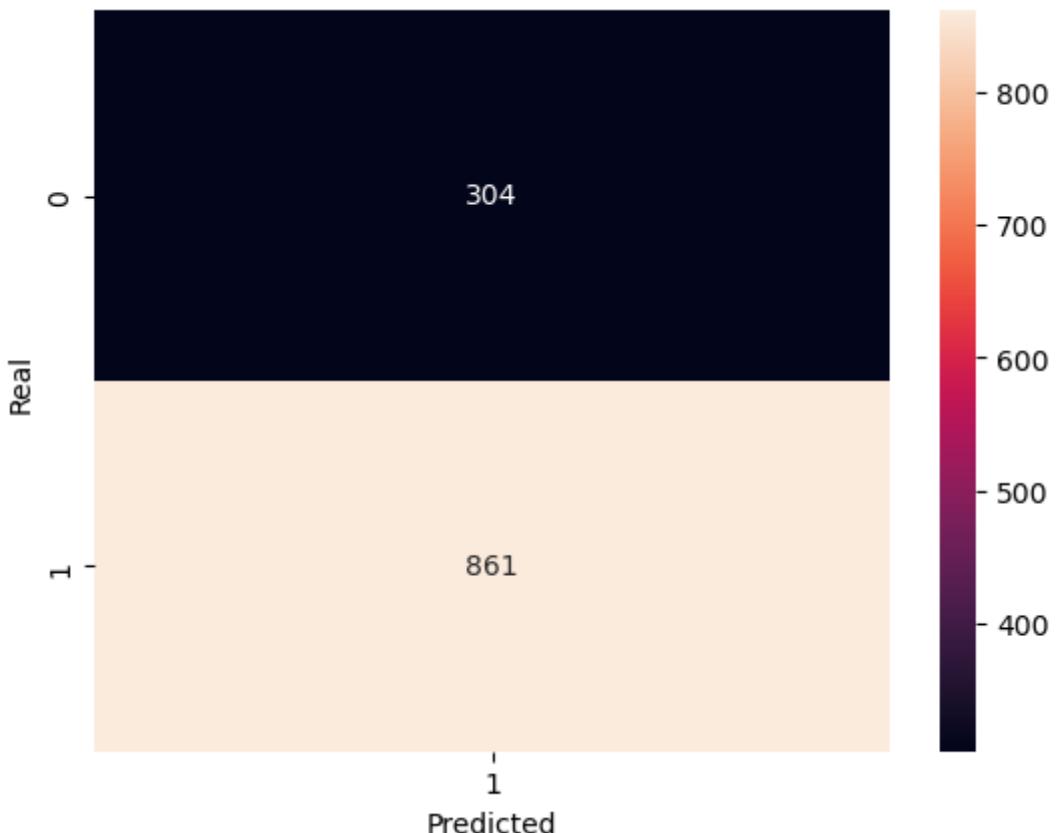
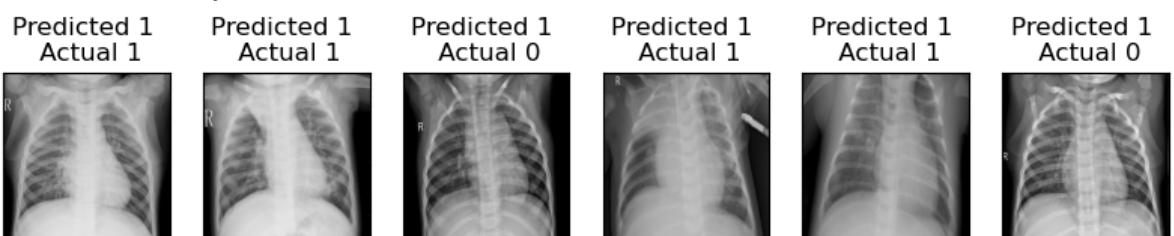
Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 230.20081782341003

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch16_epochs10_lr0.0001_optimizerAdam</b>	230.200818	0.739056	0.739056	1.0	0.849951

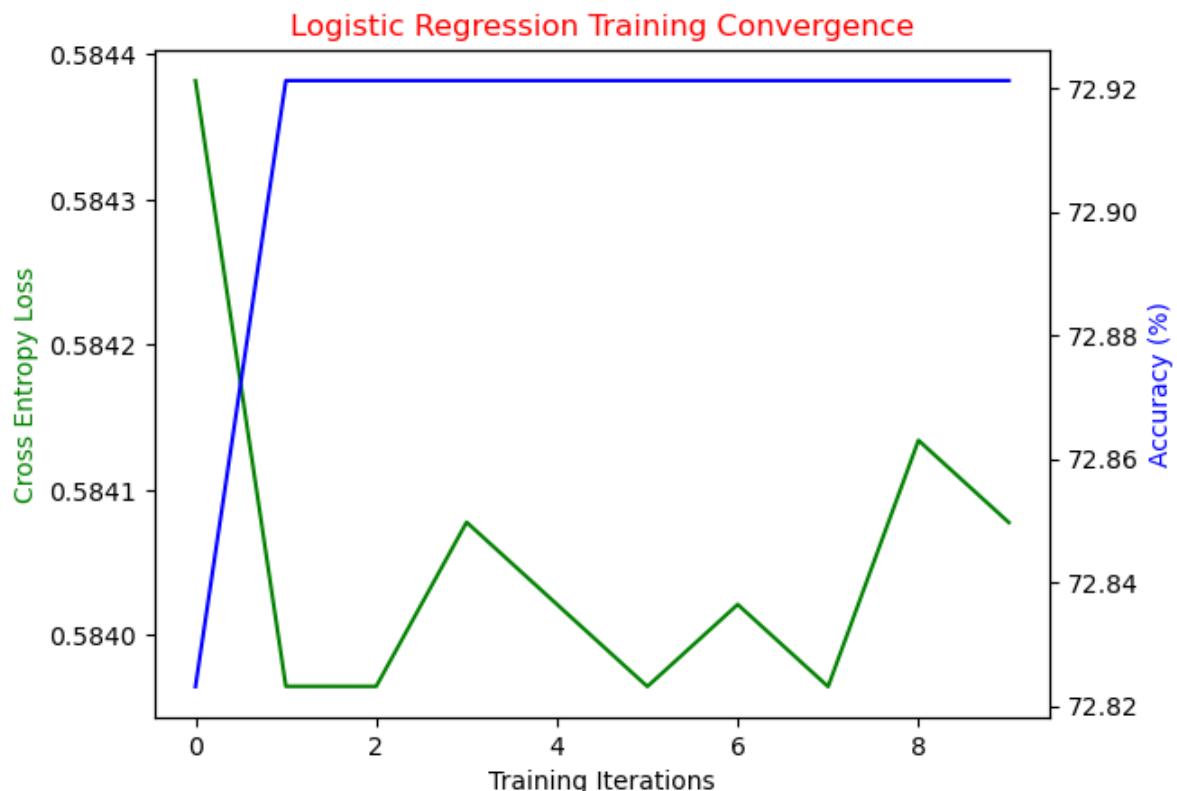
Data Stored Successfully

Training with batch size: 16, epochs: 10, learning rate: 0.001, optimizer: SGD

Current: 3/90

Training [10%]	Loss: 0.5844	Accuracy: 72.82%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

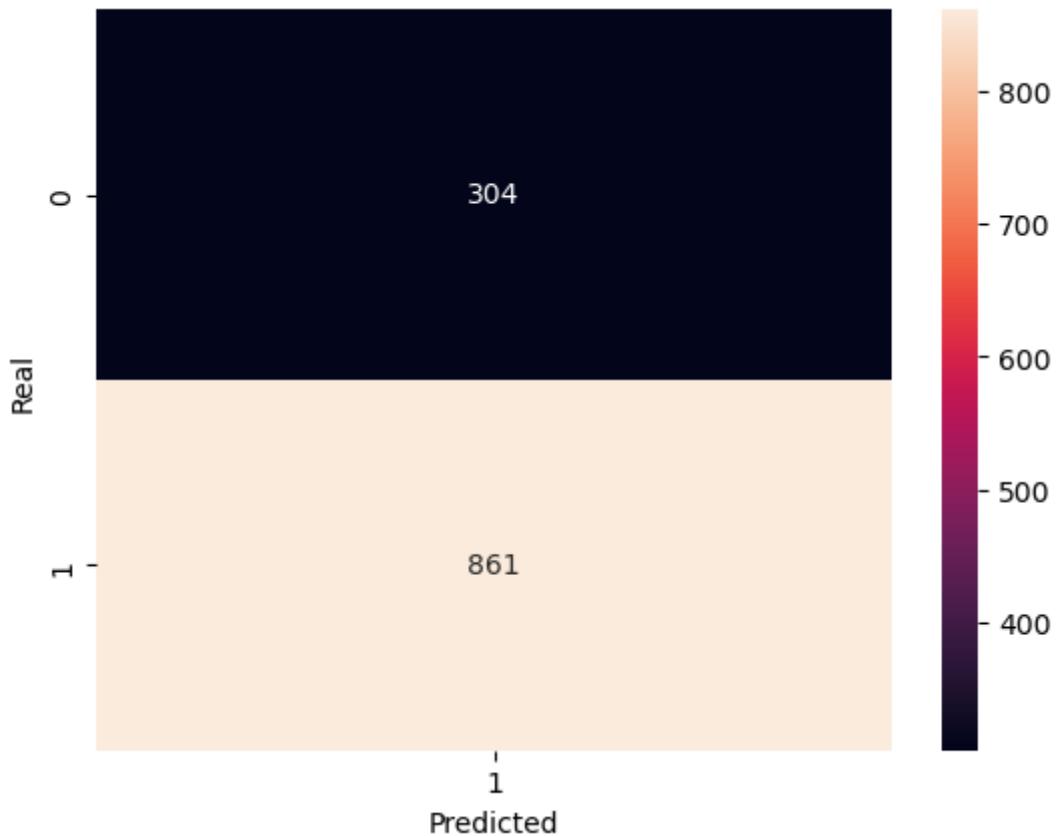
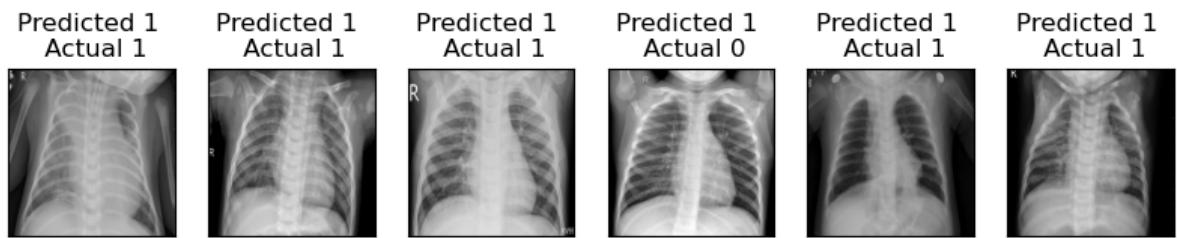
Time taken: 193.41015458106995



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 193.41015458106995  
 Test size: 1165  
 Total Accuracy: 0.7390557939914163  
 Total Precision: 0.7390557939914163  
 Total Recall: 1.0  
 Total F1 Score: 0.8499506416584404  
 Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

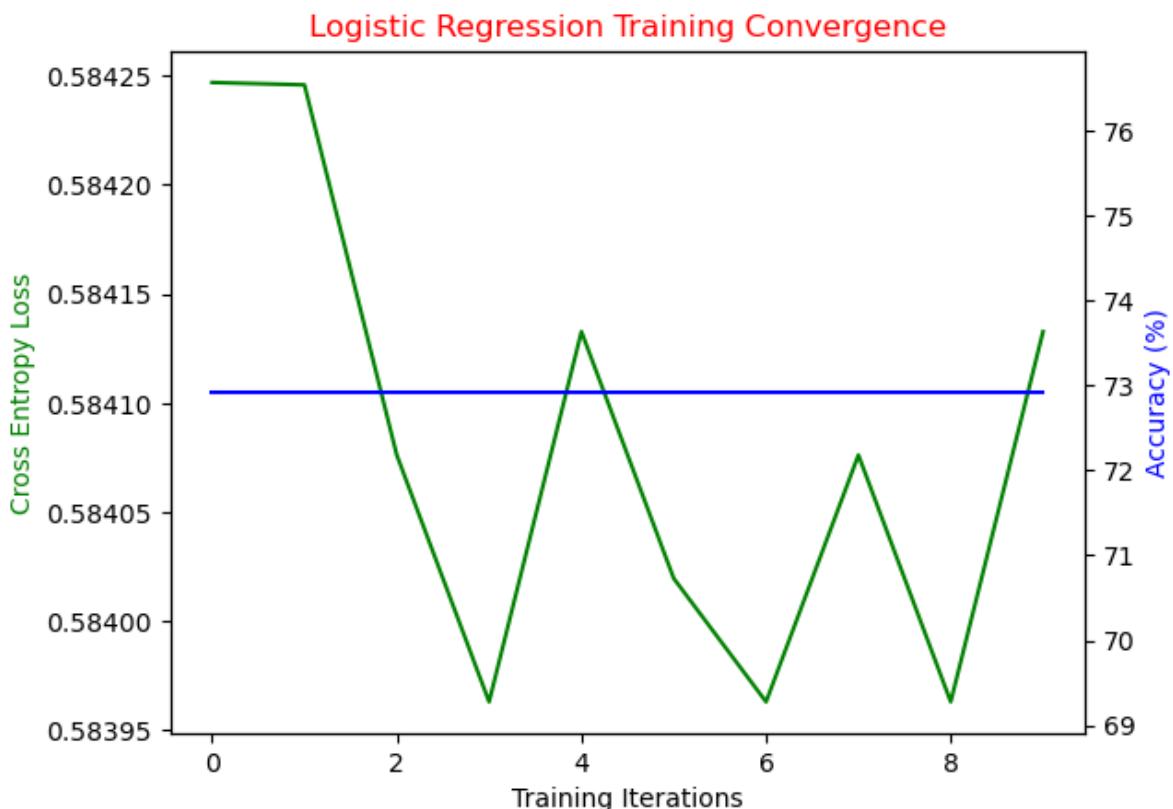
```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

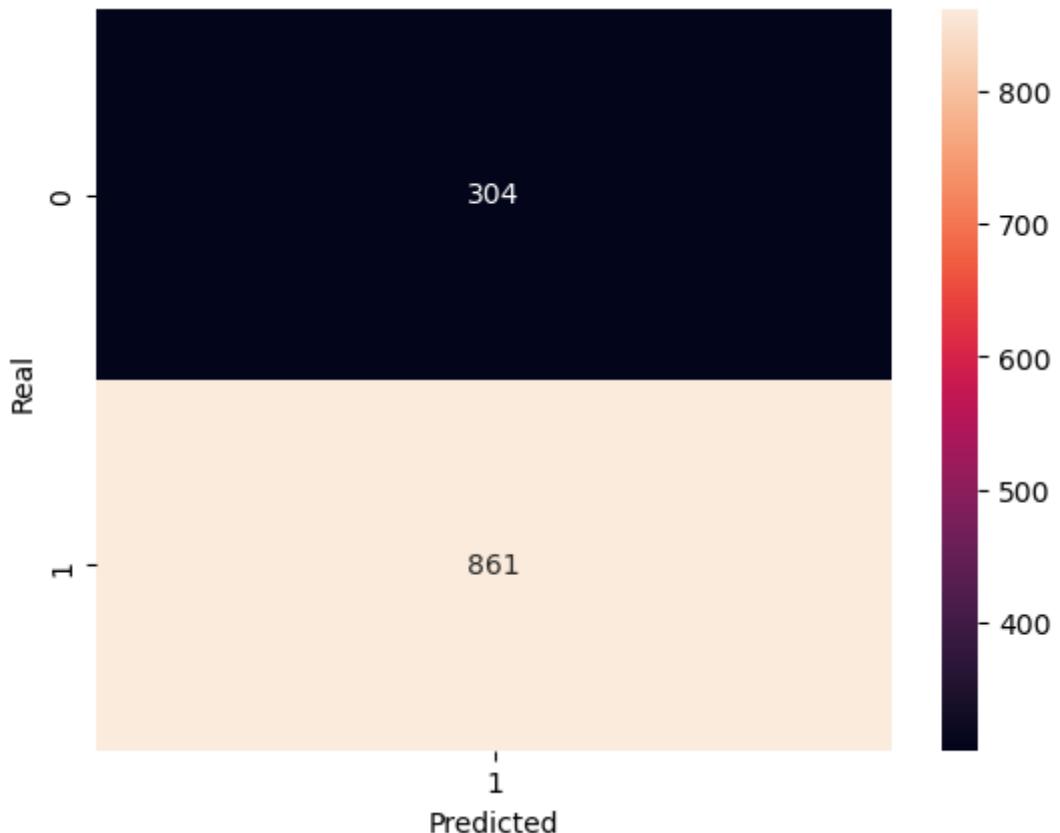
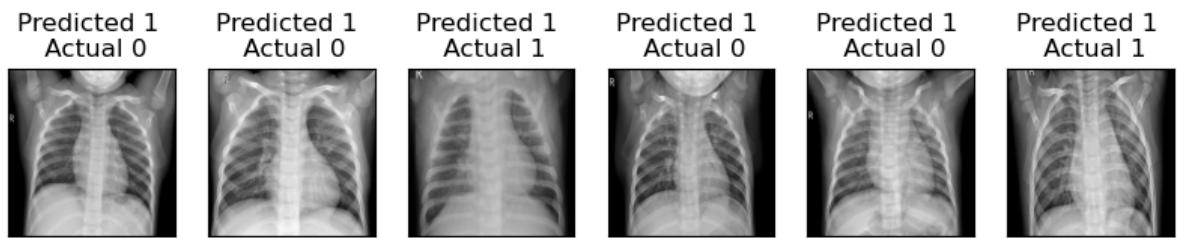
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch16_epochs10_lr0.001_optimizerSGD</b>	193.410155	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 16, epochs: 10, learning rate: 0.001, optimizer: Adam  
Current: 4/90  
Training [10%] Loss: 0.5842 Accuracy: 72.92%  
Training [20%] Loss: 0.5842 Accuracy: 72.92%  
Training [30%] Loss: 0.5841 Accuracy: 72.92%  
Training [40%] Loss: 0.5840 Accuracy: 72.92%  
Training [50%] Loss: 0.5841 Accuracy: 72.92%  
Training [60%] Loss: 0.5840 Accuracy: 72.92%  
Training [70%] Loss: 0.5840 Accuracy: 72.92%  
Training [80%] Loss: 0.5841 Accuracy: 72.92%  
Training [90%] Loss: 0.5840 Accuracy: 72.92%  
Training [100%] Loss: 0.5841 Accuracy: 72.92%  
Time taken: 228.5272650718689



Performance on test data:

Loss: 0.5760  
Accuracy: 73.91%



Time taken: 228.5272650718689  
Test size: 1165  
Total Accuracy: 0.7390557939914163  
Total Precision: 0.7390557939914163  
Total Recall: 1.0  
Total F1 Score: 0.8499506416584404  
Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch16_epochs10_lr0.001_optimizerAdam</b>	228.527265	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

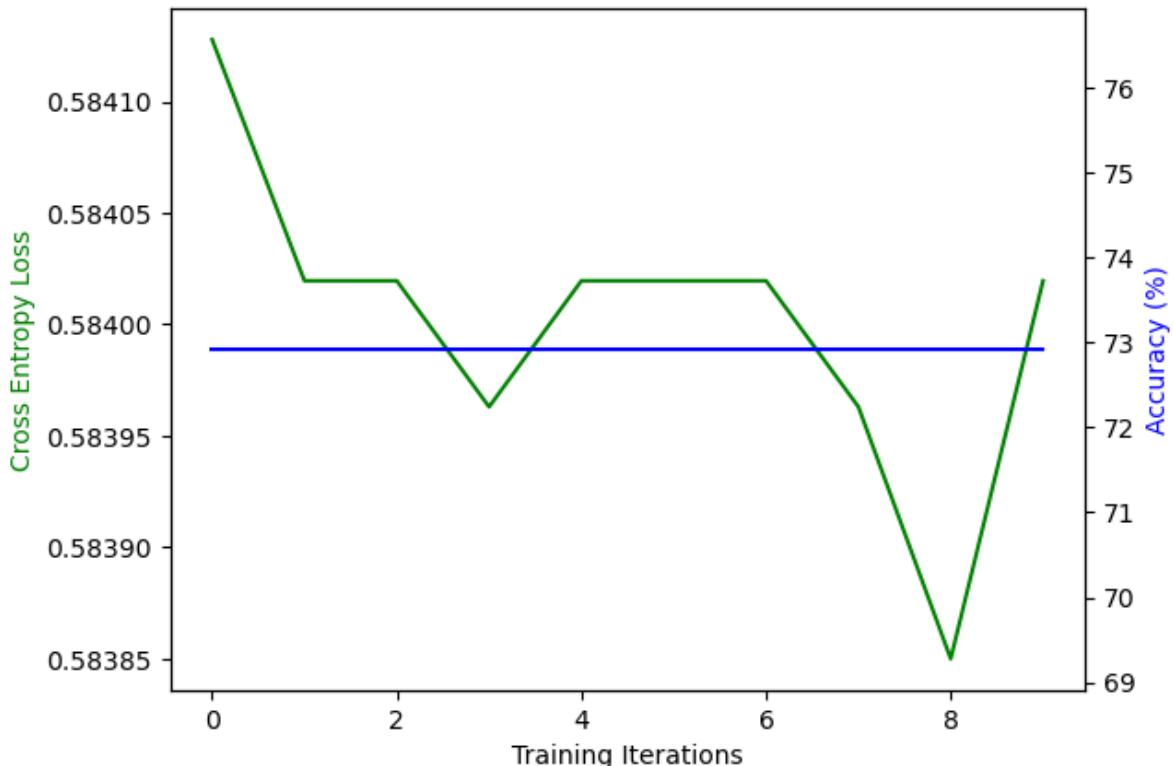
Training with batch size: 16, epochs: 10, learning rate: 0.01, optimizer: SGD

Current: 5/90

Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5838	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 198.85651850700378

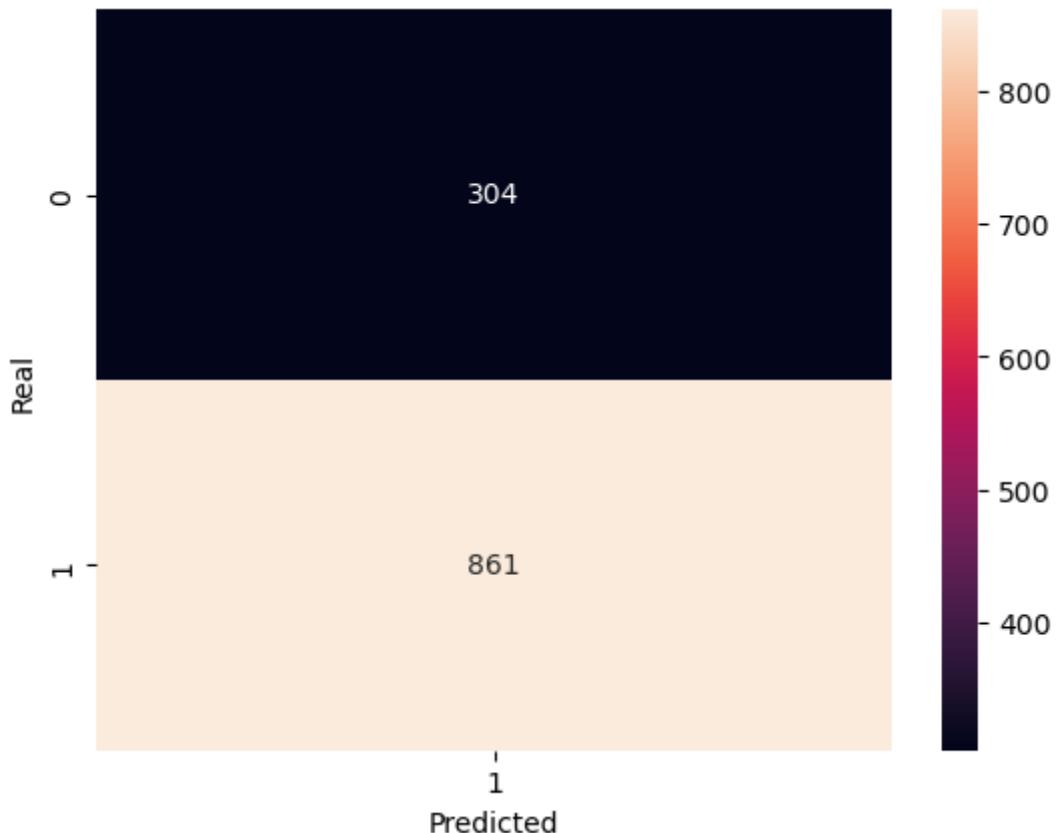
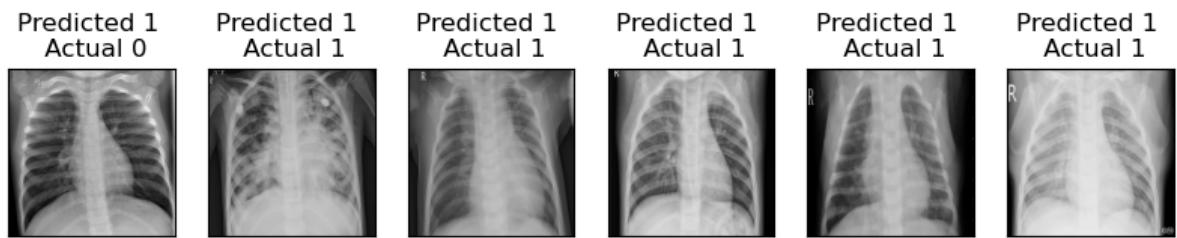
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 198.85651850700378  
 Test size: 1165  
 Total Accuracy: 0.7390557939914163  
 Total Precision: 0.7390557939914163  
 Total Recall: 1.0  
 Total F1 Score: 0.8499506416584404  
 Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

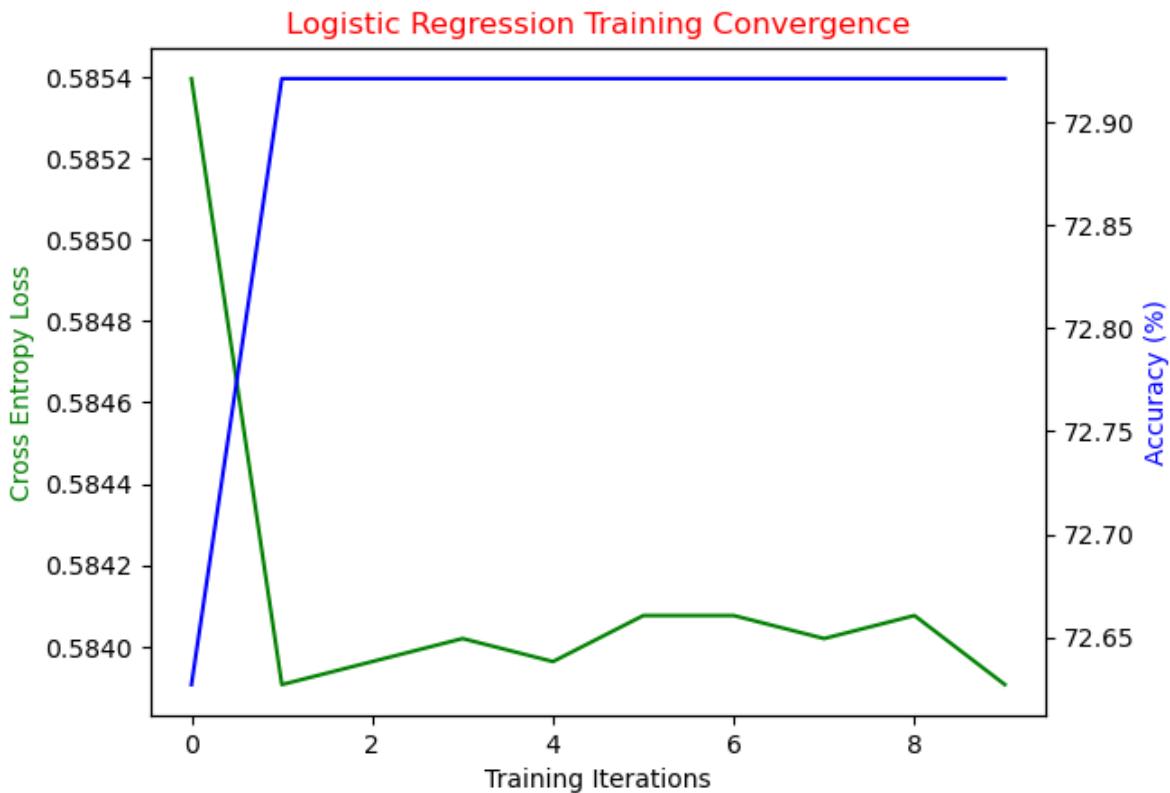
```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

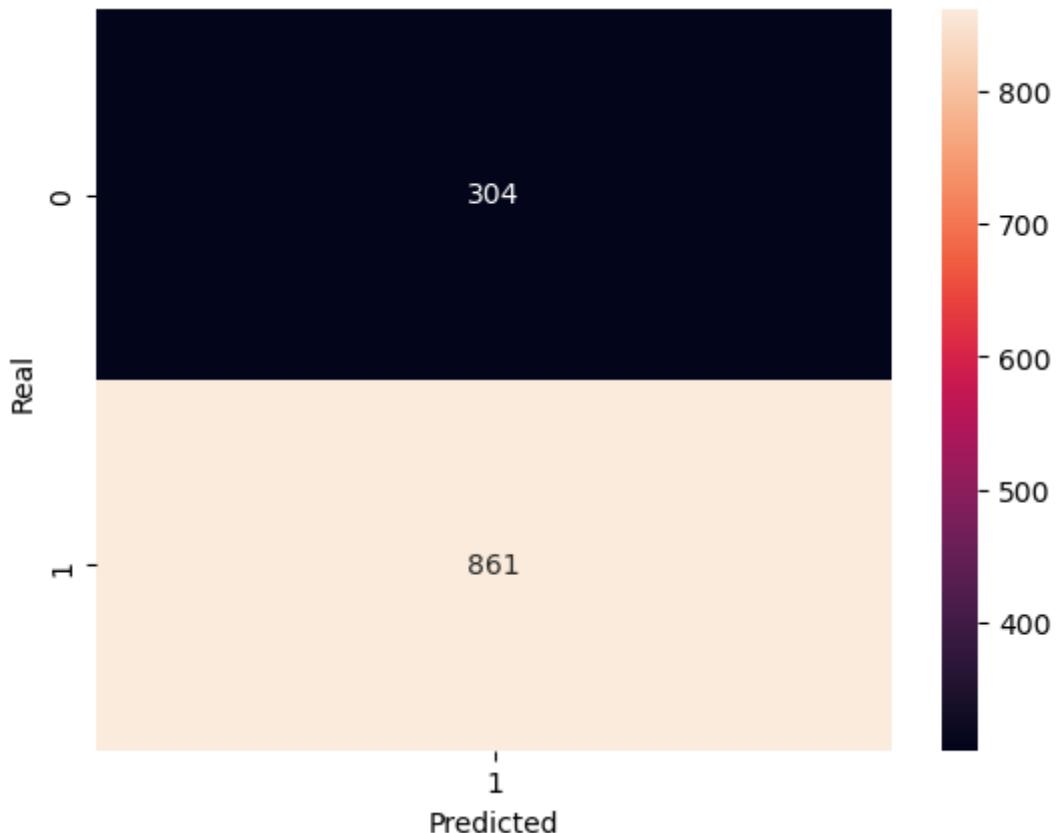
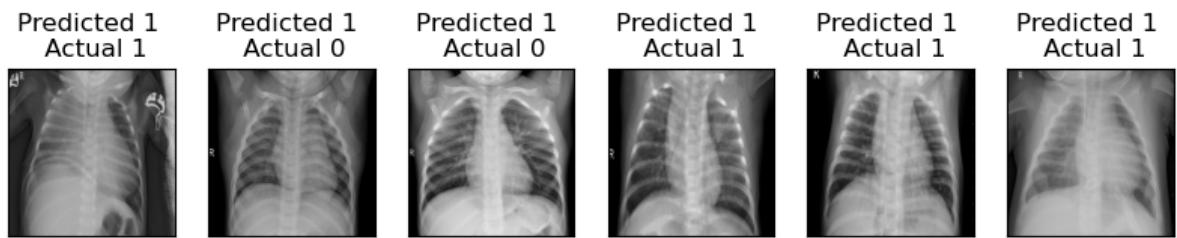
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs10_lr0.01_optimizerSGD</b>	198.856519	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 16, epochs: 10, learning rate: 0.01, optimizer: Adam  
Current: 6/90  
Training [10%] Loss: 0.5854 Accuracy: 72.63%  
Training [20%] Loss: 0.5839 Accuracy: 72.92%  
Training [30%] Loss: 0.5840 Accuracy: 72.92%  
Training [40%] Loss: 0.5840 Accuracy: 72.92%  
Training [50%] Loss: 0.5840 Accuracy: 72.92%  
Training [60%] Loss: 0.5841 Accuracy: 72.92%  
Training [70%] Loss: 0.5841 Accuracy: 72.92%  
Training [80%] Loss: 0.5840 Accuracy: 72.92%  
Training [90%] Loss: 0.5841 Accuracy: 72.92%  
Training [100%] Loss: 0.5839 Accuracy: 72.92%  
Time taken: 228.9003622531891



Performance on test data:  
Loss: 0.5759  
Accuracy: 73.91%



Time taken: 228.9003622531891

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

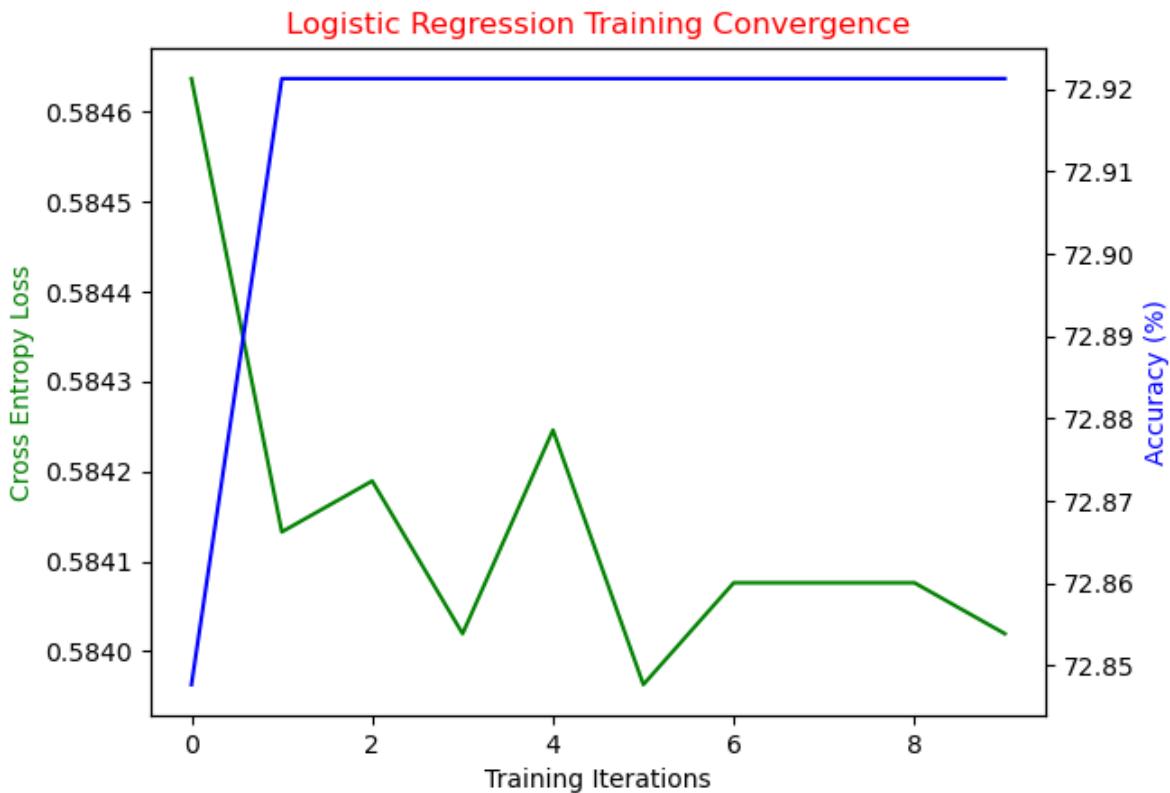
```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

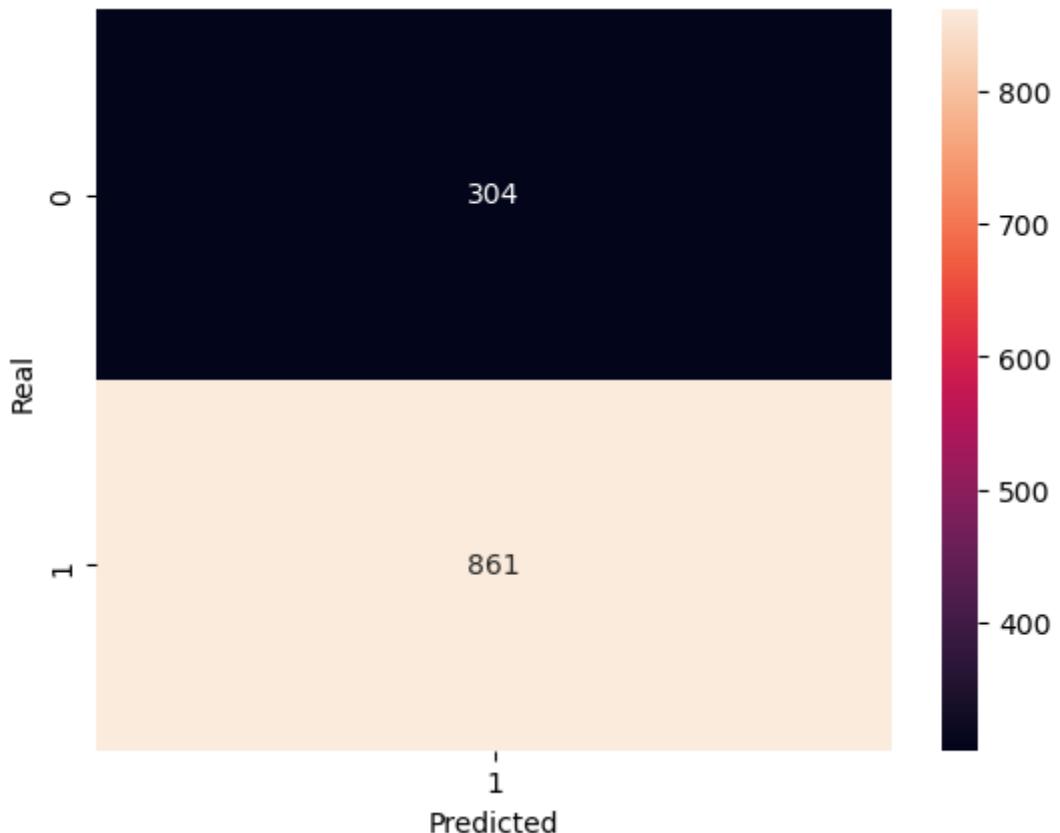
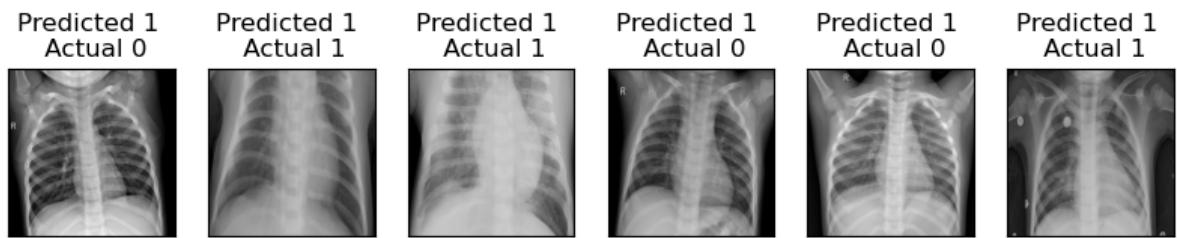
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs10_lr0.01_optimizerAdam</b>	228.900362	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 16, epochs: 10, learning rate: 0.1, optimizer: SGD  
Current: 7/90  
Training [10%] Loss: 0.5846 Accuracy: 72.85%  
Training [20%] Loss: 0.5841 Accuracy: 72.92%  
Training [30%] Loss: 0.5842 Accuracy: 72.92%  
Training [40%] Loss: 0.5840 Accuracy: 72.92%  
Training [50%] Loss: 0.5842 Accuracy: 72.92%  
Training [60%] Loss: 0.5840 Accuracy: 72.92%  
Training [70%] Loss: 0.5841 Accuracy: 72.92%  
Training [80%] Loss: 0.5841 Accuracy: 72.92%  
Training [90%] Loss: 0.5841 Accuracy: 72.92%  
Training [100%] Loss: 0.5840 Accuracy: 72.92%  
Time taken: 192.21956396102905



Performance on test data:  
Loss: 0.5760  
Accuracy: 73.91%



Time taken: 192.21956396102905  
 Test size: 1165  
 Total Accuracy: 0.7390557939914163  
 Total Precision: 0.7390557939914163  
 Total Recall: 1.0  
 Total F1 Score: 0.8499506416584404  
 Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs10_lr0.1_optimizerSGD</b>	192.219564	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

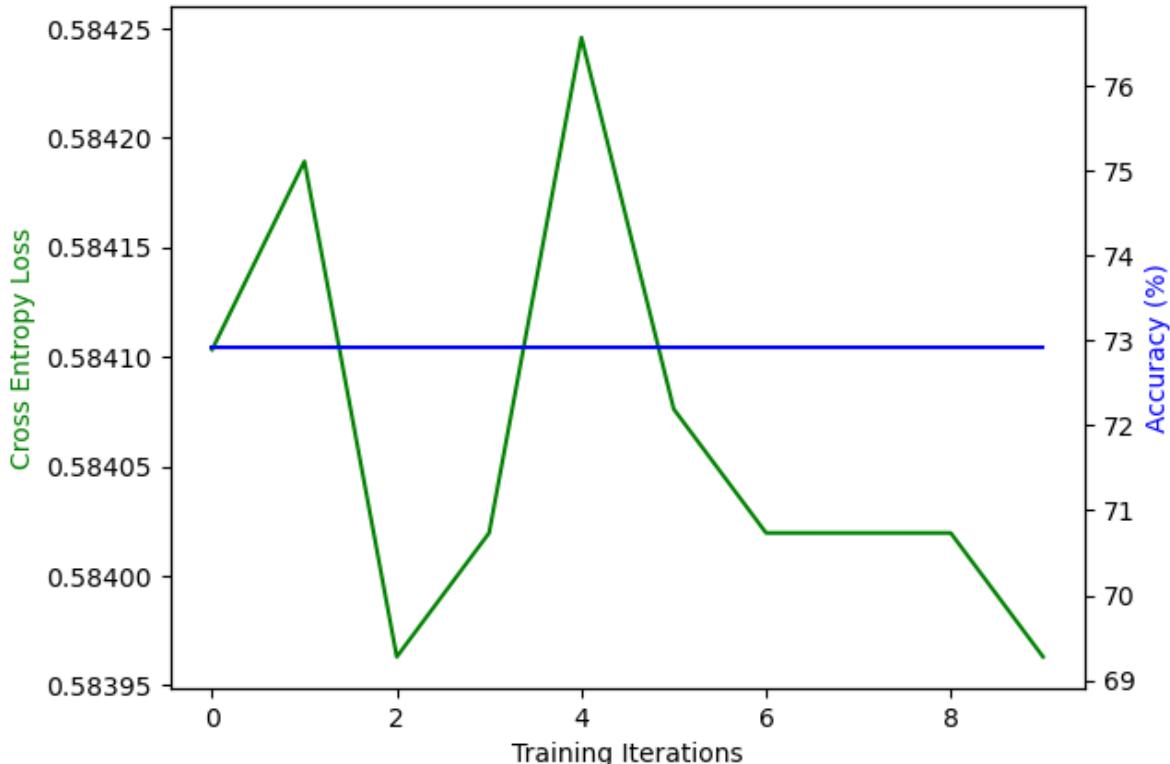
Training with batch size: 16, epochs: 10, learning rate: 0.1, optimizer: Adam

Current: 8/90

Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5841	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5840	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 229.27179980278015

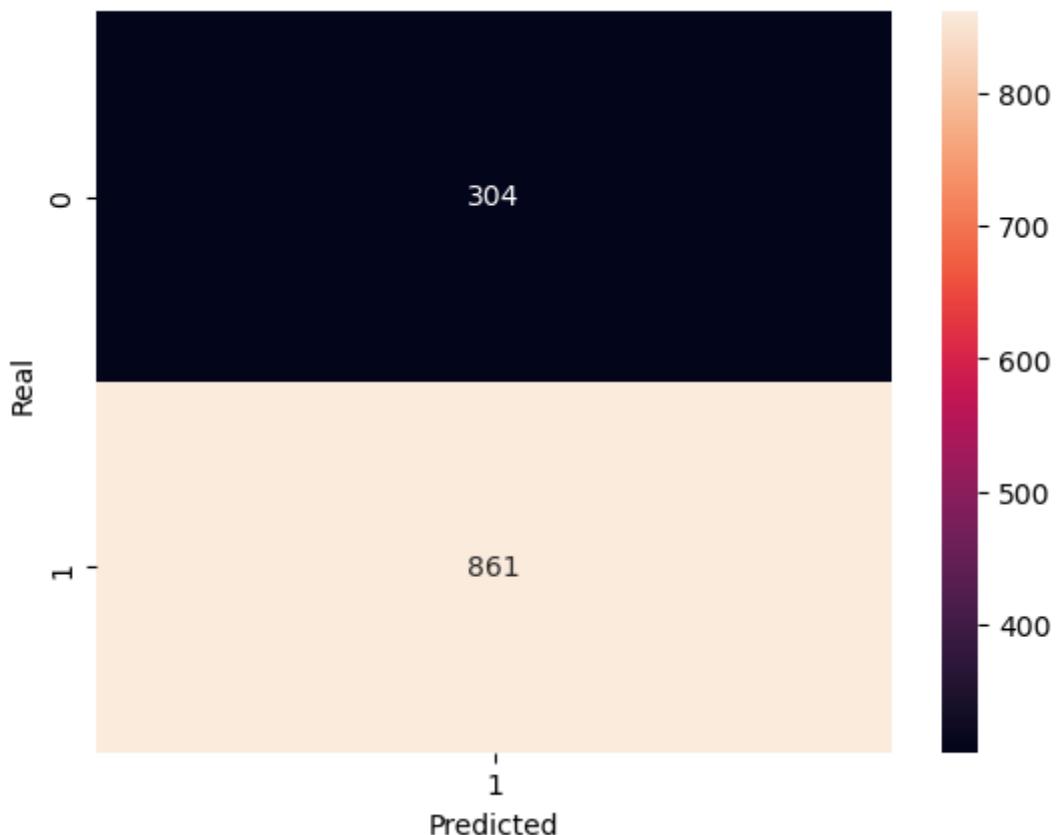
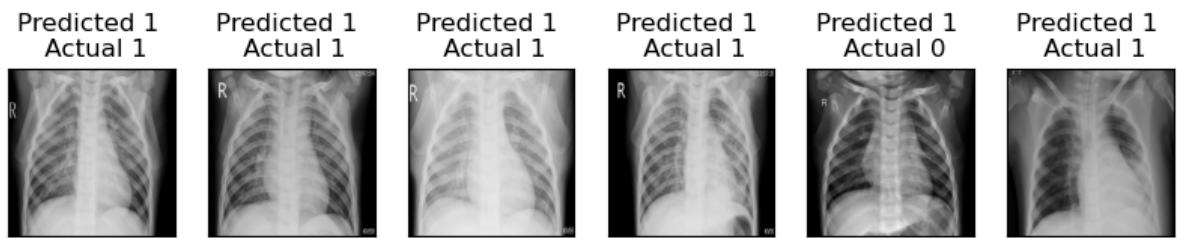
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 229.27179980278015  
 Test size: 1165  
 Total Accuracy: 0.7390557939914163  
 Total Precision: 0.7390557939914163  
 Total Recall: 1.0  
 Total F1 Score: 0.8499506416584404  
 Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch16_epochs10_lr0.1_optimizerAdam</b>	229.2718	0.739056	0.739056	1.0	0.849951

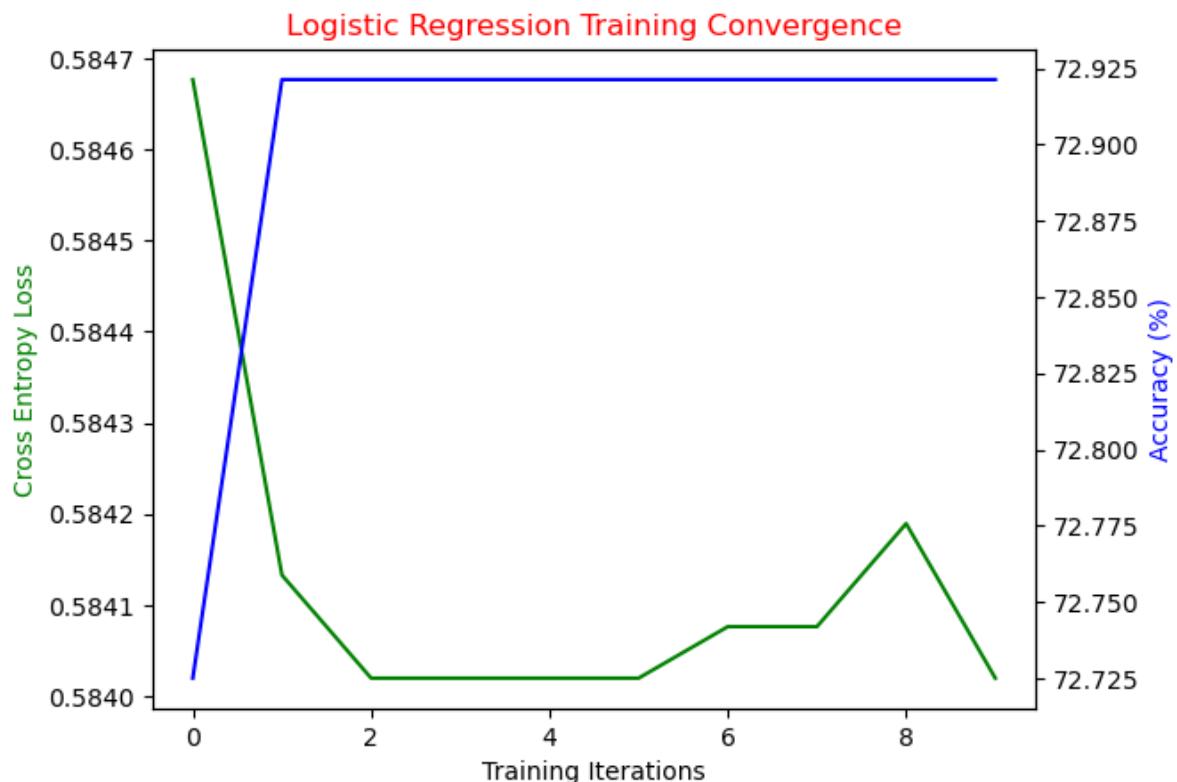
Data Stored Successfully

Training with batch size: 16, epochs: 10, learning rate: 1, optimizer: SGD

Current: 9/90

Training [10%]	Loss: 0.5847	Accuracy: 72.73%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

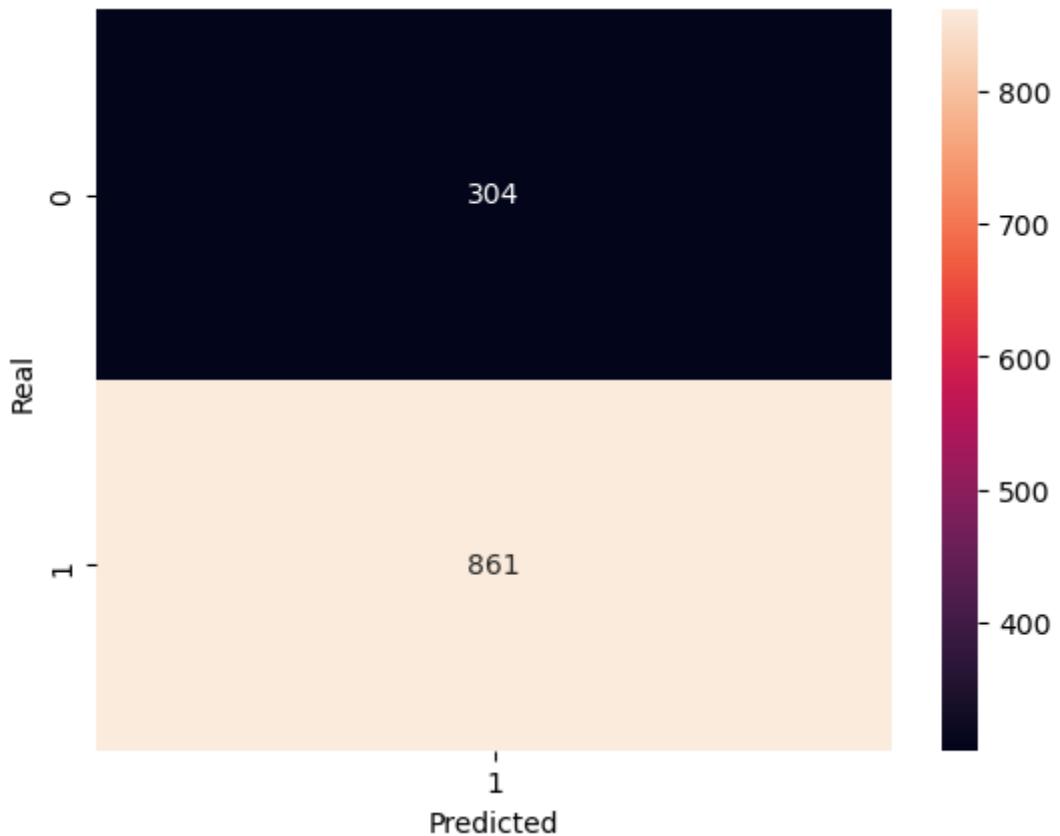
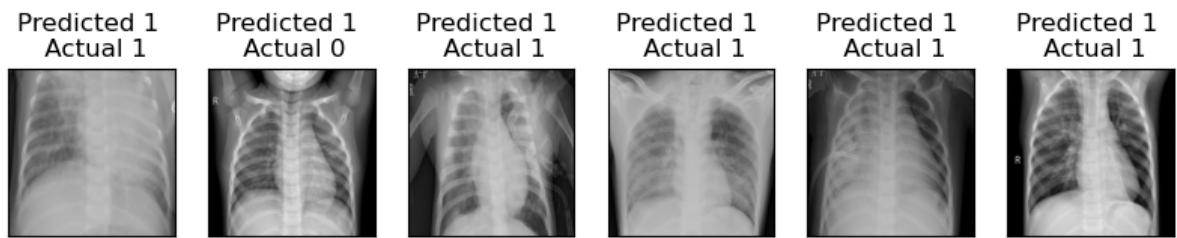
Time taken: 193.82004833221436



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 193.82004833221436  
 Test size: 1165  
 Total Accuracy: 0.7390557939914163  
 Total Precision: 0.7390557939914163  
 Total Recall: 1.0  
 Total F1 Score: 0.8499506416584404  
 Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs10_lr1_optimizerSGD</b>	193.820048	0.739056	0.739056	1.0	0.849951

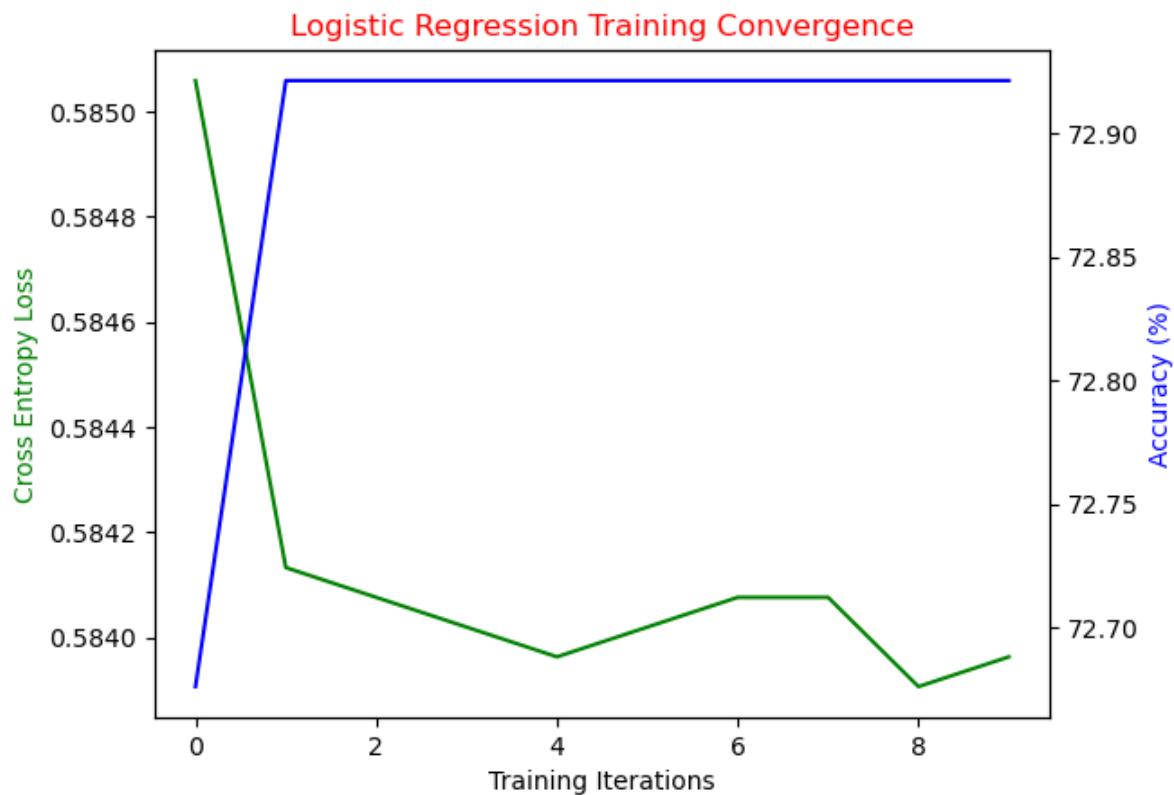
Data Stored Successfully

Training with batch size: 16, epochs: 10, learning rate: 1, optimizer: Adam

Current: 10/90

Training [10%]	Loss: 0.5851	Accuracy: 72.68%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

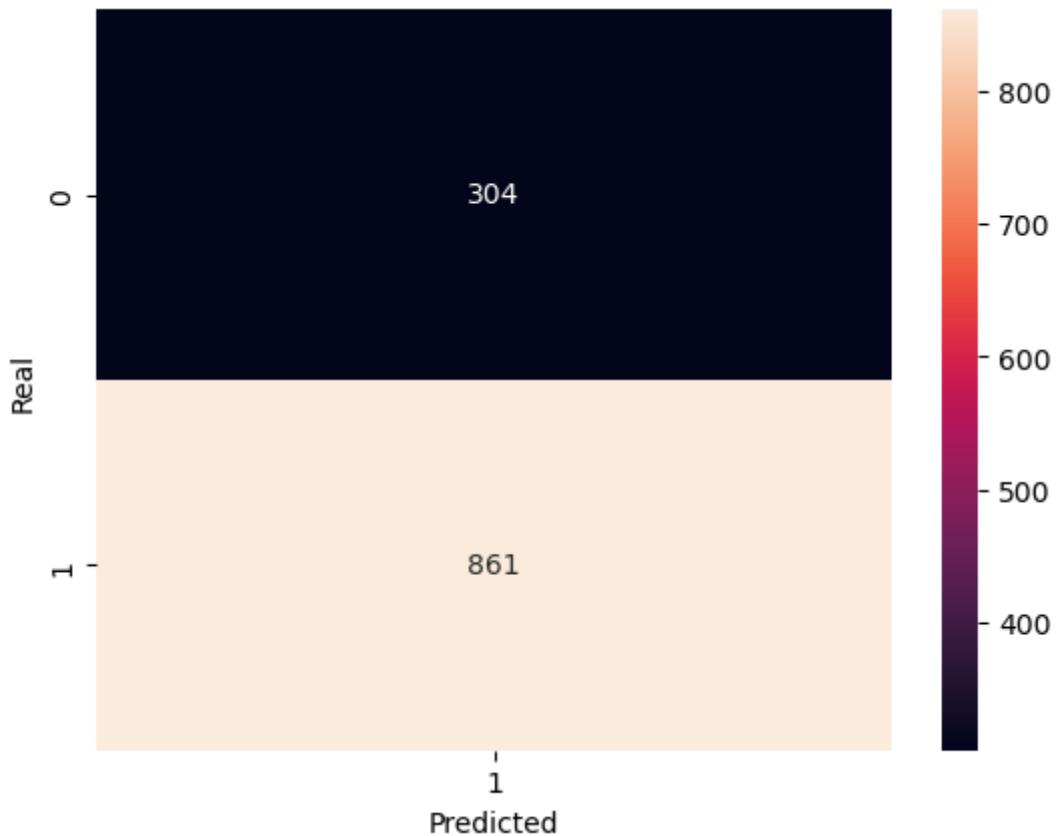
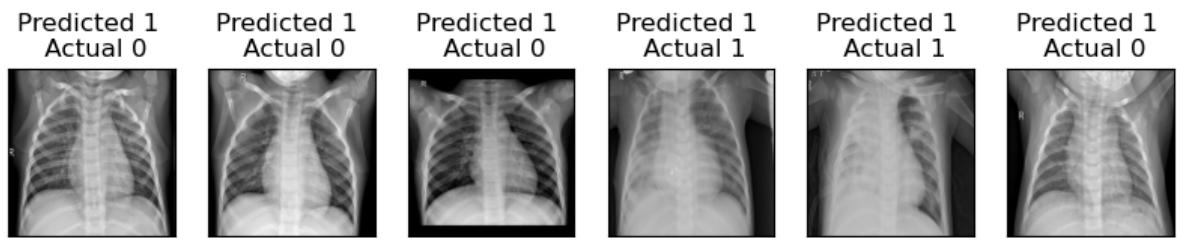
Time taken: 235.94986009597778



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 235.94986009597778  
 Test size: 1165  
 Total Accuracy: 0.7390557939914163  
 Total Precision: 0.7390557939914163  
 Total Recall: 1.0  
 Total F1 Score: 0.8499506416584404  
 Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs10_lr1_optimizerAdam</b>	235.94986	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

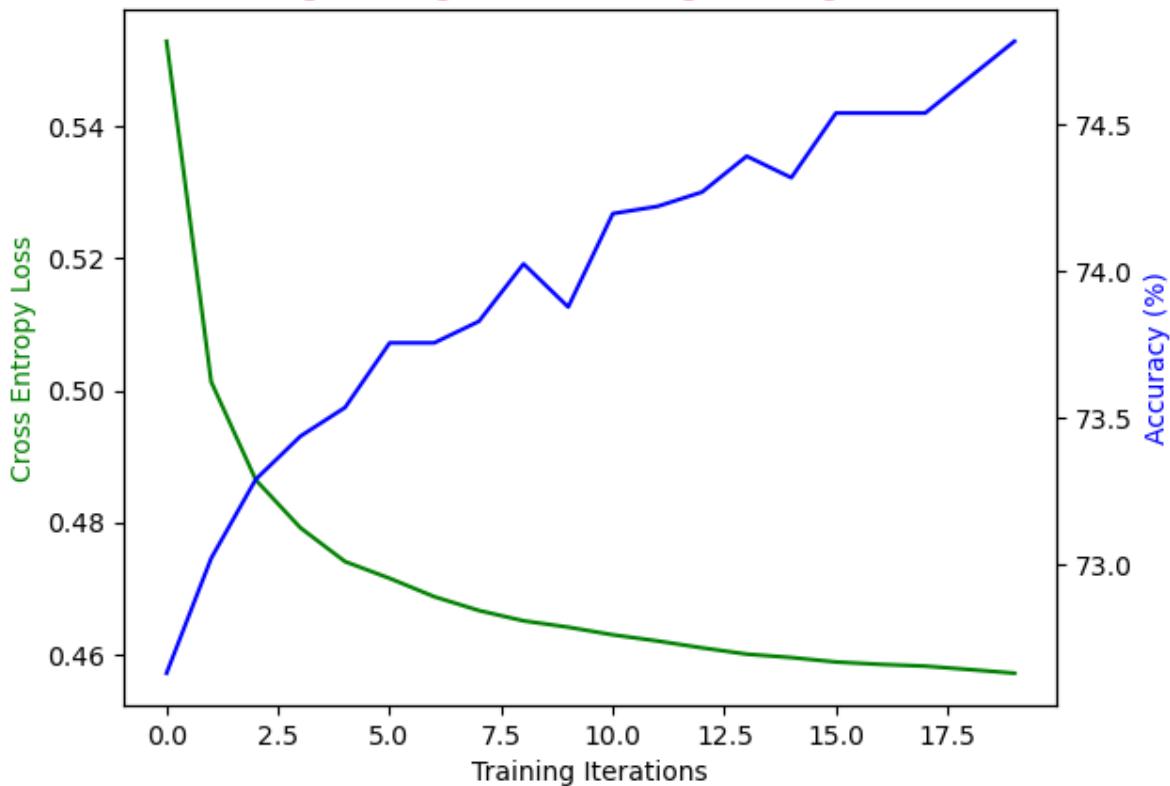
Training with batch size: 16, epochs: 20, learning rate: 0.0001, optimizer: SGD

Current: 11/90

Training [5%]	Loss: 0.5529	Accuracy: 72.63%
Training [10%]	Loss: 0.5013	Accuracy: 73.02%
Training [15%]	Loss: 0.4864	Accuracy: 73.29%
Training [20%]	Loss: 0.4792	Accuracy: 73.44%
Training [25%]	Loss: 0.4740	Accuracy: 73.53%
Training [30%]	Loss: 0.4715	Accuracy: 73.76%
Training [35%]	Loss: 0.4687	Accuracy: 73.76%
Training [40%]	Loss: 0.4666	Accuracy: 73.83%
Training [45%]	Loss: 0.4651	Accuracy: 74.03%
Training [50%]	Loss: 0.4641	Accuracy: 73.88%
Training [55%]	Loss: 0.4629	Accuracy: 74.20%
Training [60%]	Loss: 0.4620	Accuracy: 74.22%
Training [65%]	Loss: 0.4610	Accuracy: 74.27%
Training [70%]	Loss: 0.4600	Accuracy: 74.39%
Training [75%]	Loss: 0.4595	Accuracy: 74.32%
Training [80%]	Loss: 0.4588	Accuracy: 74.54%
Training [85%]	Loss: 0.4585	Accuracy: 74.54%
Training [90%]	Loss: 0.4582	Accuracy: 74.54%
Training [95%]	Loss: 0.4577	Accuracy: 74.66%
Training [100%]	Loss: 0.4571	Accuracy: 74.79%

Time taken: 389.0391774177551

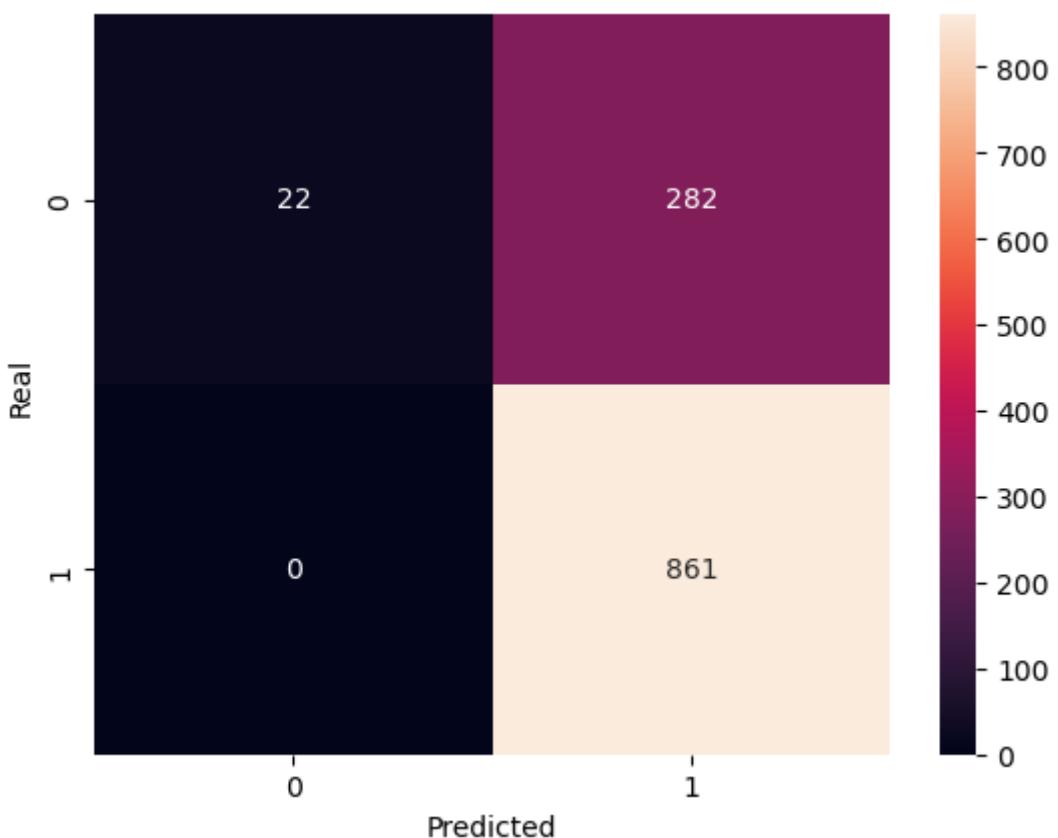
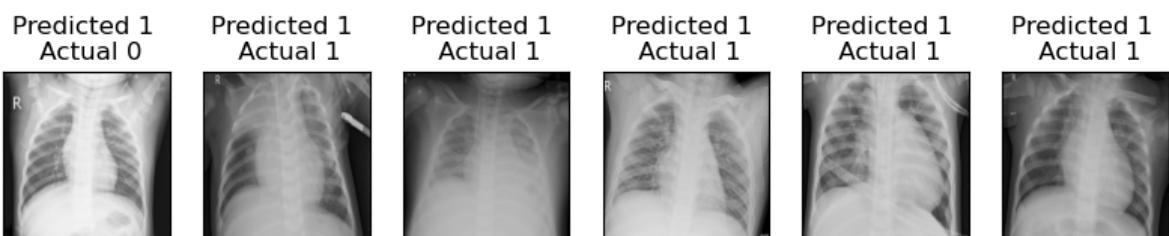
## Logistic Regression Training Convergence



Performance on test data:

Loss: 0.4499

Accuracy: 75.79%



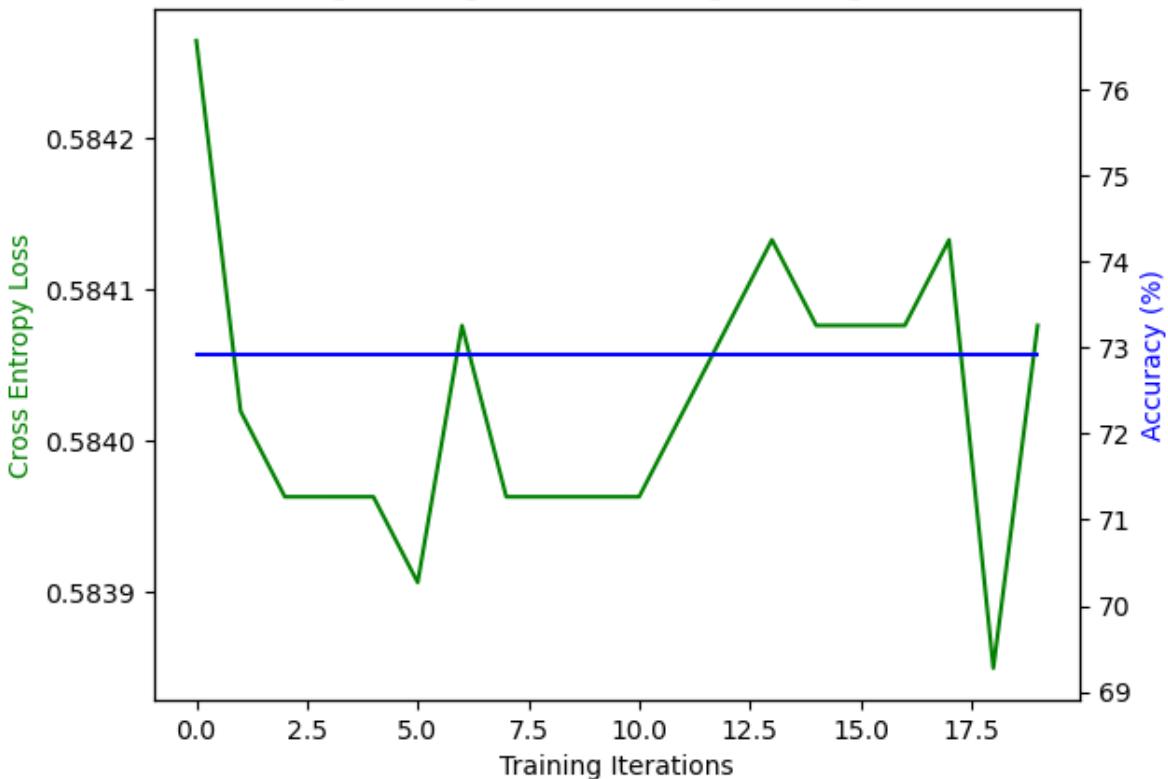
Time taken: 389.0391774177551  
 Test size: 1165  
 Total Accuracy: 0.7579399141630901  
 Total Precision: 0.7532808398950132  
 Total Recall: 1.0  
 Total F1 Score: 0.8592814371257484  
 Classification Report:

	precision	recall	f1-score	support
0	1.00	0.07	0.13	304
1	0.75	1.00	0.86	861
accuracy			0.76	1165
macro avg	0.88	0.54	0.50	1165
weighted avg	0.82	0.76	0.67	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.0001_optimizerSGD</b>	389.039177	0.75794	0.753281	1.0	0.859281

Data Stored Successfully  
 Training with batch size: 16, epochs: 20, learning rate: 0.0001, optimizer: Adam  
 Current: 12/90  
 Training [5%] Loss: 0.5843 Accuracy: 72.92%  
 Training [10%] Loss: 0.5840 Accuracy: 72.92%  
 Training [15%] Loss: 0.5840 Accuracy: 72.92%  
 Training [20%] Loss: 0.5840 Accuracy: 72.92%  
 Training [25%] Loss: 0.5840 Accuracy: 72.92%  
 Training [30%] Loss: 0.5839 Accuracy: 72.92%  
 Training [35%] Loss: 0.5841 Accuracy: 72.92%  
 Training [40%] Loss: 0.5840 Accuracy: 72.92%  
 Training [45%] Loss: 0.5840 Accuracy: 72.92%  
 Training [50%] Loss: 0.5840 Accuracy: 72.92%  
 Training [55%] Loss: 0.5840 Accuracy: 72.92%  
 Training [60%] Loss: 0.5840 Accuracy: 72.92%  
 Training [65%] Loss: 0.5841 Accuracy: 72.92%  
 Training [70%] Loss: 0.5841 Accuracy: 72.92%  
 Training [75%] Loss: 0.5841 Accuracy: 72.92%  
 Training [80%] Loss: 0.5841 Accuracy: 72.92%  
 Training [85%] Loss: 0.5841 Accuracy: 72.92%  
 Training [90%] Loss: 0.5841 Accuracy: 72.92%  
 Training [95%] Loss: 0.5838 Accuracy: 72.92%  
 Training [100%] Loss: 0.5841 Accuracy: 72.92%  
 Time taken: 470.34647822380066

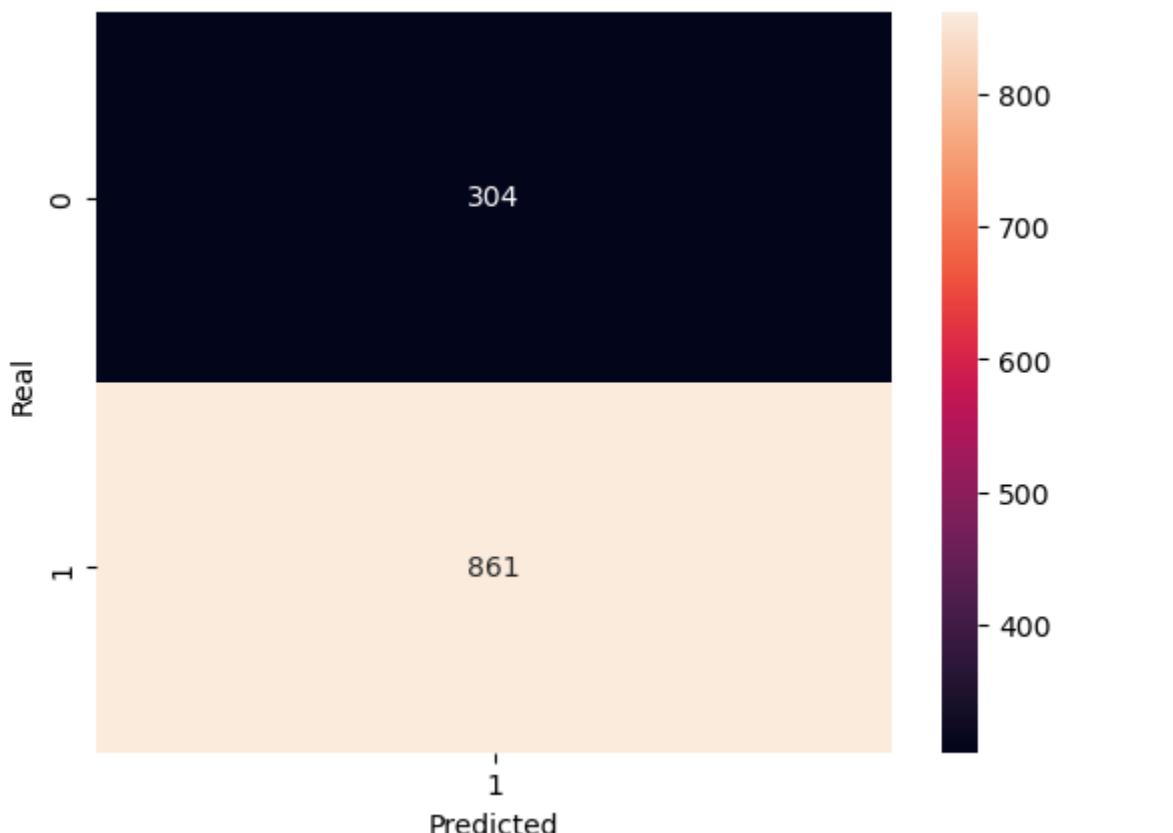
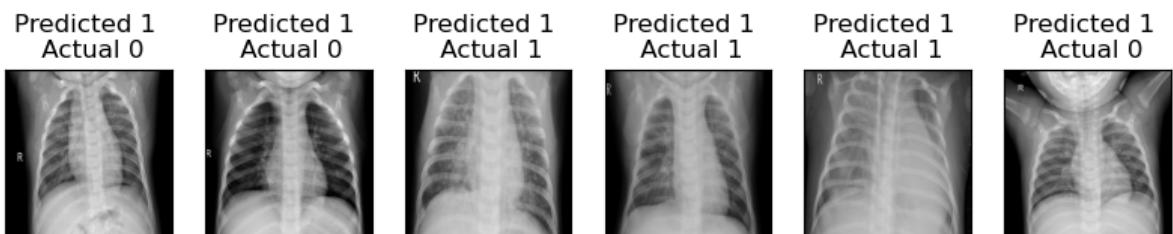
## Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 470.34647822380066
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
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    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.0001_optimizerAdam</b>	470.346478	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 16, epochs: 20, learning rate: 0.001, optimizer: SGD

Current: 13/90

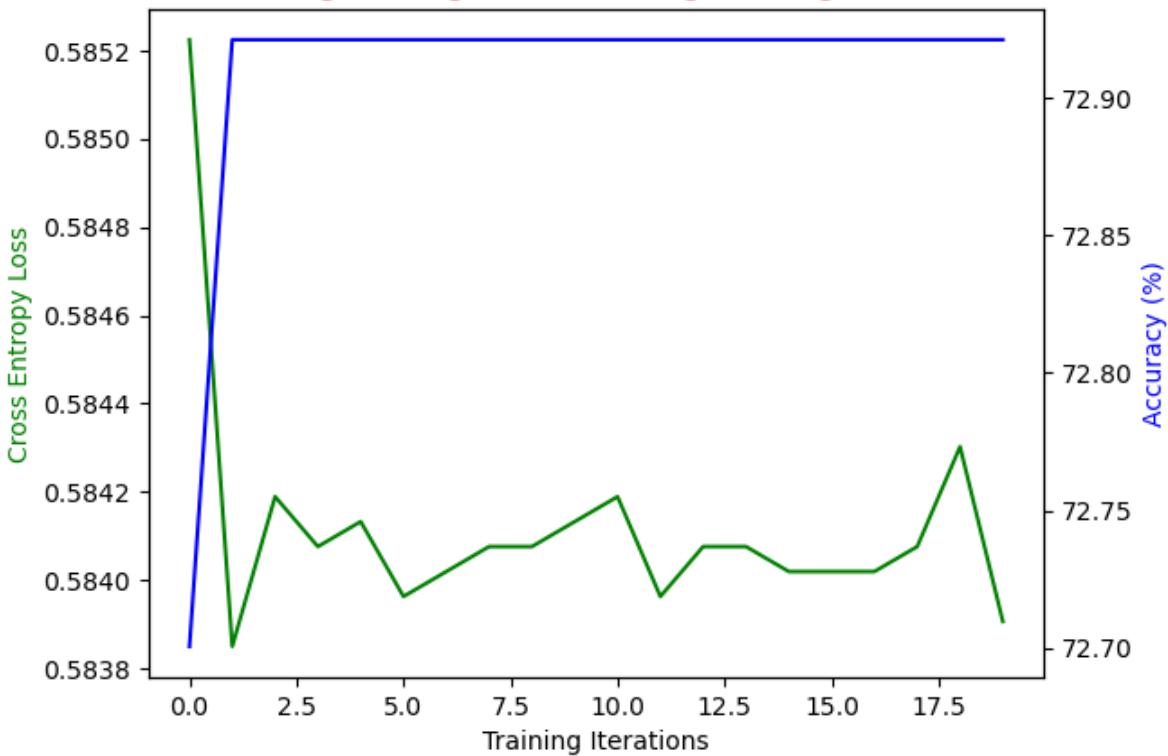
```

Training [5%] Loss: 0.5852 Accuracy: 72.70%
Training [10%] Loss: 0.5838 Accuracy: 72.92%
Training [15%] Loss: 0.5842 Accuracy: 72.92%
Training [20%] Loss: 0.5841 Accuracy: 72.92%
Training [25%] Loss: 0.5841 Accuracy: 72.92%
Training [30%] Loss: 0.5840 Accuracy: 72.92%
Training [35%] Loss: 0.5840 Accuracy: 72.92%
Training [40%] Loss: 0.5841 Accuracy: 72.92%
Training [45%] Loss: 0.5841 Accuracy: 72.92%
Training [50%] Loss: 0.5841 Accuracy: 72.92%
Training [55%] Loss: 0.5842 Accuracy: 72.92%
Training [60%] Loss: 0.5840 Accuracy: 72.92%
Training [65%] Loss: 0.5841 Accuracy: 72.92%
Training [70%] Loss: 0.5841 Accuracy: 72.92%
Training [75%] Loss: 0.5840 Accuracy: 72.92%
Training [80%] Loss: 0.5840 Accuracy: 72.92%
Training [85%] Loss: 0.5840 Accuracy: 72.92%
Training [90%] Loss: 0.5841 Accuracy: 72.92%
Training [95%] Loss: 0.5843 Accuracy: 72.92%
Training [100%] Loss: 0.5839 Accuracy: 72.92%

```

Time taken: 387.1545670032501

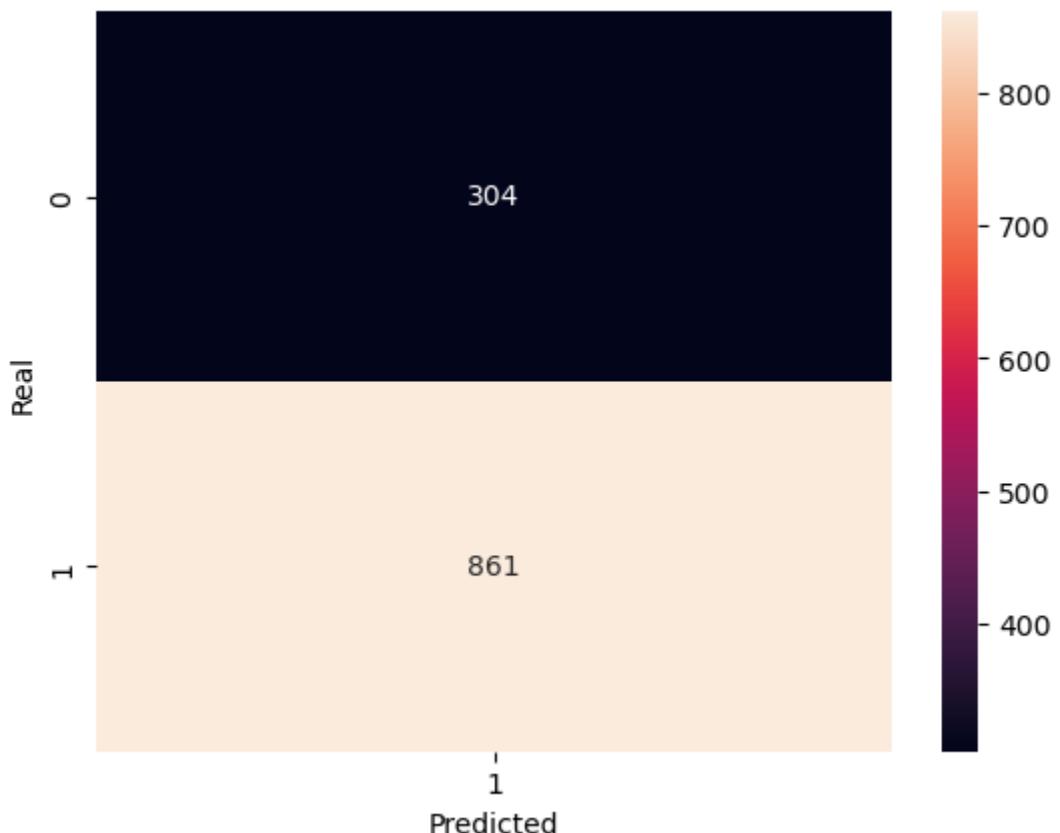
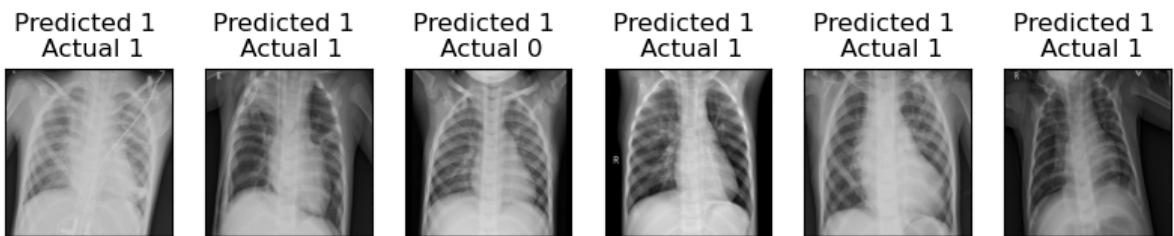
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5759

Accuracy: 73.91%



```

Time taken: 387.1545670032501
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.001_optimizerSGD</b>	387.154567	0.739056	0.739056	1.0	0.849951

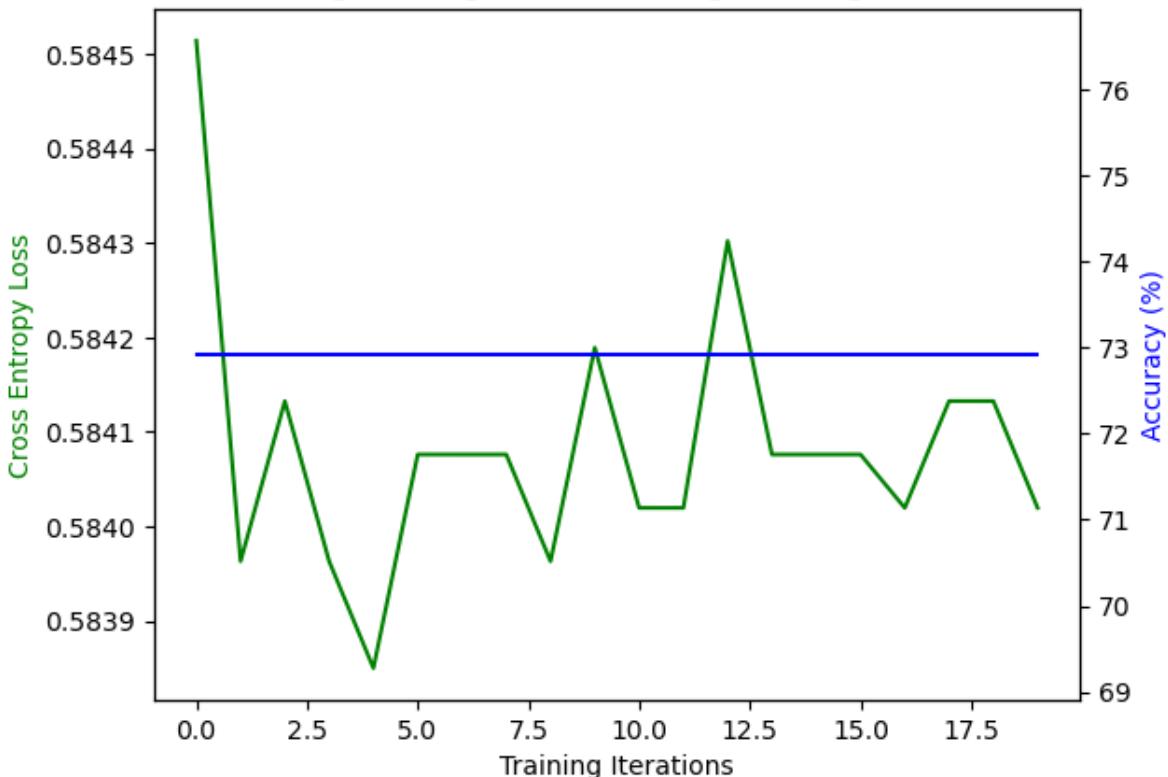
Data Stored Successfully

Training with batch size: 16, epochs: 20, learning rate: 0.001, optimizer: Adam  
Current: 14/90

Training [5%]	Loss: 0.5845	Accuracy: 72.92%
Training [10%]	Loss: 0.5840	Accuracy: 72.92%
Training [15%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [25%]	Loss: 0.5838	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [35%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [45%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [55%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [65%]	Loss: 0.5843	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [75%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5841	Accuracy: 72.92%
Training [85%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [95%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 469.4729800224304

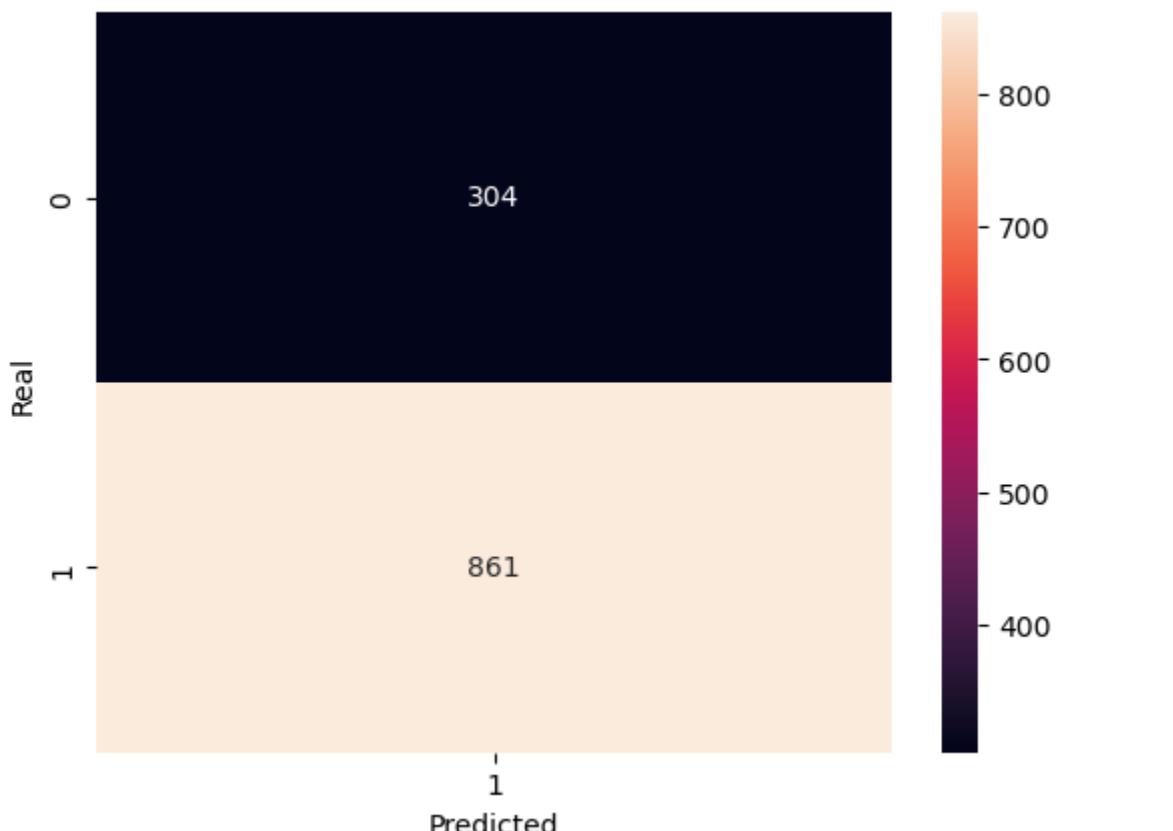
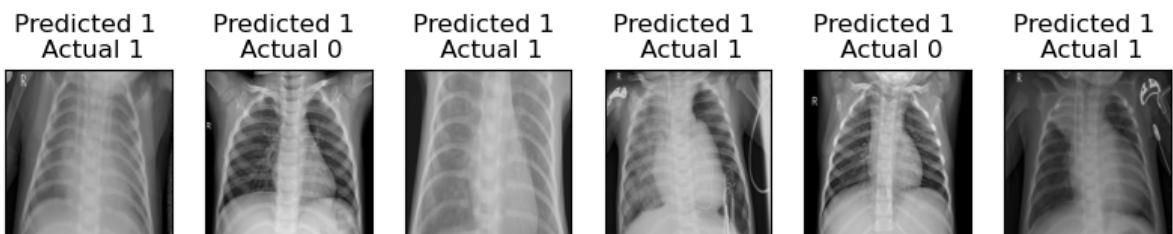
## Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 469.4729800224304
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.001_optimizerAdam</b>	469.47298	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

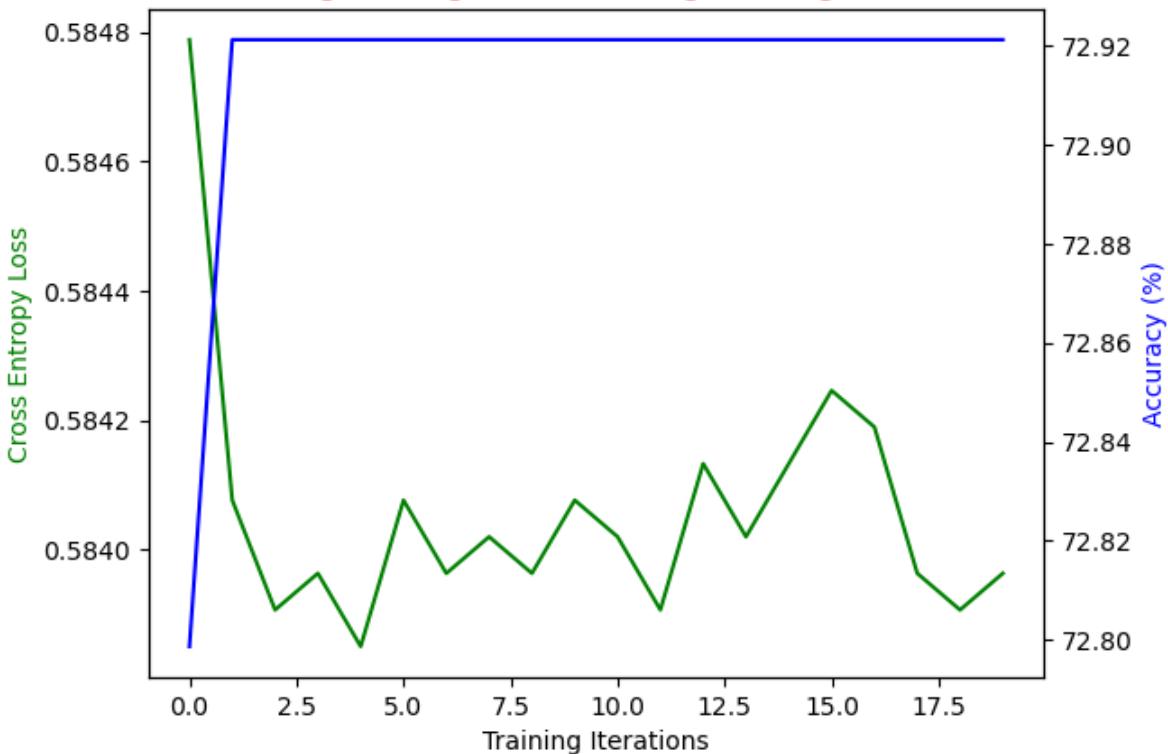
Training with batch size: 16, epochs: 20, learning rate: 0.01, optimizer: SGD

Current: 15/90

Training [5%]	Loss: 0.5848	Accuracy: 72.80%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [25%]	Loss: 0.5838	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [35%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [45%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [55%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [65%]	Loss: 0.5841	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [75%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [85%]	Loss: 0.5842	Accuracy: 72.92%
Training [90%]	Loss: 0.5840	Accuracy: 72.92%
Training [95%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 385.9541566371918

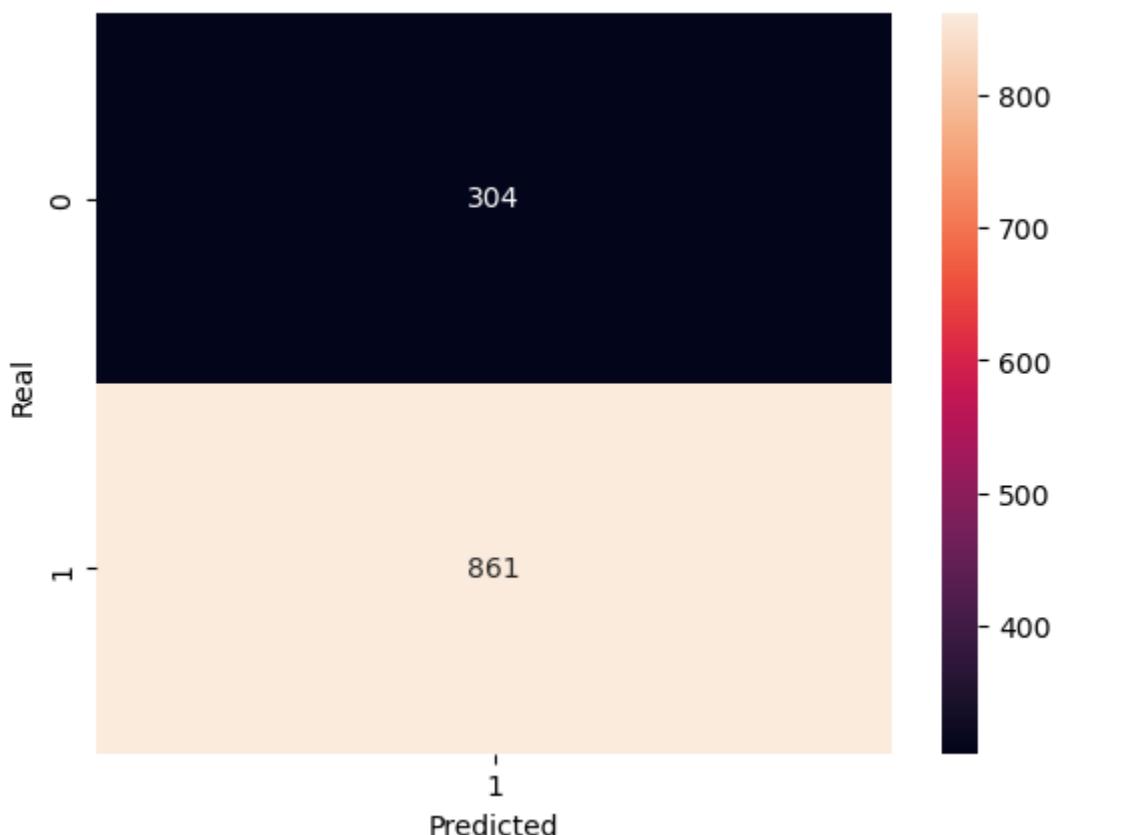
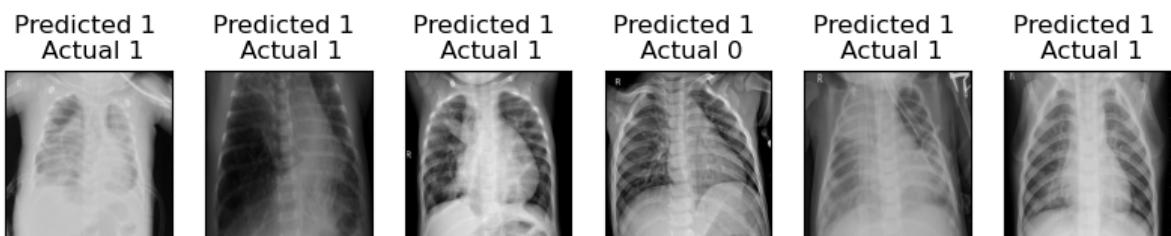
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 385.9541566371918
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

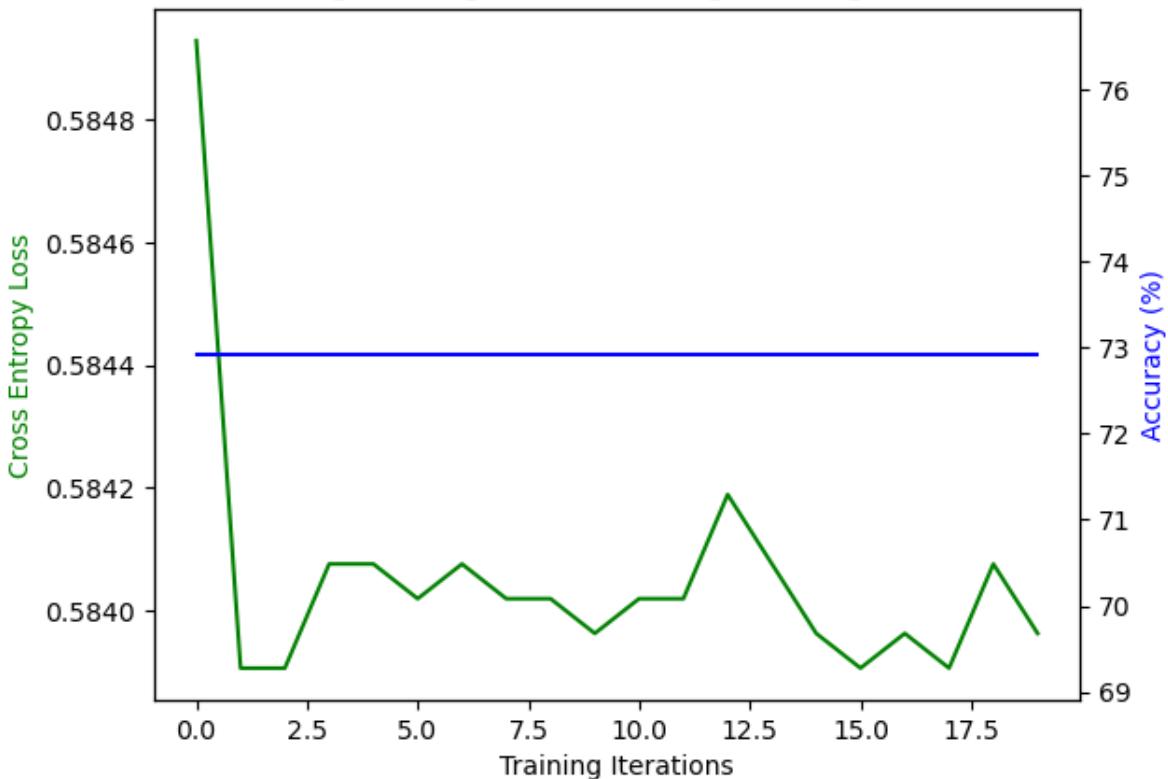
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.01_optimizerSGD</b>	385.954157	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 16, epochs: 20, learning rate: 0.01, optimizer: Adam  
Current: 16/90

Training [5%]	Loss: 0.5849	Accuracy: 72.92%
Training [10%]	Loss: 0.5839	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [25%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [35%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [45%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [55%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [65%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [75%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [85%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [95%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 474.3691177368164

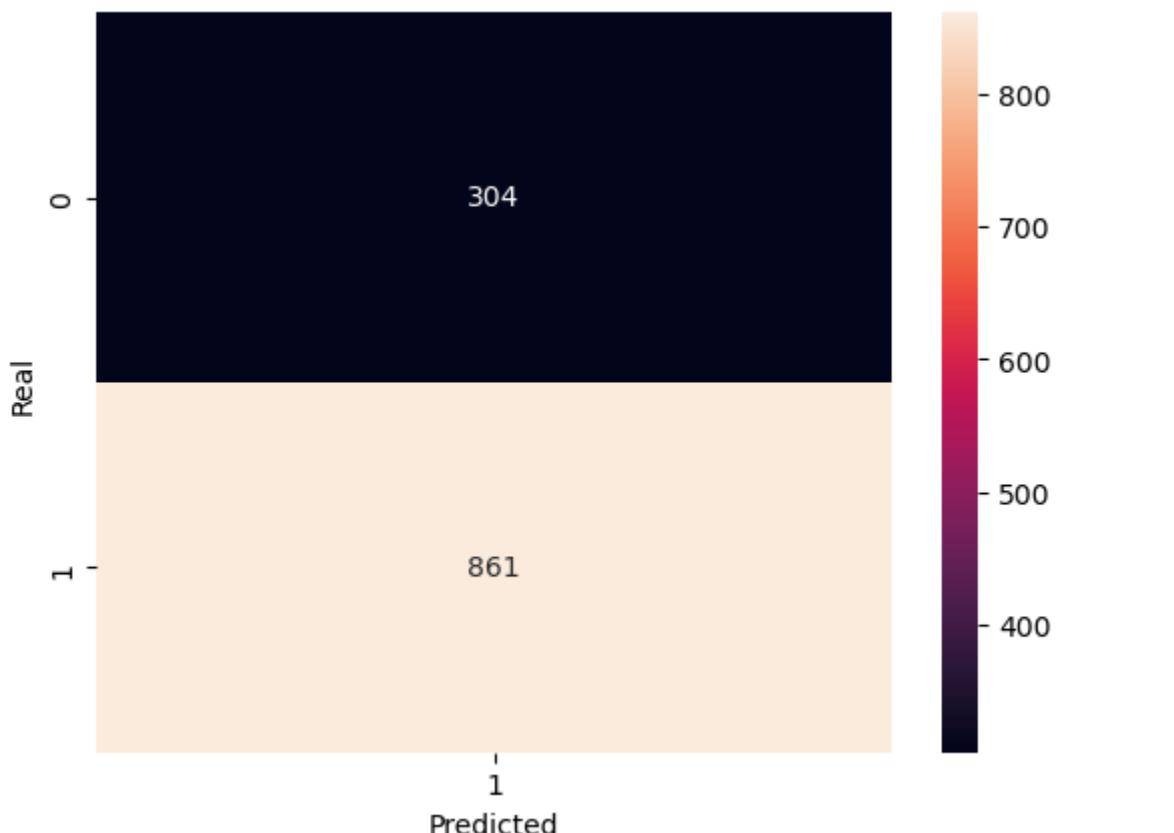
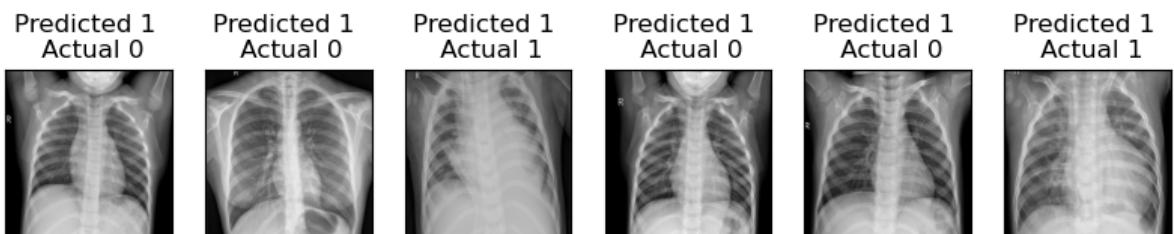
## Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 474.3691177368164
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.01_optimizerAdam</b>	474.369118	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 16, epochs: 20, learning rate: 0.1, optimizer: SGD

Current: 17/90

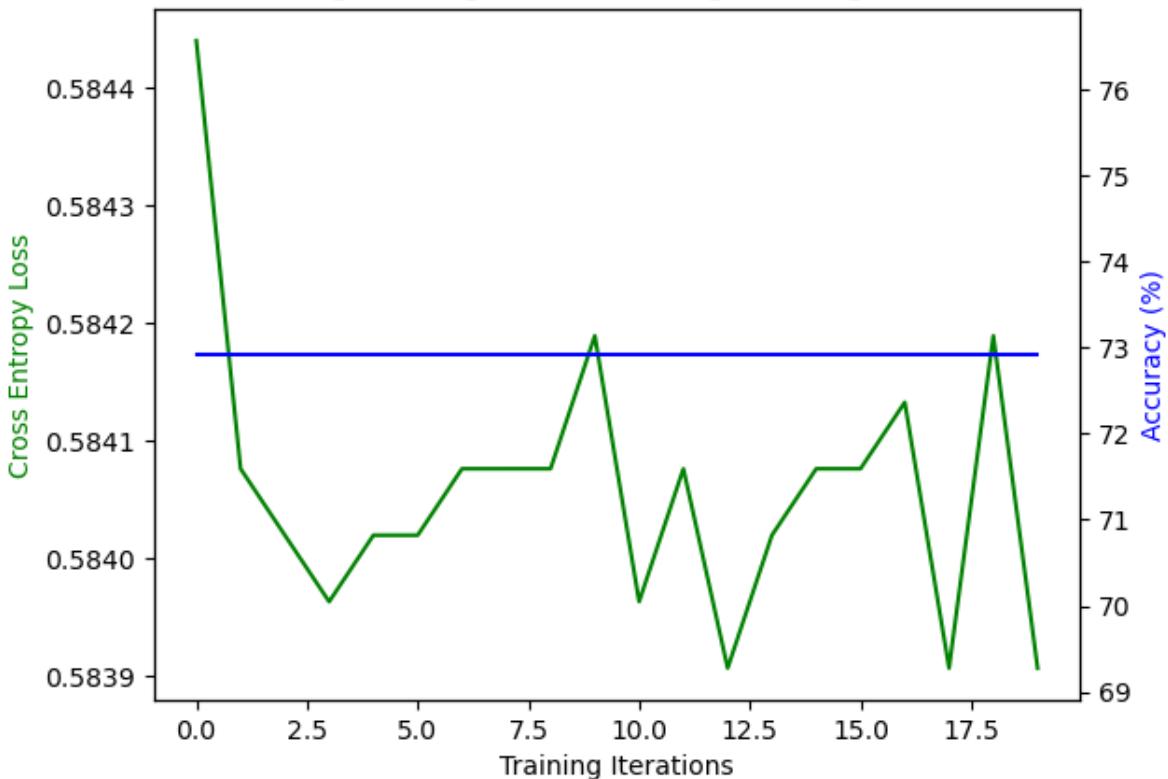
```

Training [5%] Loss: 0.5844 Accuracy: 72.92%
Training [10%] Loss: 0.5841 Accuracy: 72.92%
Training [15%] Loss: 0.5840 Accuracy: 72.92%
Training [20%] Loss: 0.5840 Accuracy: 72.92%
Training [25%] Loss: 0.5840 Accuracy: 72.92%
Training [30%] Loss: 0.5840 Accuracy: 72.92%
Training [35%] Loss: 0.5841 Accuracy: 72.92%
Training [40%] Loss: 0.5841 Accuracy: 72.92%
Training [45%] Loss: 0.5841 Accuracy: 72.92%
Training [50%] Loss: 0.5842 Accuracy: 72.92%
Training [55%] Loss: 0.5840 Accuracy: 72.92%
Training [60%] Loss: 0.5841 Accuracy: 72.92%
Training [65%] Loss: 0.5839 Accuracy: 72.92%
Training [70%] Loss: 0.5840 Accuracy: 72.92%
Training [75%] Loss: 0.5841 Accuracy: 72.92%
Training [80%] Loss: 0.5841 Accuracy: 72.92%
Training [85%] Loss: 0.5841 Accuracy: 72.92%
Training [90%] Loss: 0.5839 Accuracy: 72.92%
Training [95%] Loss: 0.5842 Accuracy: 72.92%
Training [100%] Loss: 0.5839 Accuracy: 72.92%

```

Time taken: 393.33760929107666

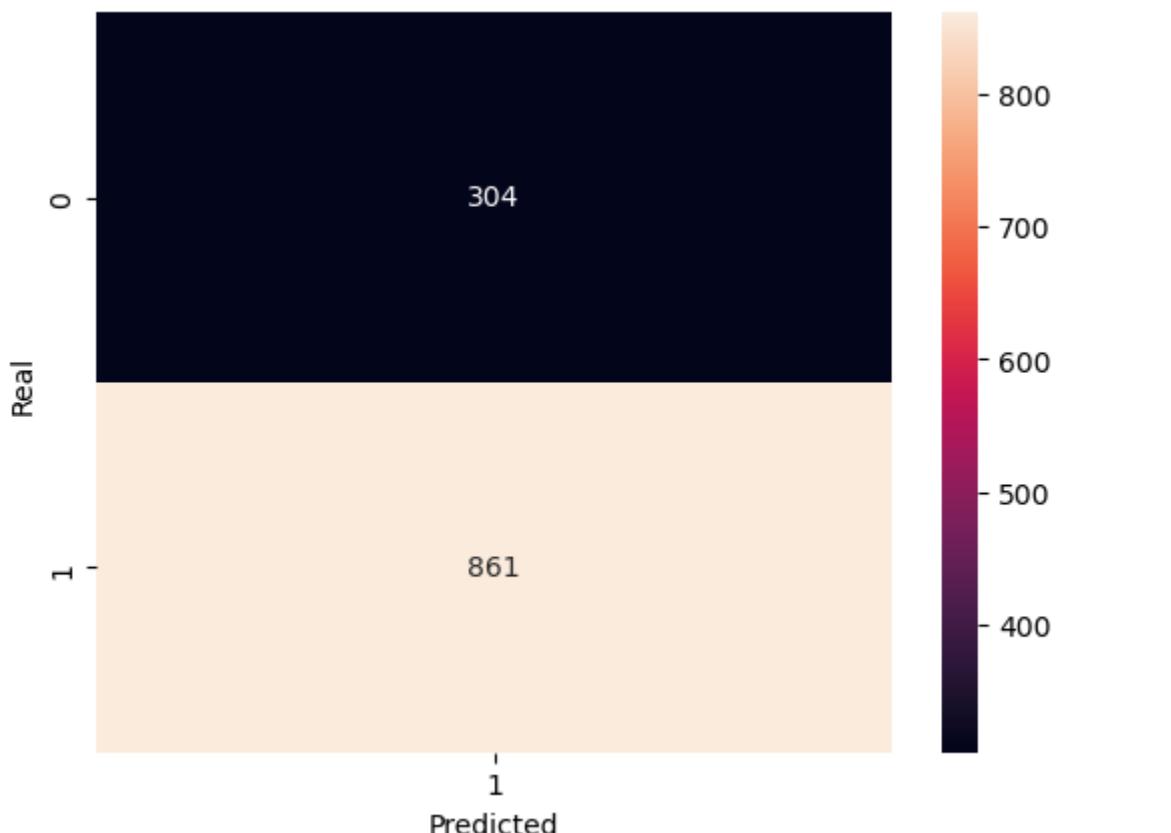
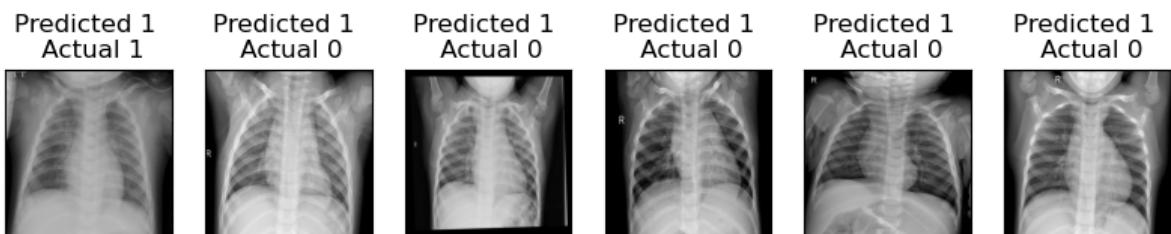
## Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5759

Accuracy: 73.91%



```

Time taken: 393.33760929107666
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.1_optimizerSGD</b>	393.337609	0.739056	0.739056	1.0	0.849951

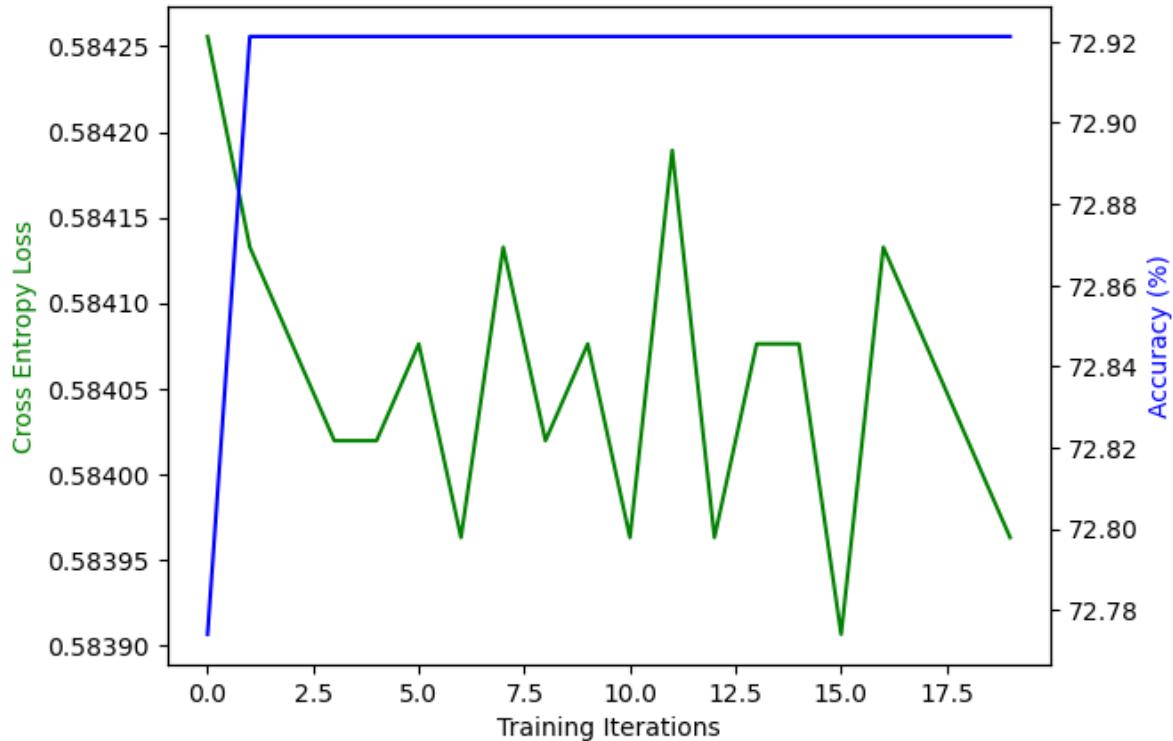
Data Stored Successfully

Training with batch size: 16, epochs: 20, learning rate: 0.1, optimizer: Adam  
Current: 18/90

Training [5%]	Loss: 0.5843	Accuracy: 72.77%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [15%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [25%]	Loss: 0.5840	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [35%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [45%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [55%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [65%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [75%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [85%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [95%]	Loss: 0.5840	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 471.4960799217224

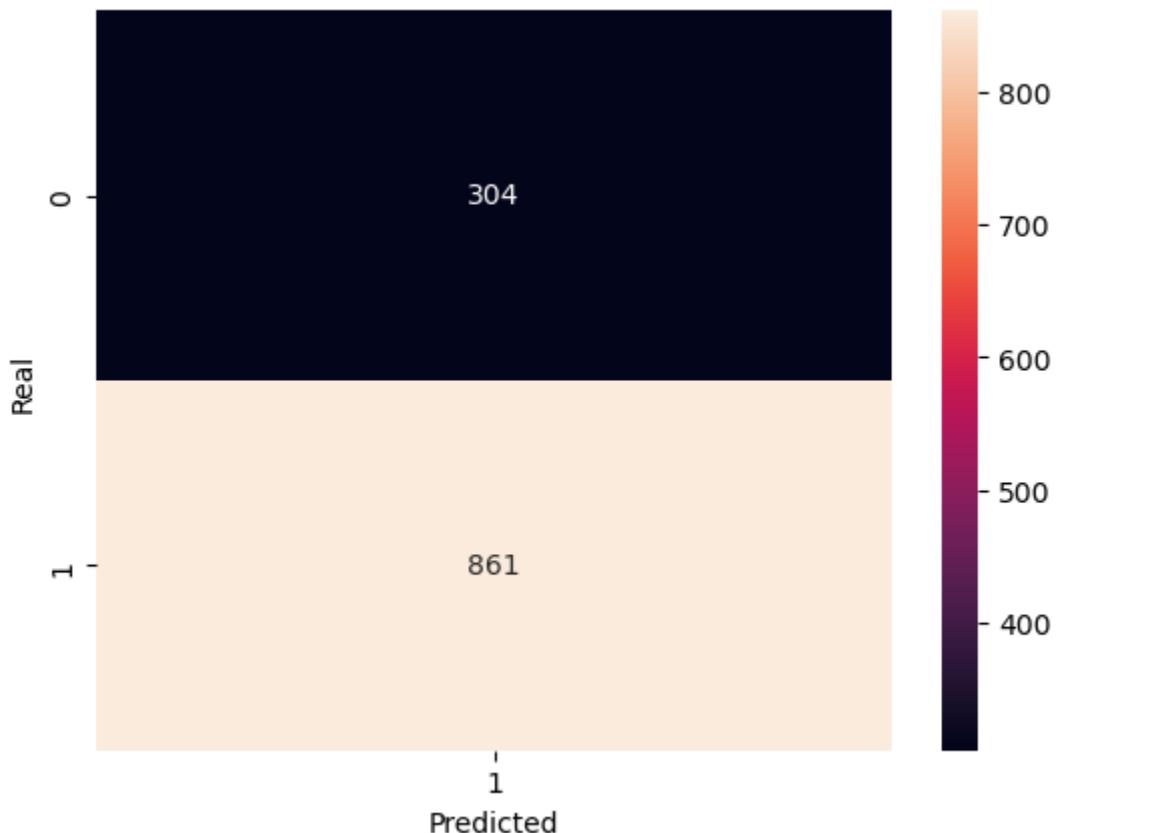
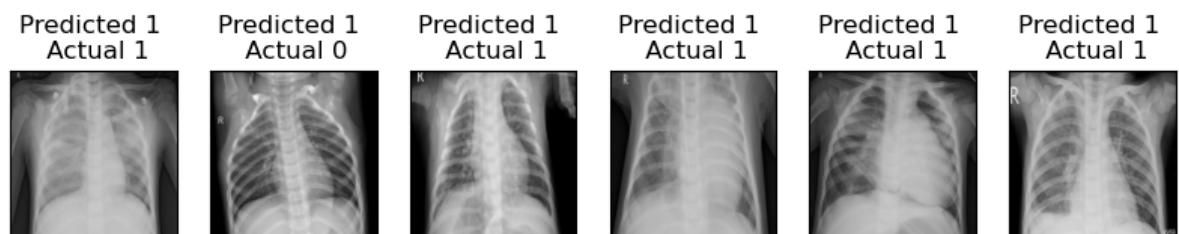
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 471.4960799217224
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr0.1_optimizerAdam</b>	471.49608	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 16, epochs: 20, learning rate: 1, optimizer: SGD

Current: 19/90

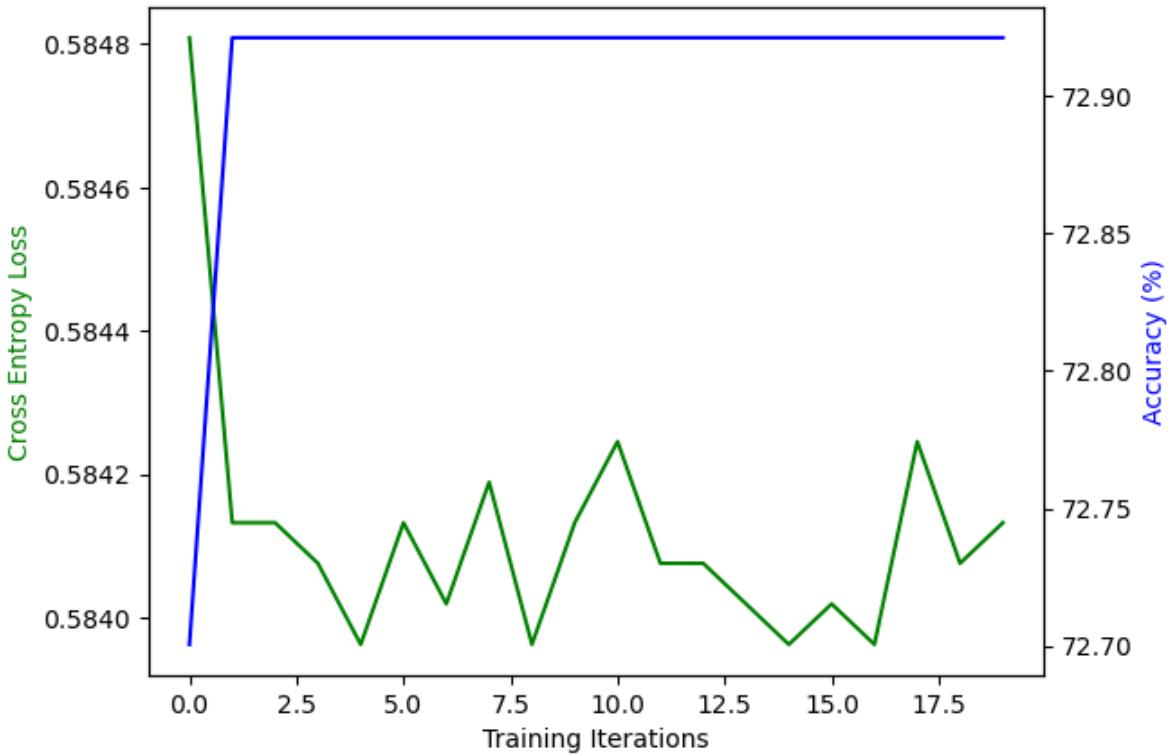
```

Training [5%]  Loss: 0.5848    Accuracy: 72.70%
Training [10%] Loss: 0.5841    Accuracy: 72.92%
Training [15%] Loss: 0.5841    Accuracy: 72.92%
Training [20%] Loss: 0.5841    Accuracy: 72.92%
Training [25%] Loss: 0.5840    Accuracy: 72.92%
Training [30%] Loss: 0.5841    Accuracy: 72.92%
Training [35%] Loss: 0.5840    Accuracy: 72.92%
Training [40%] Loss: 0.5842    Accuracy: 72.92%
Training [45%] Loss: 0.5840    Accuracy: 72.92%
Training [50%] Loss: 0.5841    Accuracy: 72.92%
Training [55%] Loss: 0.5842    Accuracy: 72.92%
Training [60%] Loss: 0.5841    Accuracy: 72.92%
Training [65%] Loss: 0.5841    Accuracy: 72.92%
Training [70%] Loss: 0.5840    Accuracy: 72.92%
Training [75%] Loss: 0.5840    Accuracy: 72.92%
Training [80%] Loss: 0.5840    Accuracy: 72.92%
Training [85%] Loss: 0.5840    Accuracy: 72.92%
Training [90%] Loss: 0.5842    Accuracy: 72.92%
Training [95%] Loss: 0.5841    Accuracy: 72.92%
Training [100%] Loss: 0.5841   Accuracy: 72.92%

```

Time taken: 385.3488972187042

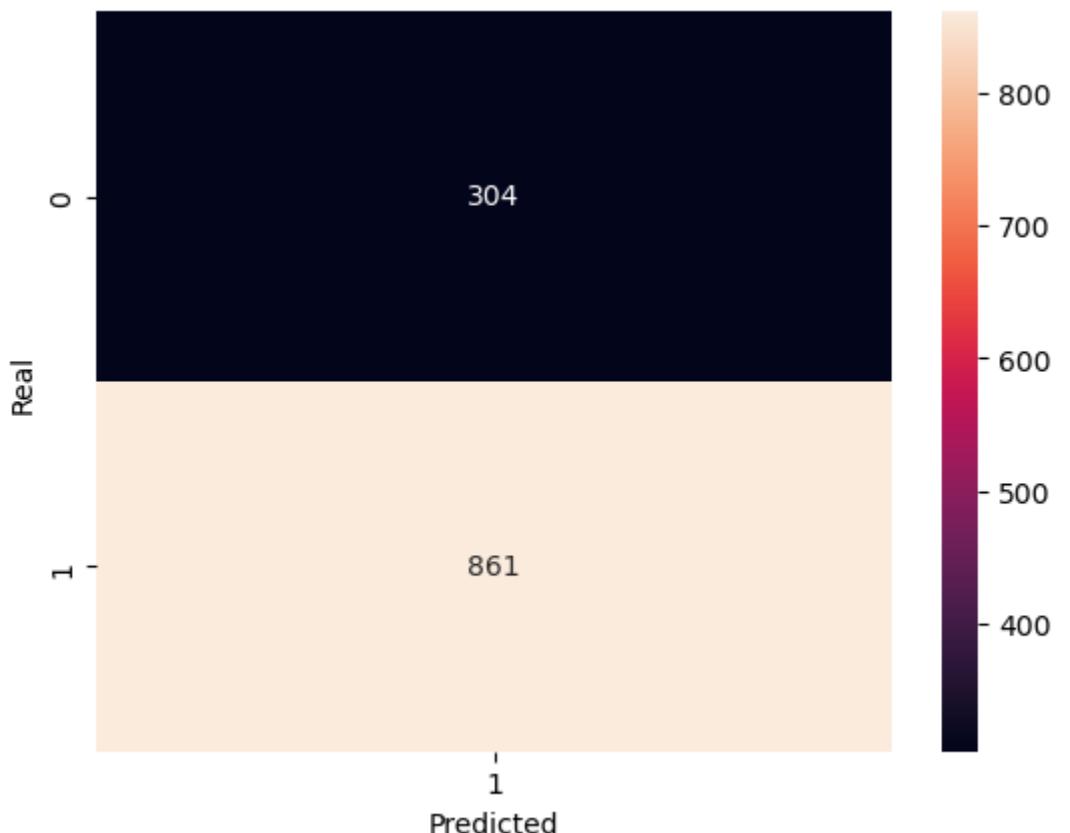
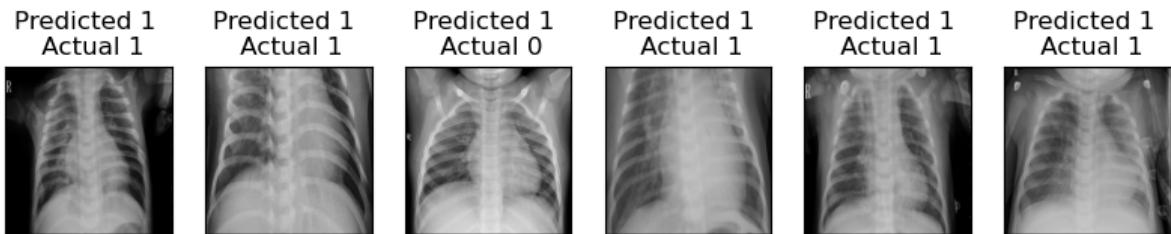
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 385.3488972187042
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr1_optimizerSGD</b>	385.348897	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 16, epochs: 20, learning rate: 1, optimizer: Adam

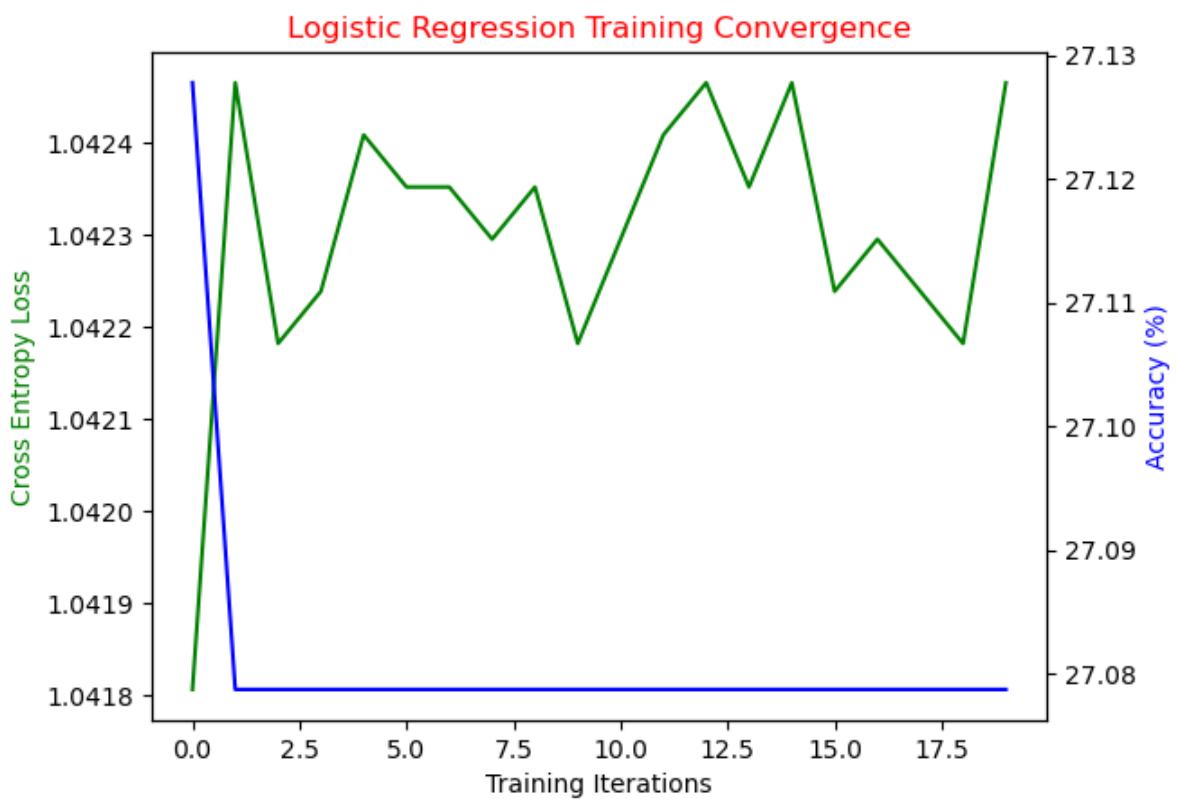
Current: 20/90

```

Training [5%] Loss: 1.0418 Accuracy: 27.13%
Training [10%] Loss: 1.0425 Accuracy: 27.08%
Training [15%] Loss: 1.0422 Accuracy: 27.08%
Training [20%] Loss: 1.0422 Accuracy: 27.08%
Training [25%] Loss: 1.0424 Accuracy: 27.08%
Training [30%] Loss: 1.0424 Accuracy: 27.08%
Training [35%] Loss: 1.0424 Accuracy: 27.08%
Training [40%] Loss: 1.0423 Accuracy: 27.08%
Training [45%] Loss: 1.0424 Accuracy: 27.08%
Training [50%] Loss: 1.0422 Accuracy: 27.08%
Training [55%] Loss: 1.0423 Accuracy: 27.08%
Training [60%] Loss: 1.0424 Accuracy: 27.08%
Training [65%] Loss: 1.0425 Accuracy: 27.08%
Training [70%] Loss: 1.0424 Accuracy: 27.08%
Training [75%] Loss: 1.0425 Accuracy: 27.08%
Training [80%] Loss: 1.0422 Accuracy: 27.08%
Training [85%] Loss: 1.0423 Accuracy: 27.08%
Training [90%] Loss: 1.0422 Accuracy: 27.08%
Training [95%] Loss: 1.0422 Accuracy: 27.08%
Training [100%] Loss: 1.0425 Accuracy: 27.08%

```

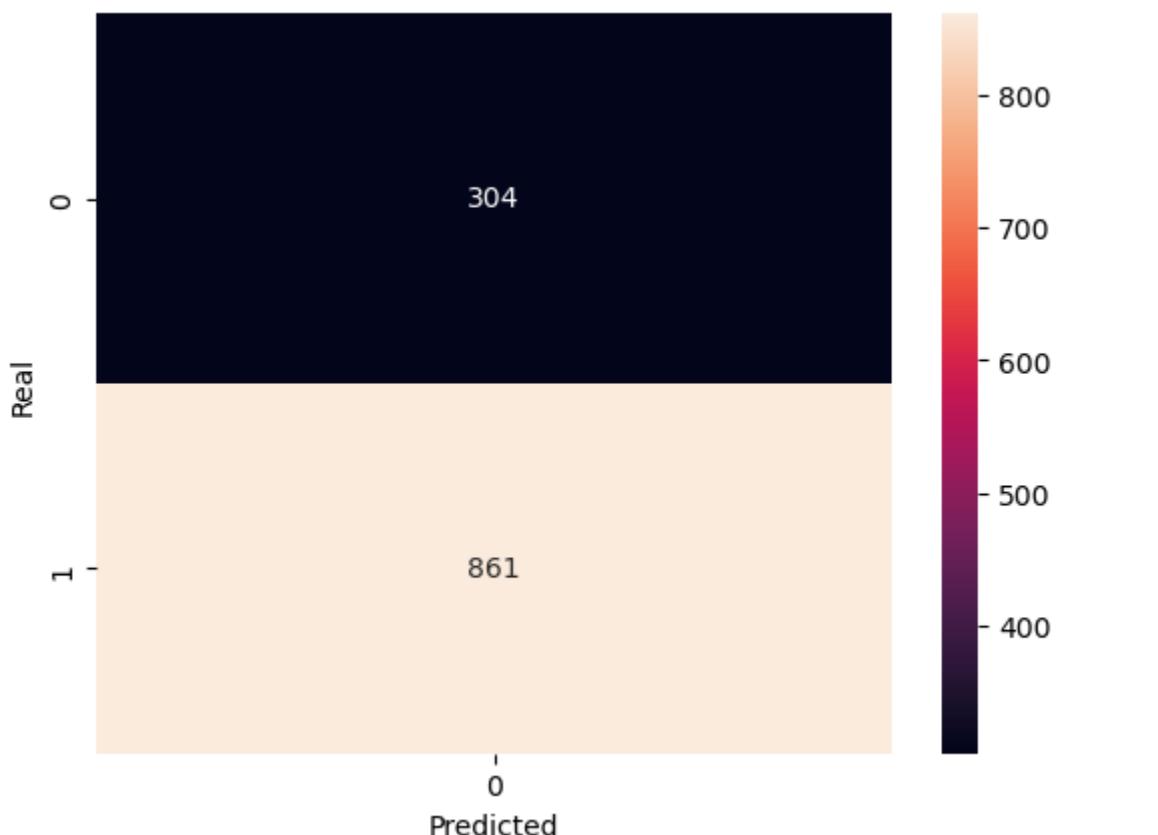
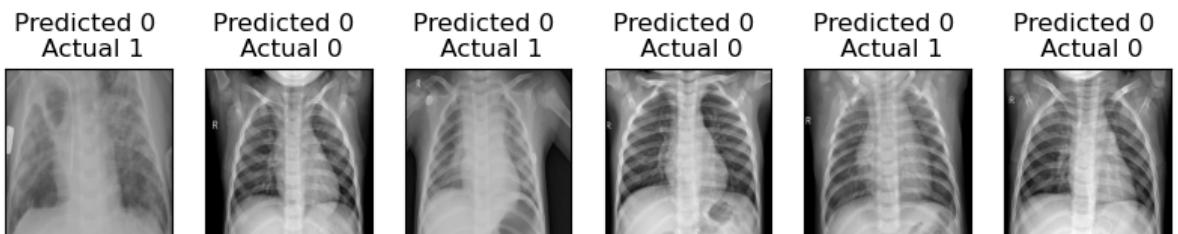
Time taken: 485.68366956710815



Performance on test data:

Loss: 1.0505

Accuracy: 26.09%



```

Time taken: 485.68366956710815
Test size: 1165
Total Accuracy: 0.2609442060085837
Total Precision: 0.0
Total Recall: 0.0
Total F1 Score: 0.0
Classification Report:

```

	precision	recall	f1-score	support
0	0.26	1.00	0.41	304
1	0.00	0.00	0.00	861
accuracy			0.26	1165
macro avg	0.13	0.50	0.21	1165
weighted avg	0.07	0.26	0.11	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 due to no
predicted samples. Use `zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs20_lr1_optimizerAdam</b>	485.68367	0.260944	0.0	0.0	0.0

Data Stored Successfully

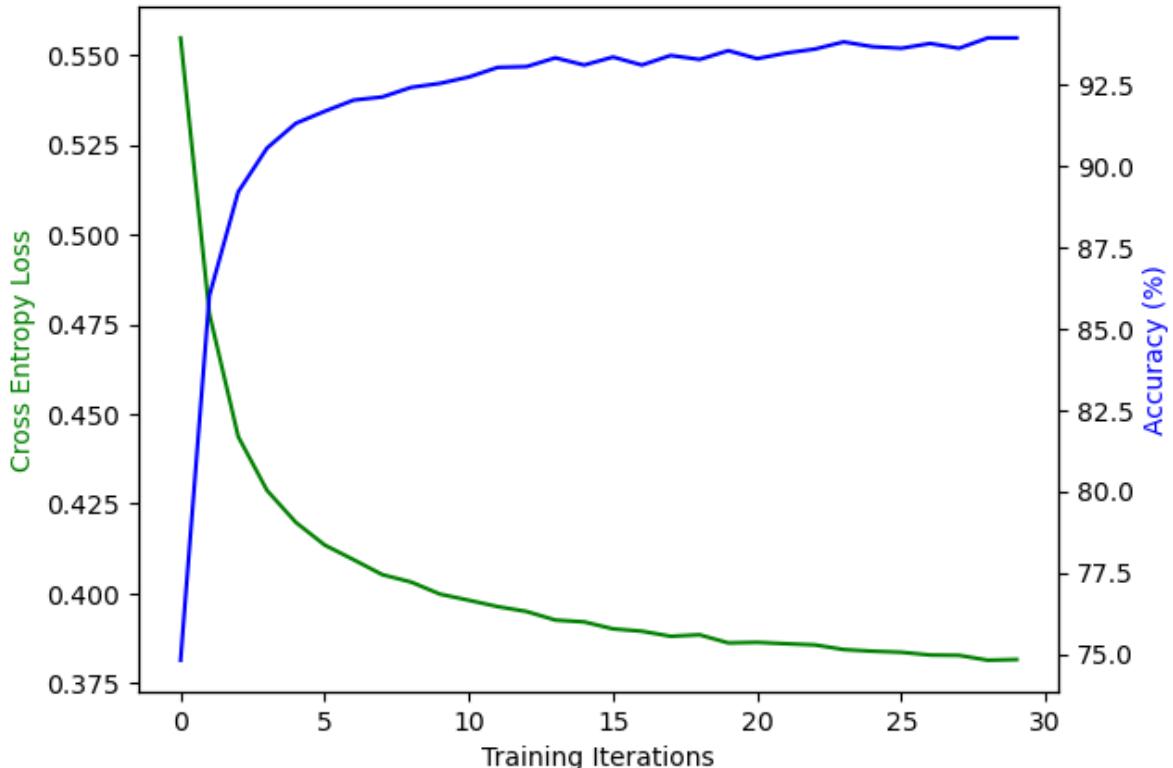
Training with batch size: 16, epochs: 30, learning rate: 0.0001, optimizer: SGD

Current: 21/90

Training [3%]	Loss: 0.5548	Accuracy: 74.81%
Training [7%]	Loss: 0.4780	Accuracy: 86.02%
Training [10%]	Loss: 0.4437	Accuracy: 89.21%
Training [13%]	Loss: 0.4287	Accuracy: 90.56%
Training [17%]	Loss: 0.4198	Accuracy: 91.32%
Training [20%]	Loss: 0.4135	Accuracy: 91.69%
Training [23%]	Loss: 0.4094	Accuracy: 92.03%
Training [27%]	Loss: 0.4052	Accuracy: 92.13%
Training [30%]	Loss: 0.4032	Accuracy: 92.42%
Training [33%]	Loss: 0.3998	Accuracy: 92.54%
Training [37%]	Loss: 0.3981	Accuracy: 92.74%
Training [40%]	Loss: 0.3963	Accuracy: 93.03%
Training [43%]	Loss: 0.3950	Accuracy: 93.06%
Training [47%]	Loss: 0.3926	Accuracy: 93.33%
Training [50%]	Loss: 0.3921	Accuracy: 93.11%
Training [53%]	Loss: 0.3901	Accuracy: 93.35%
Training [57%]	Loss: 0.3895	Accuracy: 93.11%
Training [60%]	Loss: 0.3881	Accuracy: 93.40%
Training [63%]	Loss: 0.3885	Accuracy: 93.28%
Training [67%]	Loss: 0.3862	Accuracy: 93.55%
Training [70%]	Loss: 0.3864	Accuracy: 93.30%
Training [73%]	Loss: 0.3860	Accuracy: 93.48%
Training [77%]	Loss: 0.3857	Accuracy: 93.60%
Training [80%]	Loss: 0.3844	Accuracy: 93.82%
Training [83%]	Loss: 0.3839	Accuracy: 93.67%
Training [87%]	Loss: 0.3836	Accuracy: 93.62%
Training [90%]	Loss: 0.3829	Accuracy: 93.77%
Training [93%]	Loss: 0.3828	Accuracy: 93.62%
Training [97%]	Loss: 0.3814	Accuracy: 93.94%
Training [100%]	Loss: 0.3816	Accuracy: 93.94%

Time taken: 582.5460975170135

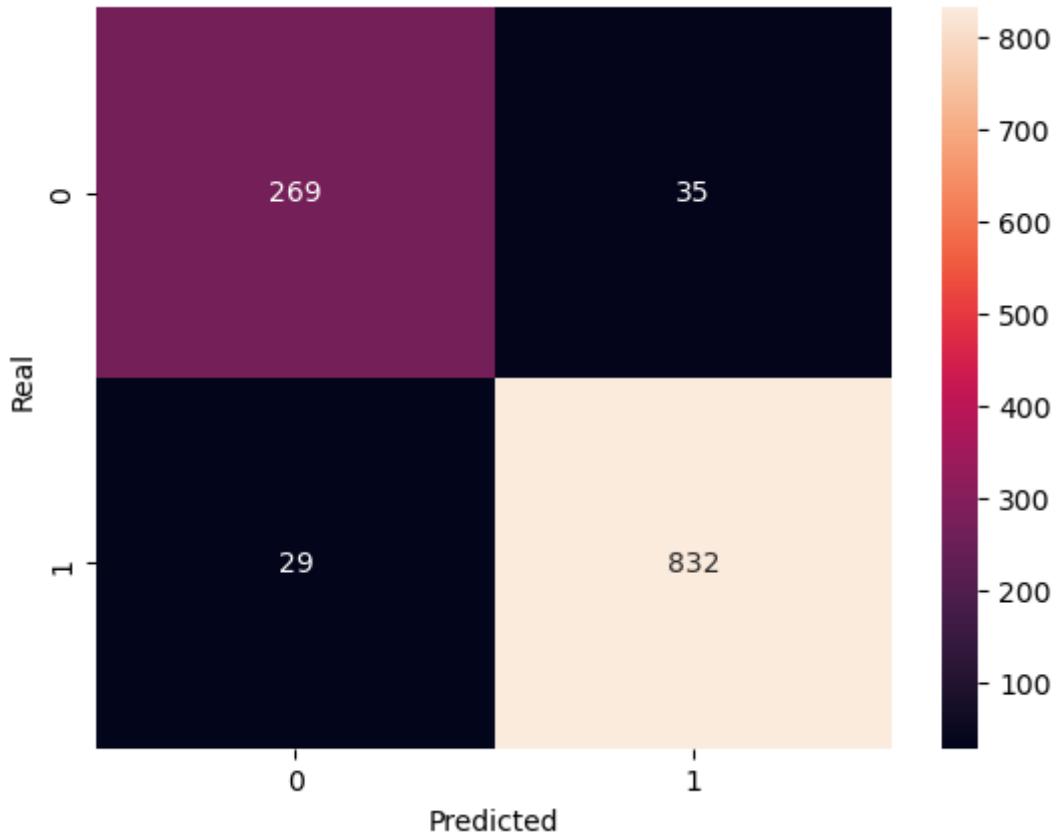
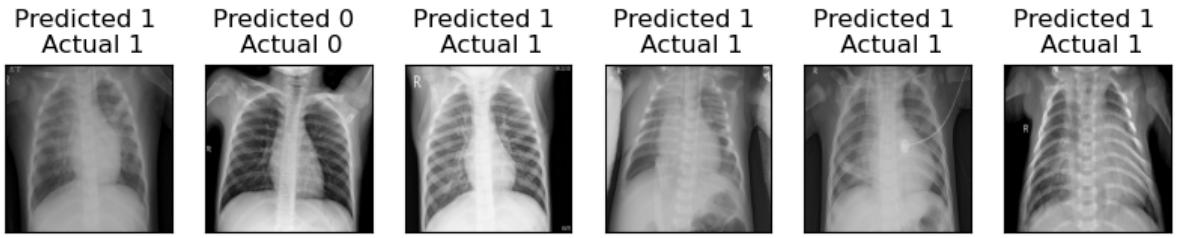
Logistic Regression Training Convergence



Performance on test data:

Loss: 0.3755

Accuracy: 94.51%



Time taken: 582.5460975170135

Test size: 1165

Total Accuracy: 0.9450643776824035

Total Precision: 0.9596309111880046

Total Recall: 0.9663182346109176

Total F1 Score: 0.962962962962963

Classification Report:

	precision	recall	f1-score	support
0	0.90	0.88	0.89	304
1	0.96	0.97	0.96	861
accuracy			0.95	1165
macro avg	0.93	0.93	0.93	1165
weighted avg	0.94	0.95	0.94	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch16_epochs30_lr0.0001_optimizerSGD	582.546098	0.945064	0.959631	0.966318	0.96296

Data Stored Successfully

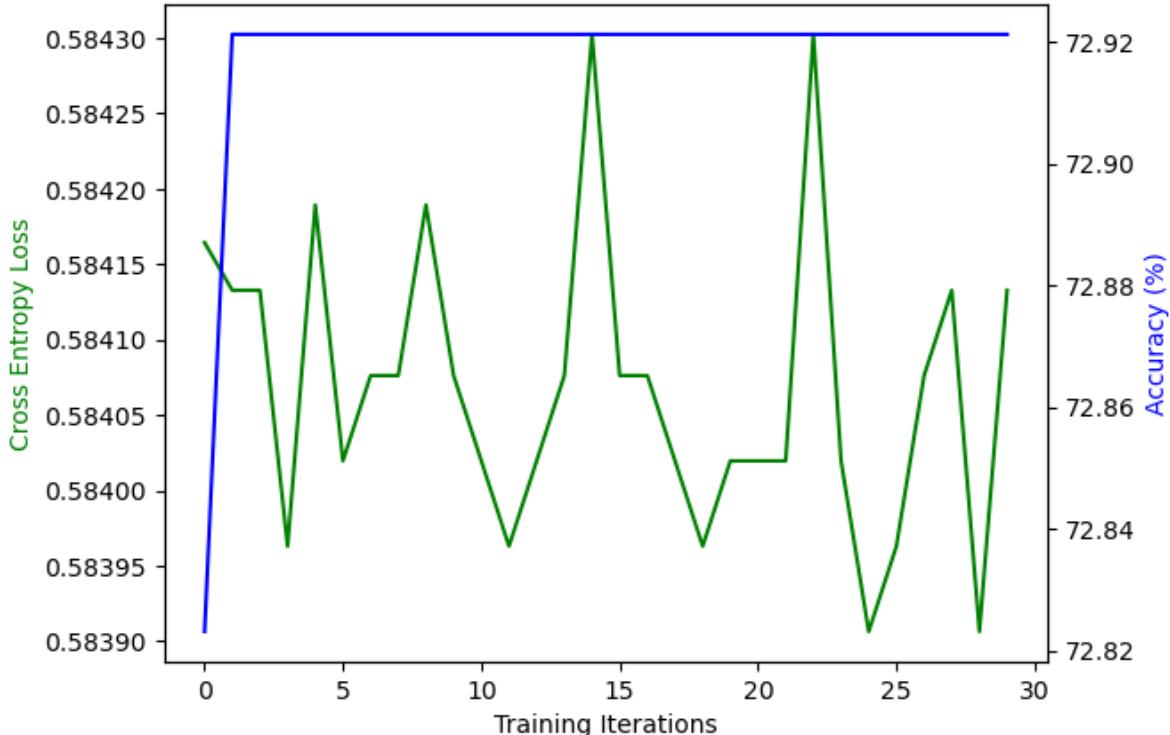
Training with batch size: 16, epochs: 30, learning rate: 0.0001, optimizer: Adam

Current: 22/90

Training [3%]	Loss: 0.5842	Accuracy: 72.82%
Training [7%]	Loss: 0.5841	Accuracy: 72.92%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [13%]	Loss: 0.5840	Accuracy: 72.92%
Training [17%]	Loss: 0.5842	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [23%]	Loss: 0.5841	Accuracy: 72.92%
Training [27%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [33%]	Loss: 0.5841	Accuracy: 72.92%
Training [37%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [43%]	Loss: 0.5840	Accuracy: 72.92%
Training [47%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5843	Accuracy: 72.92%
Training [53%]	Loss: 0.5841	Accuracy: 72.92%
Training [57%]	Loss: 0.5841	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [63%]	Loss: 0.5840	Accuracy: 72.92%
Training [67%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [73%]	Loss: 0.5840	Accuracy: 72.92%
Training [77%]	Loss: 0.5843	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [83%]	Loss: 0.5839	Accuracy: 72.92%
Training [87%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [93%]	Loss: 0.5841	Accuracy: 72.92%
Training [97%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 703.2330949306488

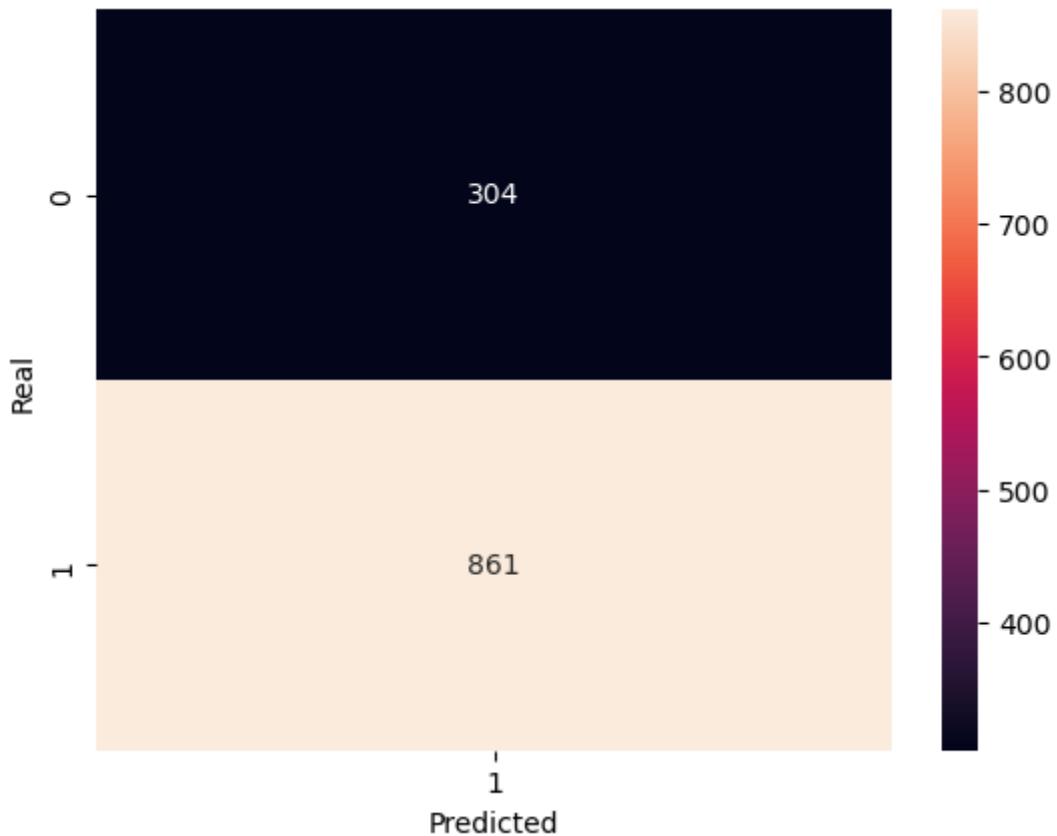
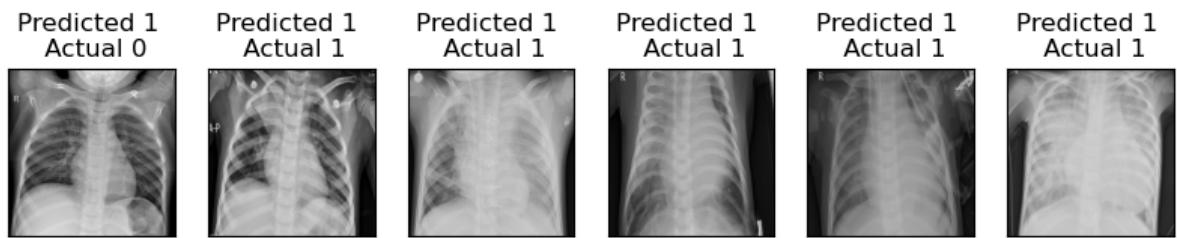
Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 703.2330949306488

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

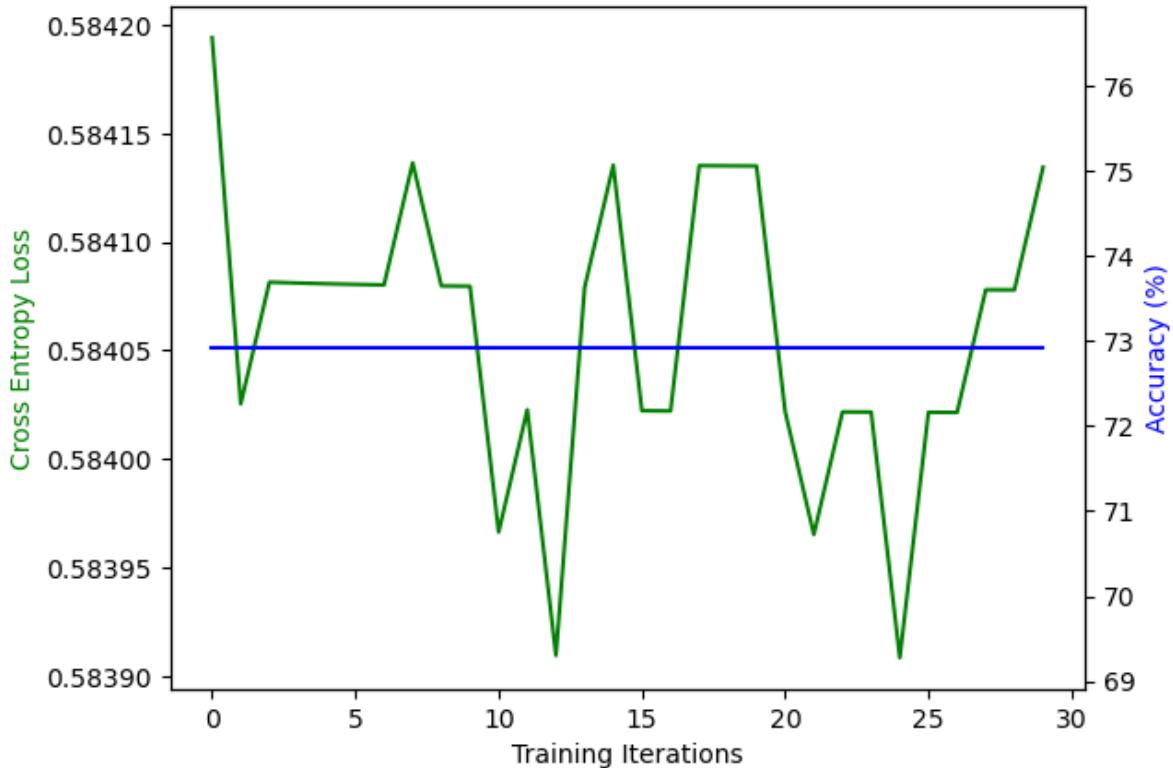
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs30_lr0.0001_optimizerAdam</b>	703.233095	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 16, epochs: 30, learning rate: 0.001, optimizer: SGD  
Current: 23/90

Training [3%]	Loss: 0.5842	Accuracy: 72.92%
Training [7%]	Loss: 0.5840	Accuracy: 72.92%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [13%]	Loss: 0.5841	Accuracy: 72.92%
Training [17%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [23%]	Loss: 0.5841	Accuracy: 72.92%
Training [27%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [33%]	Loss: 0.5841	Accuracy: 72.92%
Training [37%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [43%]	Loss: 0.5839	Accuracy: 72.92%
Training [47%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [53%]	Loss: 0.5840	Accuracy: 72.92%
Training [57%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5841	Accuracy: 72.92%
Training [63%]	Loss: 0.5841	Accuracy: 72.92%
Training [67%]	Loss: 0.5841	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [73%]	Loss: 0.5840	Accuracy: 72.92%
Training [77%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [83%]	Loss: 0.5839	Accuracy: 72.92%
Training [87%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5840	Accuracy: 72.92%
Training [93%]	Loss: 0.5841	Accuracy: 72.92%
Training [97%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 581.423731803894

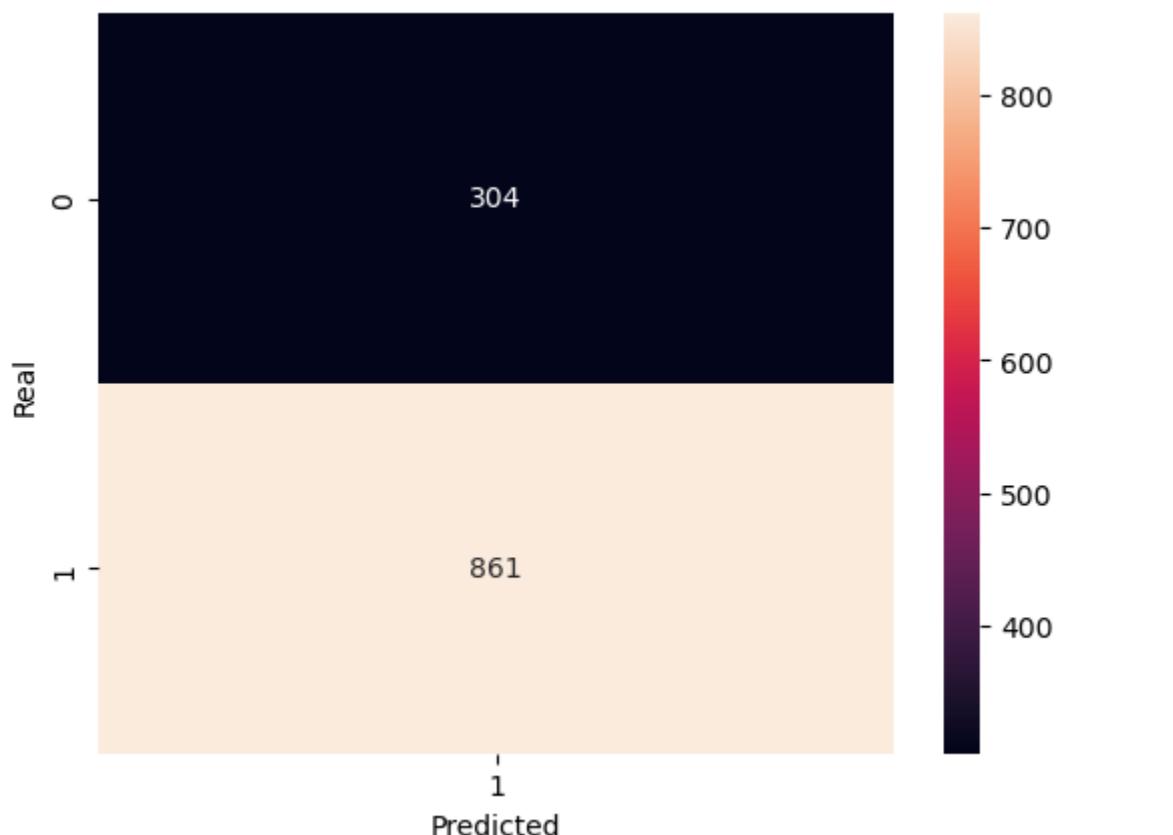
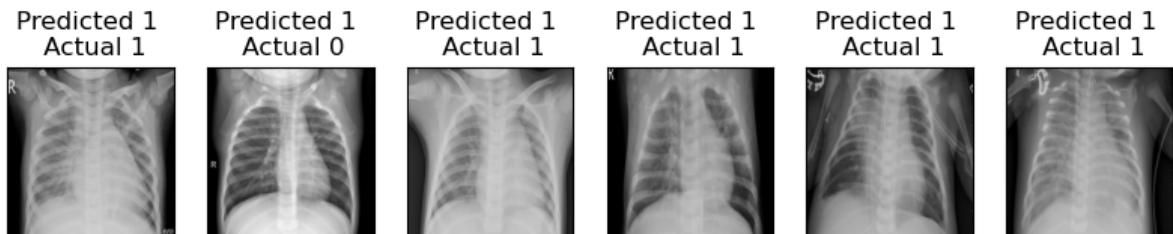
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 581.423731803894
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

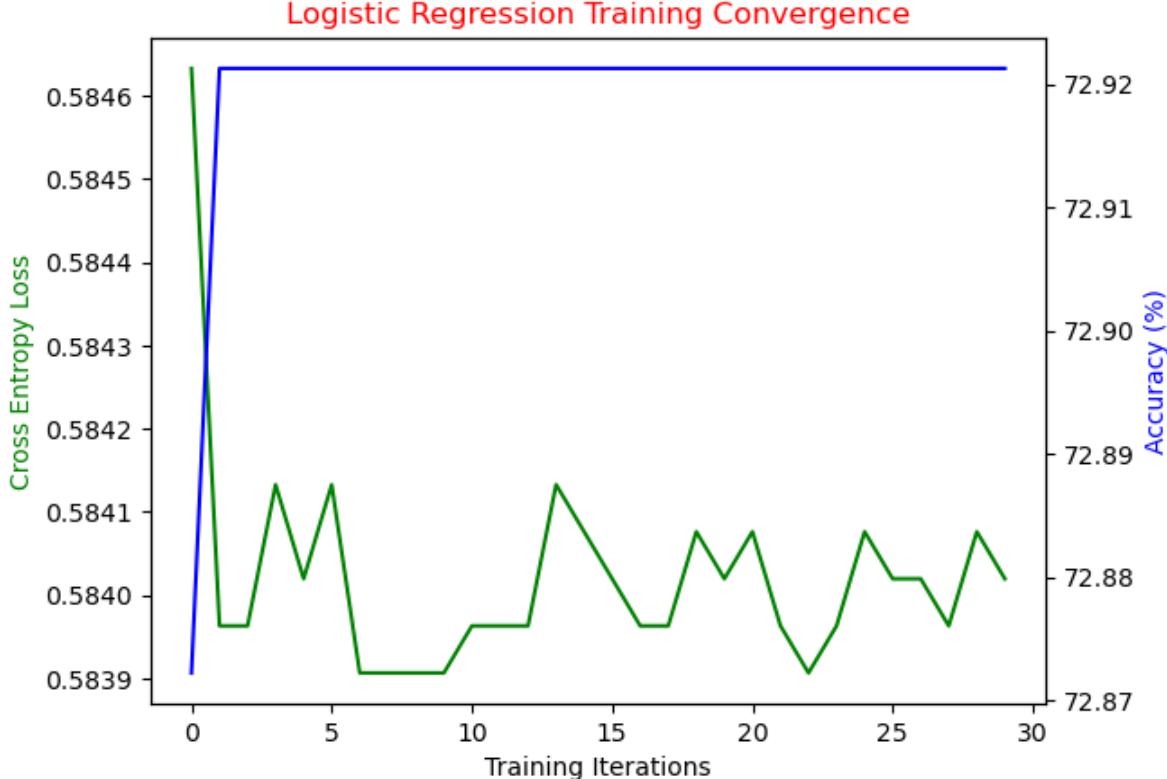
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs30_lr0.001_optimizerSGD</b>	581.423732	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
 Training with batch size: 16, epochs: 30, learning rate: 0.001, optimizer: Adam  
 Current: 24/90

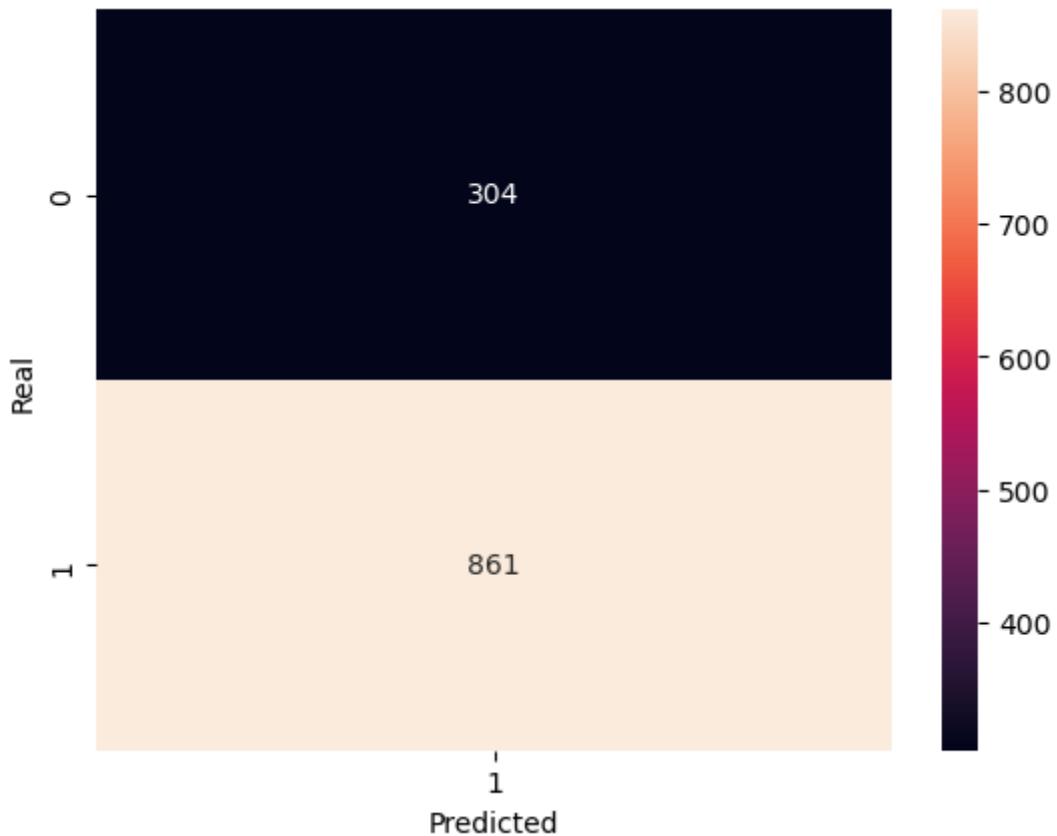
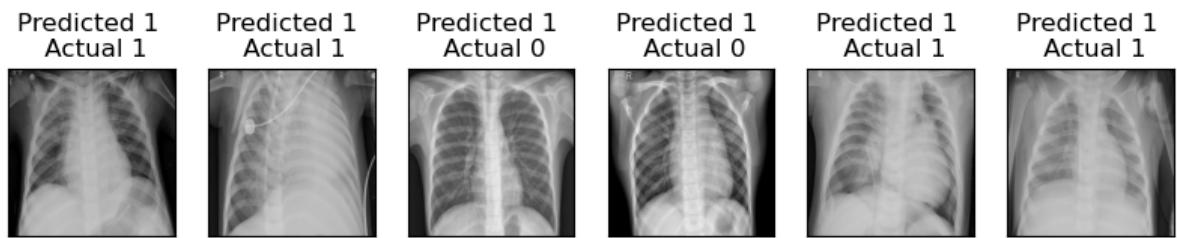
Training [3%]	Loss: 0.5846	Accuracy: 72.87%
Training [7%]	Loss: 0.5840	Accuracy: 72.92%
Training [10%]	Loss: 0.5840	Accuracy: 72.92%
Training [13%]	Loss: 0.5841	Accuracy: 72.92%
Training [17%]	Loss: 0.5840	Accuracy: 72.92%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [23%]	Loss: 0.5839	Accuracy: 72.92%
Training [27%]	Loss: 0.5839	Accuracy: 72.92%
Training [30%]	Loss: 0.5839	Accuracy: 72.92%
Training [33%]	Loss: 0.5839	Accuracy: 72.92%
Training [37%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [43%]	Loss: 0.5840	Accuracy: 72.92%
Training [47%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [53%]	Loss: 0.5840	Accuracy: 72.92%
Training [57%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [63%]	Loss: 0.5841	Accuracy: 72.92%
Training [67%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [73%]	Loss: 0.5840	Accuracy: 72.92%
Training [77%]	Loss: 0.5839	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [83%]	Loss: 0.5841	Accuracy: 72.92%
Training [87%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5840	Accuracy: 72.92%
Training [93%]	Loss: 0.5840	Accuracy: 72.92%
Training [97%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 707.0185761451721



Performance on test data:

Loss: 0.5760  
 Accuracy: 73.91%



Time taken: 707.0185761451721

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch16_epochs30_lr0.001_optimizerAdam</b>	707.018576	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

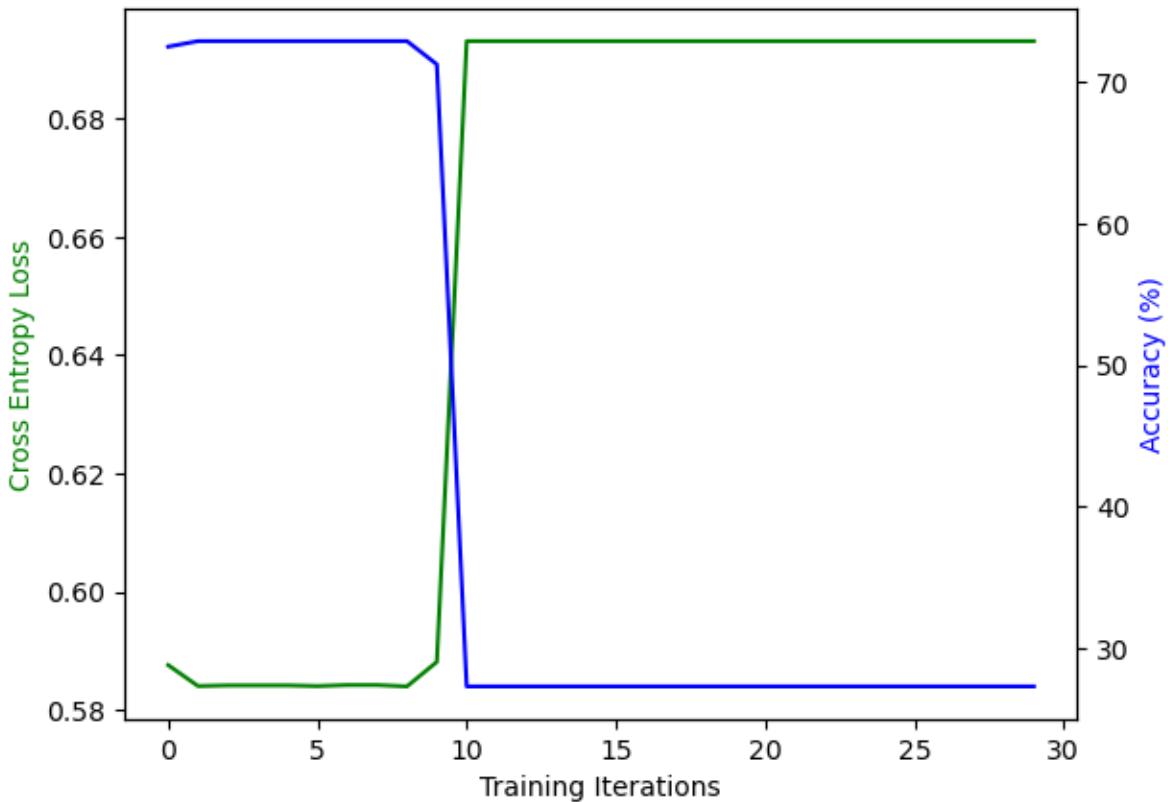
Training with batch size: 16, epochs: 30, learning rate: 0.01, optimizer: SGD

Current: 25/90

Training [3%]	Loss: 0.5876	Accuracy: 72.53%
Training [7%]	Loss: 0.5840	Accuracy: 72.92%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [13%]	Loss: 0.5841	Accuracy: 72.92%
Training [17%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [23%]	Loss: 0.5842	Accuracy: 72.92%
Training [27%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [33%]	Loss: 0.5881	Accuracy: 71.28%
Training [37%]	Loss: 0.6931	Accuracy: 27.27%
Training [40%]	Loss: 0.6931	Accuracy: 27.27%
Training [43%]	Loss: 0.6931	Accuracy: 27.27%
Training [47%]	Loss: 0.6931	Accuracy: 27.27%
Training [50%]	Loss: 0.6931	Accuracy: 27.27%
Training [53%]	Loss: 0.6931	Accuracy: 27.27%
Training [57%]	Loss: 0.6931	Accuracy: 27.27%
Training [60%]	Loss: 0.6931	Accuracy: 27.27%
Training [63%]	Loss: 0.6931	Accuracy: 27.27%
Training [67%]	Loss: 0.6931	Accuracy: 27.27%
Training [70%]	Loss: 0.6931	Accuracy: 27.27%
Training [73%]	Loss: 0.6931	Accuracy: 27.27%
Training [77%]	Loss: 0.6931	Accuracy: 27.27%
Training [80%]	Loss: 0.6931	Accuracy: 27.27%
Training [83%]	Loss: 0.6931	Accuracy: 27.27%
Training [87%]	Loss: 0.6931	Accuracy: 27.27%
Training [90%]	Loss: 0.6931	Accuracy: 27.27%
Training [93%]	Loss: 0.6931	Accuracy: 27.27%
Training [97%]	Loss: 0.6931	Accuracy: 27.27%
Training [100%]	Loss: 0.6931	Accuracy: 27.27%

Time taken: 577.637809753418

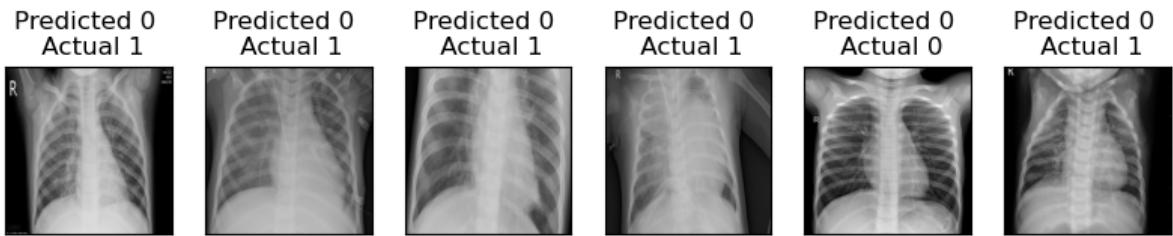
## Logistic Regression Training Convergence

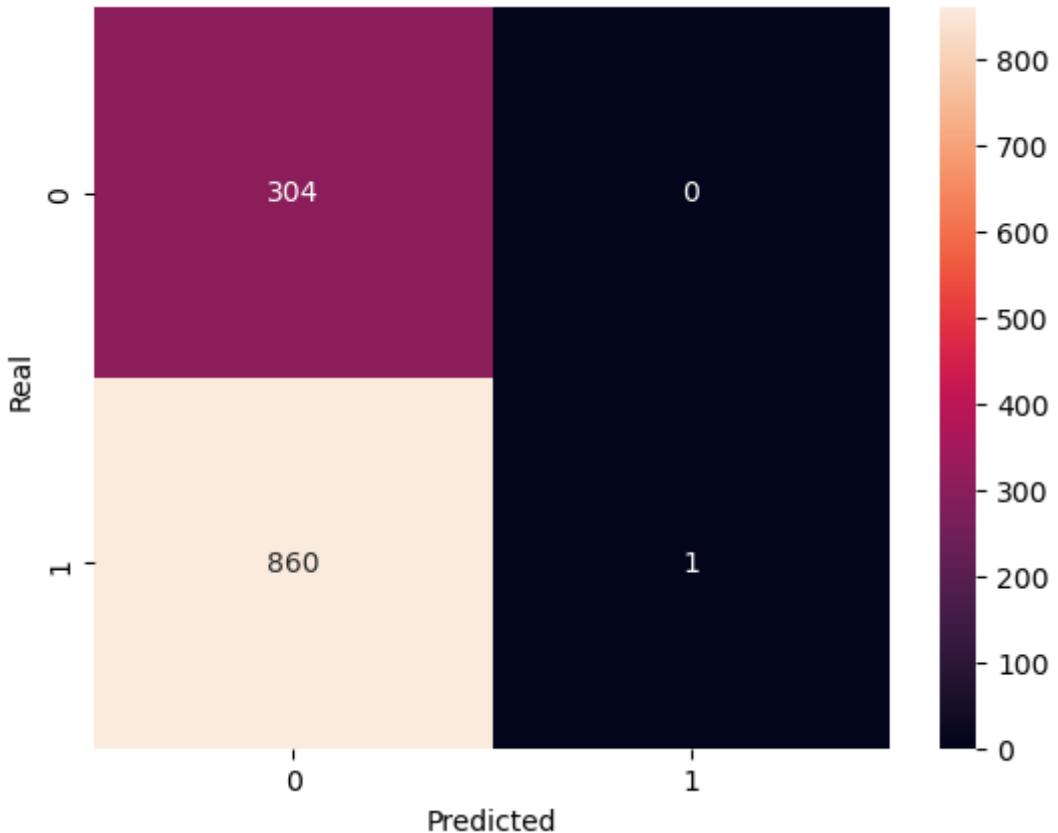


Performance on test data:

Loss: 0.6931

Accuracy: 26.18%





Time taken: 577.637809753418

Test size: 1165

Total Accuracy: 0.26180257510729615

Total Precision: 1.0

Total Recall: 0.0011614401858304297

Total F1 Score: 0.002320185614849188

Classification Report:

	precision	recall	f1-score	support
0	0.26	1.00	0.41	304
1	1.00	0.00	0.00	861
accuracy			0.26	1165
macro avg	0.63	0.50	0.21	1165
weighted avg	0.81	0.26	0.11	1165

	Time	Accuracy	Precision	Recall	F1 score	
<b>Logistic Regression model_batch16_epochs30_lr0.01_optimizerSGD</b>	577.63781	0.261803		1.0	0.001161	0.00232

Data Stored Successfully  
 Training with batch size: 16, epochs: 30, learning rate: 0.01, optimizer: Adam  
 Current: 26/90

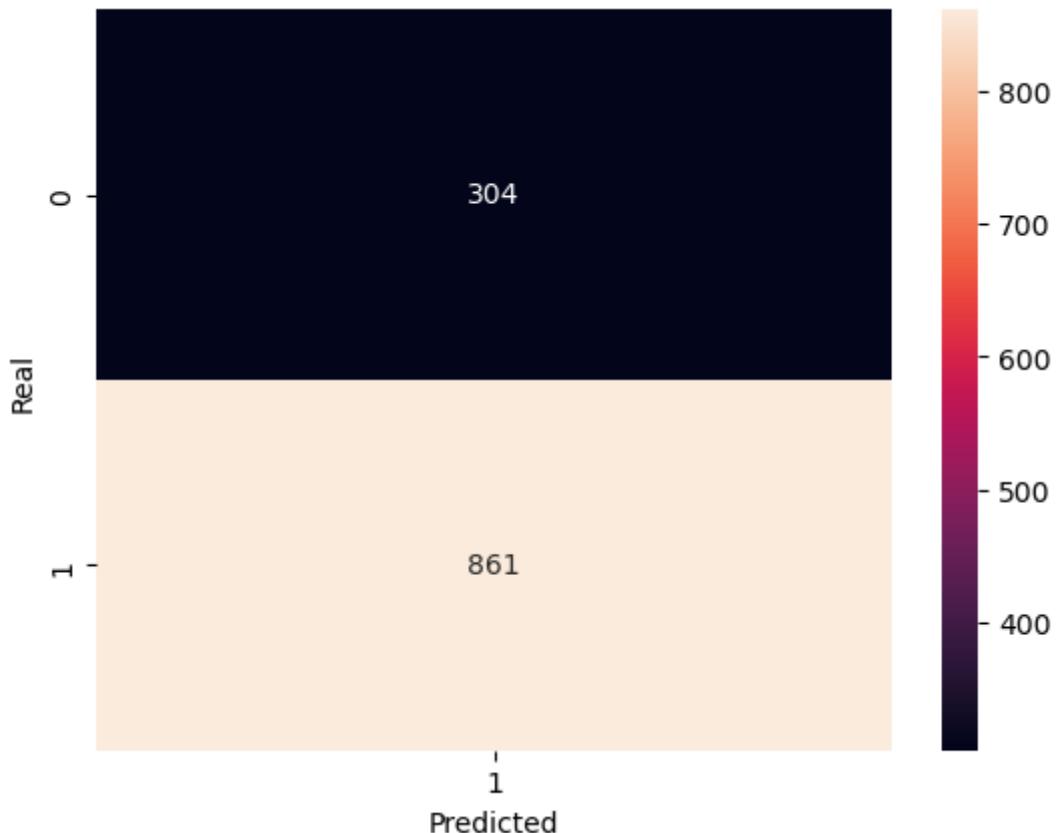
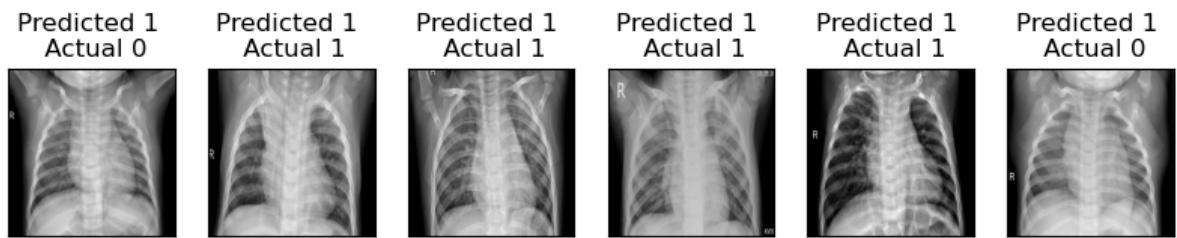
Training [3%]	Loss: 0.5844	Accuracy: 72.77%
Training [7%]	Loss: 0.5840	Accuracy: 72.92%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [13%]	Loss: 0.5841	Accuracy: 72.92%
Training [17%]	Loss: 0.5840	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [23%]	Loss: 0.5841	Accuracy: 72.92%
Training [27%]	Loss: 0.5840	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [33%]	Loss: 0.5842	Accuracy: 72.92%
Training [37%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [43%]	Loss: 0.5840	Accuracy: 72.92%
Training [47%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [53%]	Loss: 0.5840	Accuracy: 72.92%
Training [57%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [63%]	Loss: 0.5841	Accuracy: 72.92%
Training [67%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5838	Accuracy: 72.92%
Training [73%]	Loss: 0.5840	Accuracy: 72.92%
Training [77%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5841	Accuracy: 72.92%
Training [83%]	Loss: 0.5840	Accuracy: 72.92%
Training [87%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [93%]	Loss: 0.5841	Accuracy: 72.92%
Training [97%]	Loss: 0.5840	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 707.8796467781067



Performance on test data:

Loss: 0.5760  
 Accuracy: 73.91%



```
Time taken: 707.8796467781067
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:
```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs30_lr0.01_optimizerAdam</b>	707.879647	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 16, epochs: 30, learning rate: 0.1, optimizer: SGD  
Current: 27/90

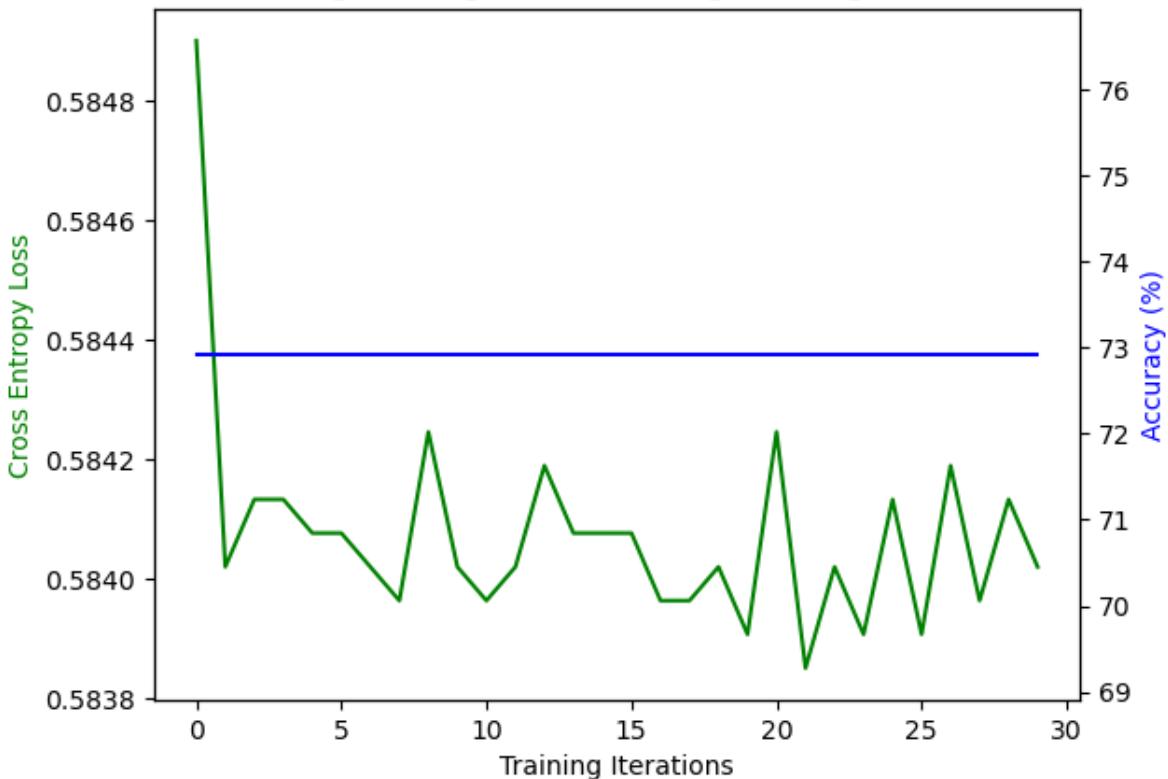
```

Training [3%] Loss: 0.5849 Accuracy: 72.92%
Training [7%] Loss: 0.5840 Accuracy: 72.92%
Training [10%] Loss: 0.5841 Accuracy: 72.92%
Training [13%] Loss: 0.5841 Accuracy: 72.92%
Training [17%] Loss: 0.5841 Accuracy: 72.92%
Training [20%] Loss: 0.5841 Accuracy: 72.92%
Training [23%] Loss: 0.5840 Accuracy: 72.92%
Training [27%] Loss: 0.5840 Accuracy: 72.92%
Training [30%] Loss: 0.5842 Accuracy: 72.92%
Training [33%] Loss: 0.5840 Accuracy: 72.92%
Training [37%] Loss: 0.5840 Accuracy: 72.92%
Training [40%] Loss: 0.5840 Accuracy: 72.92%
Training [43%] Loss: 0.5842 Accuracy: 72.92%
Training [47%] Loss: 0.5841 Accuracy: 72.92%
Training [50%] Loss: 0.5841 Accuracy: 72.92%
Training [53%] Loss: 0.5841 Accuracy: 72.92%
Training [57%] Loss: 0.5840 Accuracy: 72.92%
Training [60%] Loss: 0.5840 Accuracy: 72.92%
Training [63%] Loss: 0.5840 Accuracy: 72.92%
Training [67%] Loss: 0.5839 Accuracy: 72.92%
Training [70%] Loss: 0.5842 Accuracy: 72.92%
Training [73%] Loss: 0.5838 Accuracy: 72.92%
Training [77%] Loss: 0.5840 Accuracy: 72.92%
Training [80%] Loss: 0.5839 Accuracy: 72.92%
Training [83%] Loss: 0.5841 Accuracy: 72.92%
Training [87%] Loss: 0.5839 Accuracy: 72.92%
Training [90%] Loss: 0.5842 Accuracy: 72.92%
Training [93%] Loss: 0.5840 Accuracy: 72.92%
Training [97%] Loss: 0.5841 Accuracy: 72.92%
Training [100%] Loss: 0.5840 Accuracy: 72.92%

```

Time taken: 581.8221063613892

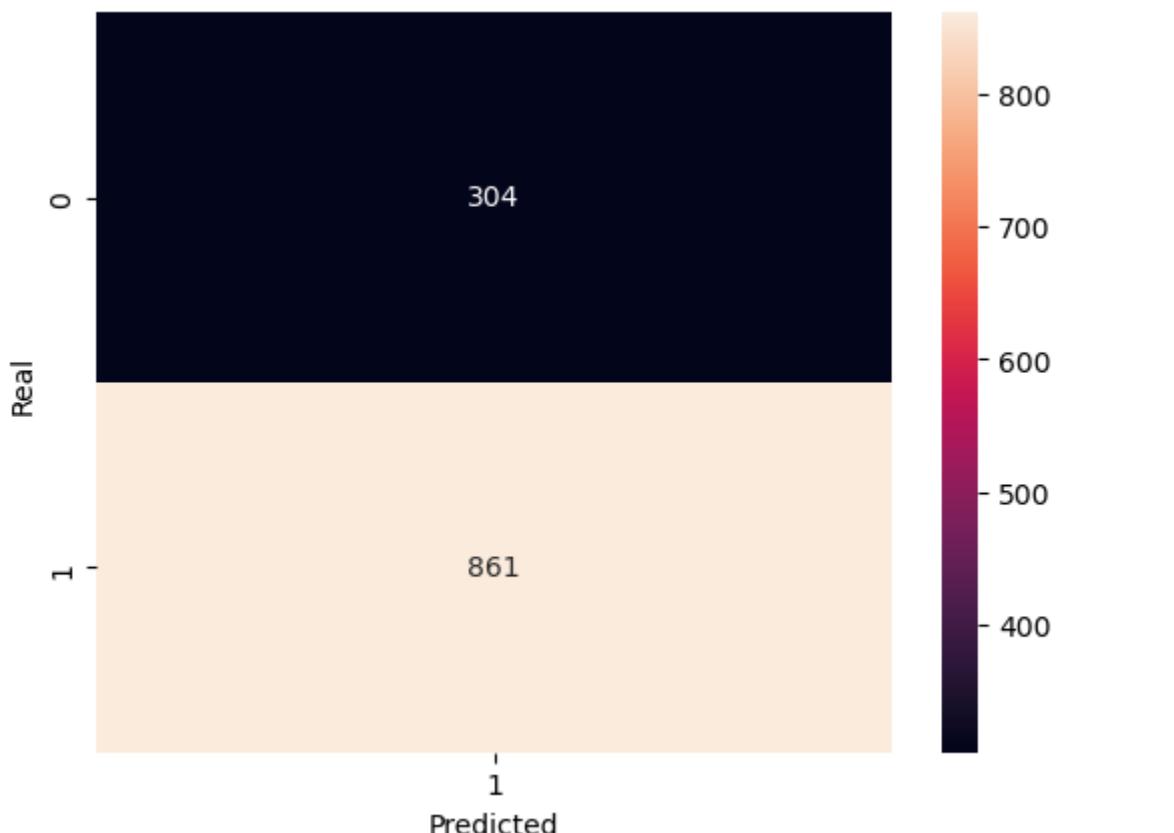
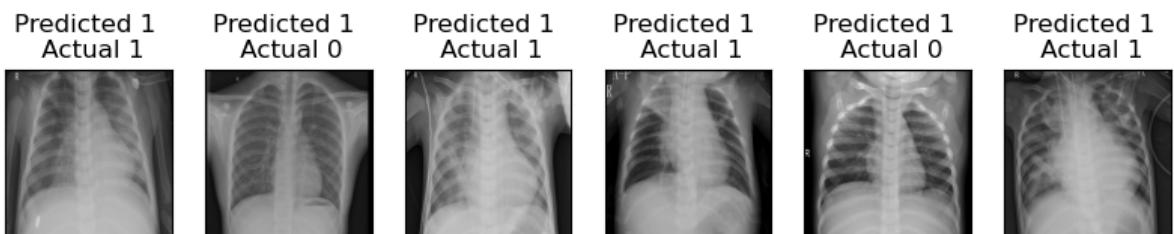
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```
Time taken: 581.8221063613892
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:
```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

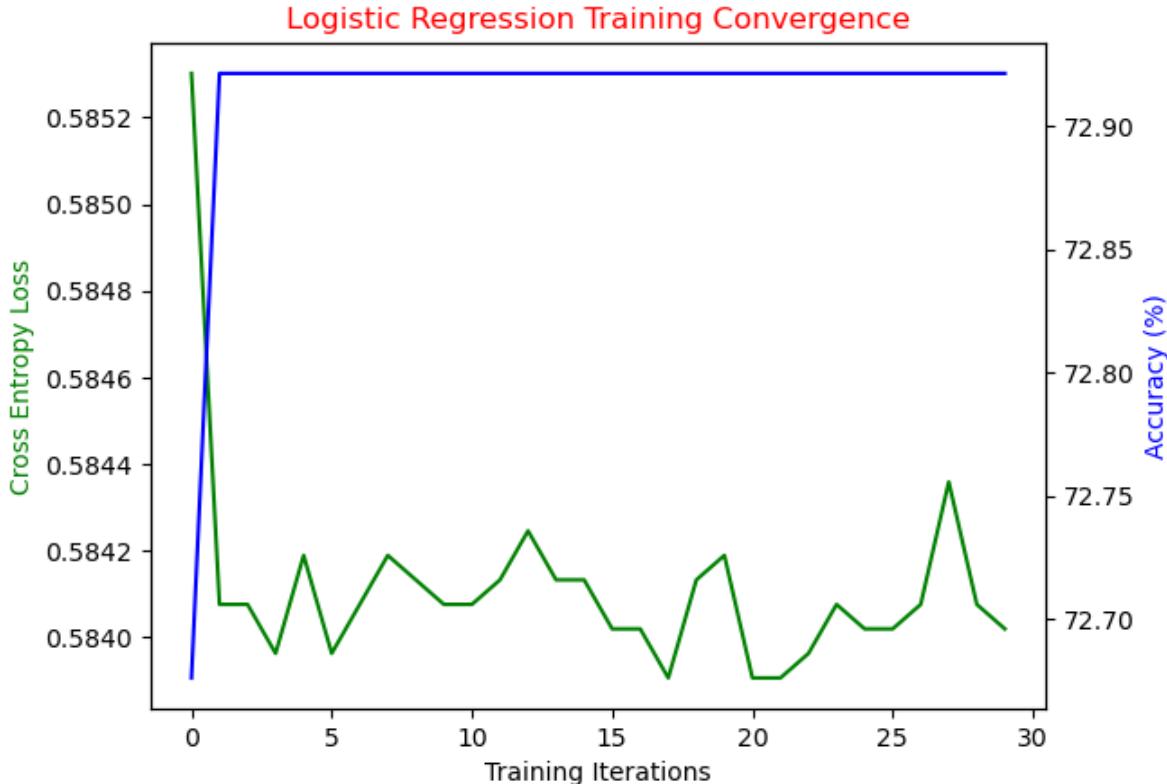
```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs30_lr0.1_optimizerSGD</b>	581.822106	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
 Training with batch size: 16, epochs: 30, learning rate: 0.1, optimizer: Adam  
 Current: 28/90

Training [3%]	Loss: 0.5853	Accuracy: 72.68%
Training [7%]	Loss: 0.5841	Accuracy: 72.92%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [13%]	Loss: 0.5840	Accuracy: 72.92%
Training [17%]	Loss: 0.5842	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [23%]	Loss: 0.5841	Accuracy: 72.92%
Training [27%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [33%]	Loss: 0.5841	Accuracy: 72.92%
Training [37%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [43%]	Loss: 0.5842	Accuracy: 72.92%
Training [47%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [53%]	Loss: 0.5840	Accuracy: 72.92%
Training [57%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5841	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5839	Accuracy: 72.92%
Training [73%]	Loss: 0.5839	Accuracy: 72.92%
Training [77%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5841	Accuracy: 72.92%
Training [83%]	Loss: 0.5840	Accuracy: 72.92%
Training [87%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [93%]	Loss: 0.5844	Accuracy: 72.92%
Training [97%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

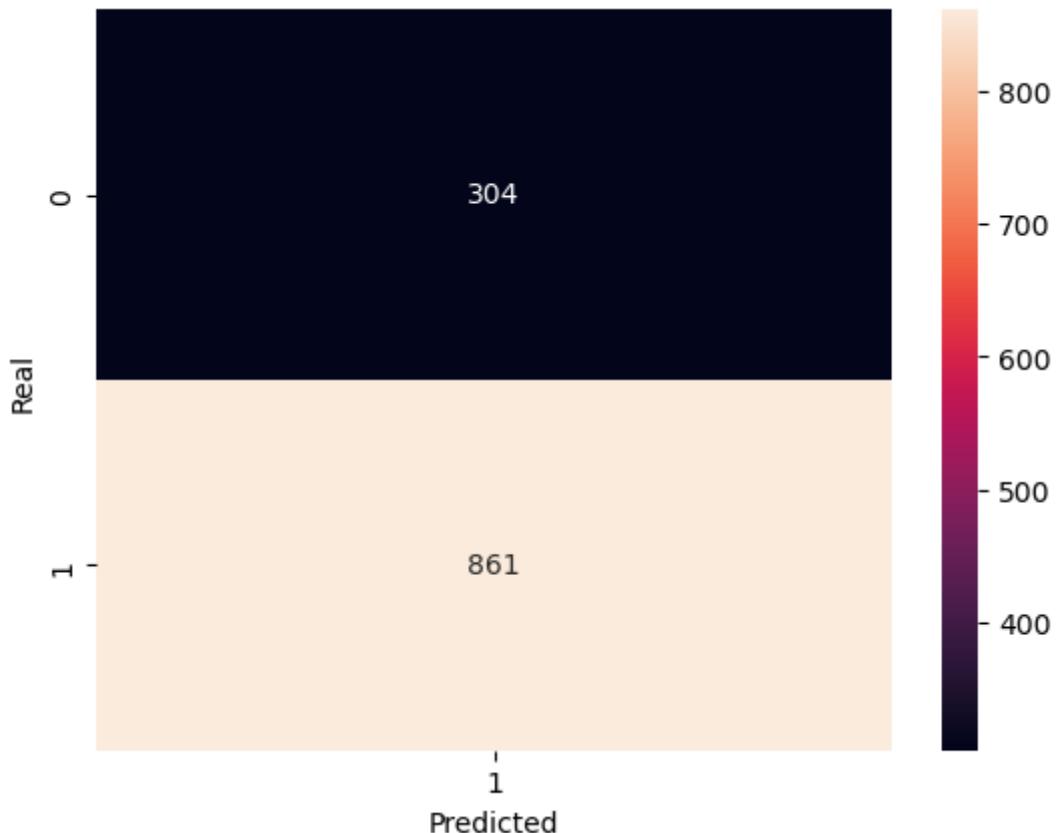
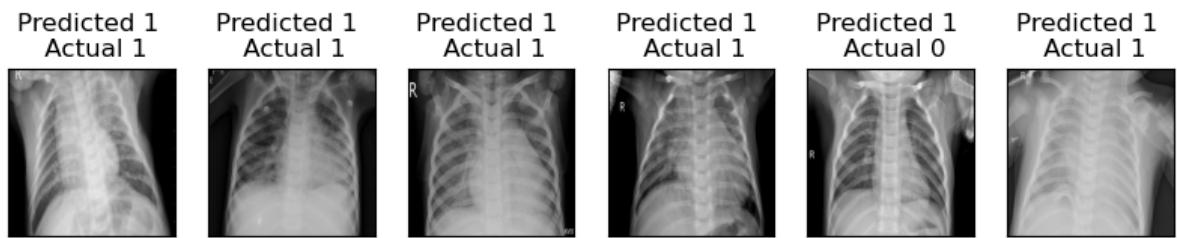
Time taken: 711.5526232719421



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



Time taken: 711.5526232719421

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch16_epochs30_lr0.1_optimizerAdam</b>	711.552623	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

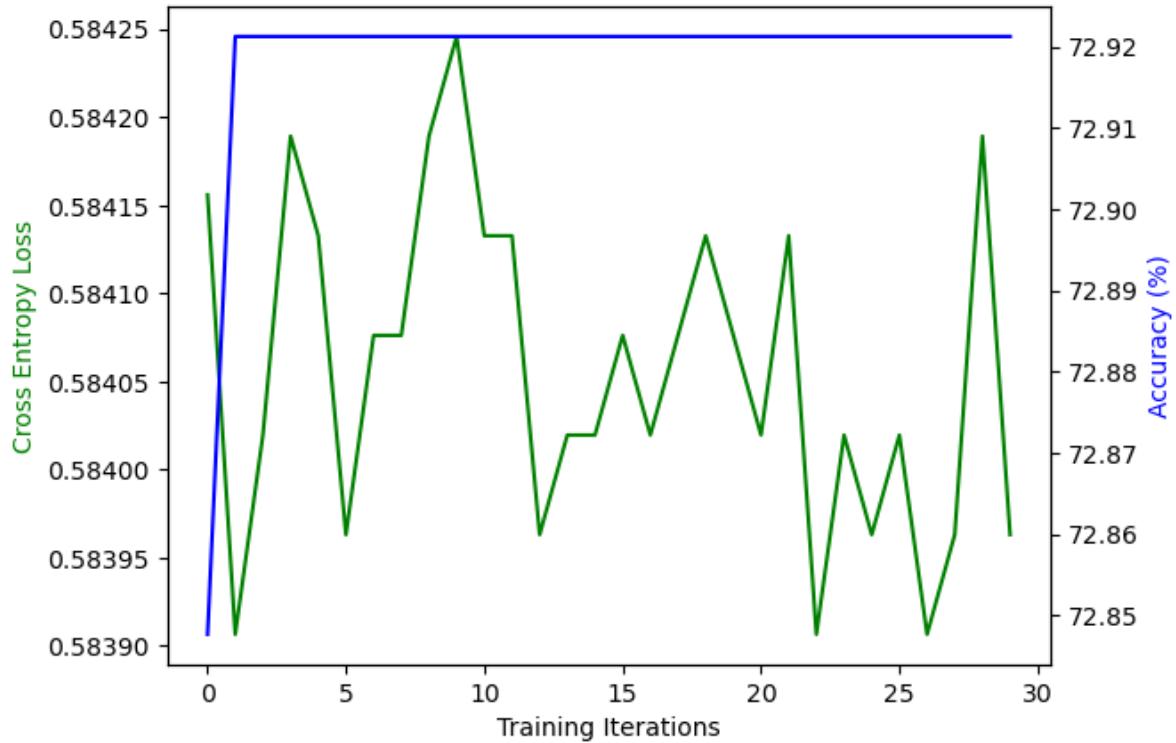
Training with batch size: 16, epochs: 30, learning rate: 1, optimizer: SGD

Current: 29/90

Training [3%]	Loss: 0.5842	Accuracy: 72.85%
Training [7%]	Loss: 0.5839	Accuracy: 72.92%
Training [10%]	Loss: 0.5840	Accuracy: 72.92%
Training [13%]	Loss: 0.5842	Accuracy: 72.92%
Training [17%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [23%]	Loss: 0.5841	Accuracy: 72.92%
Training [27%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [33%]	Loss: 0.5842	Accuracy: 72.92%
Training [37%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [43%]	Loss: 0.5840	Accuracy: 72.92%
Training [47%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [53%]	Loss: 0.5841	Accuracy: 72.92%
Training [57%]	Loss: 0.5840	Accuracy: 72.92%
Training [60%]	Loss: 0.5841	Accuracy: 72.92%
Training [63%]	Loss: 0.5841	Accuracy: 72.92%
Training [67%]	Loss: 0.5841	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [73%]	Loss: 0.5841	Accuracy: 72.92%
Training [77%]	Loss: 0.5839	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [83%]	Loss: 0.5840	Accuracy: 72.92%
Training [87%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [93%]	Loss: 0.5840	Accuracy: 72.92%
Training [97%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 580.5647571086884

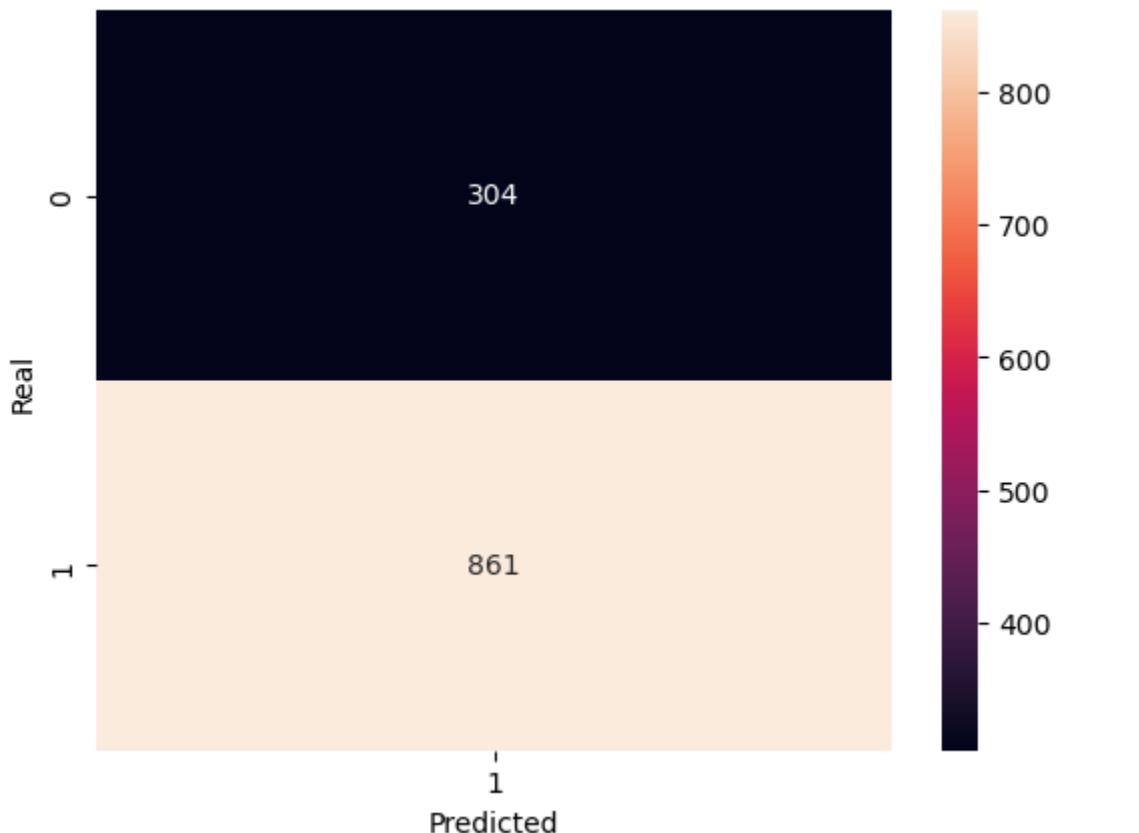
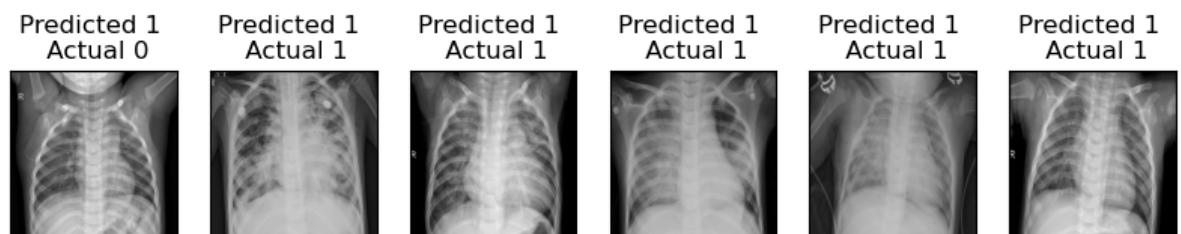
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



```

Time taken: 580.5647571086884
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

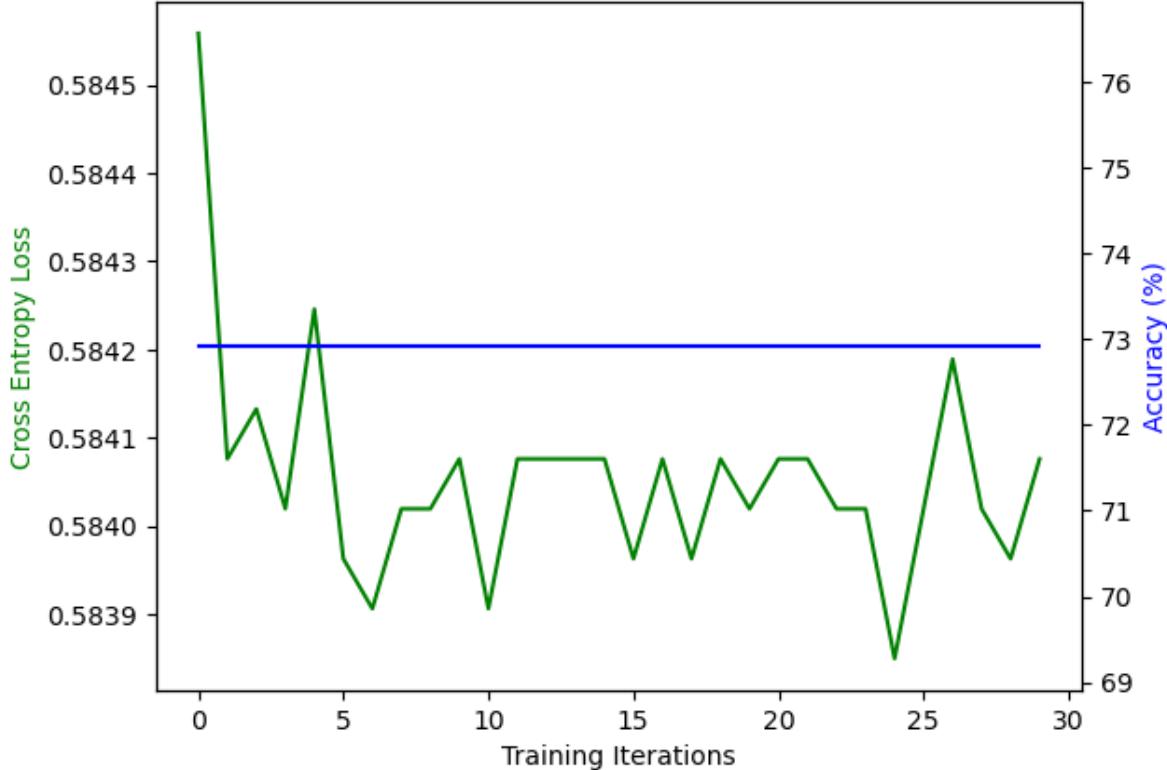
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs30_lr1_optimizerSGD</b>	580.564757	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
 Training with batch size: 16, epochs: 30, learning rate: 1, optimizer: Adam  
 Current: 30/90

Training [3%]	Loss: 0.5846	Accuracy: 72.92%
Training [7%]	Loss: 0.5841	Accuracy: 72.92%
Training [10%]	Loss: 0.5841	Accuracy: 72.92%
Training [13%]	Loss: 0.5840	Accuracy: 72.92%
Training [17%]	Loss: 0.5842	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [23%]	Loss: 0.5839	Accuracy: 72.92%
Training [27%]	Loss: 0.5840	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [33%]	Loss: 0.5841	Accuracy: 72.92%
Training [37%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [43%]	Loss: 0.5841	Accuracy: 72.92%
Training [47%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [53%]	Loss: 0.5840	Accuracy: 72.92%
Training [57%]	Loss: 0.5841	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [63%]	Loss: 0.5841	Accuracy: 72.92%
Training [67%]	Loss: 0.5840	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [73%]	Loss: 0.5841	Accuracy: 72.92%
Training [77%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [83%]	Loss: 0.5838	Accuracy: 72.92%
Training [87%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [93%]	Loss: 0.5840	Accuracy: 72.92%
Training [97%]	Loss: 0.5840	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 739.7941327095032

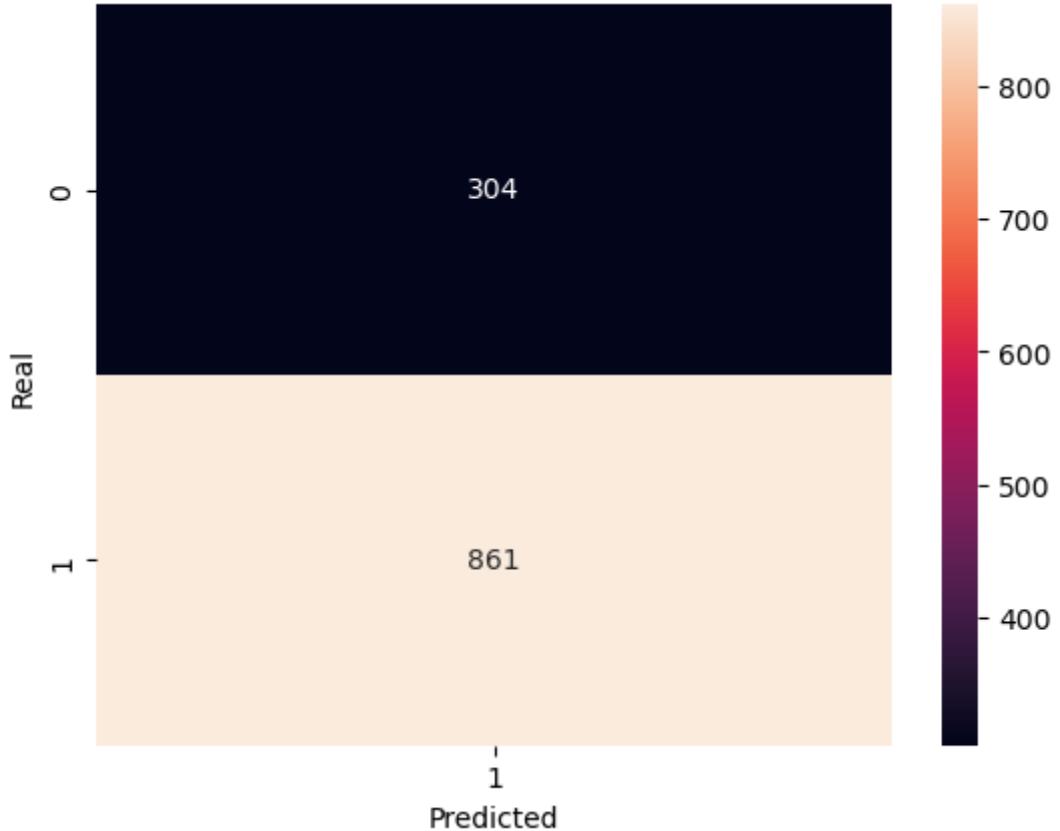
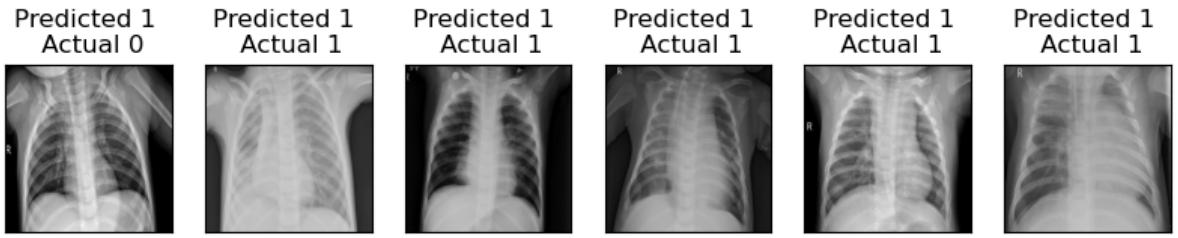
Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5760

Accuracy: 73.91%



	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

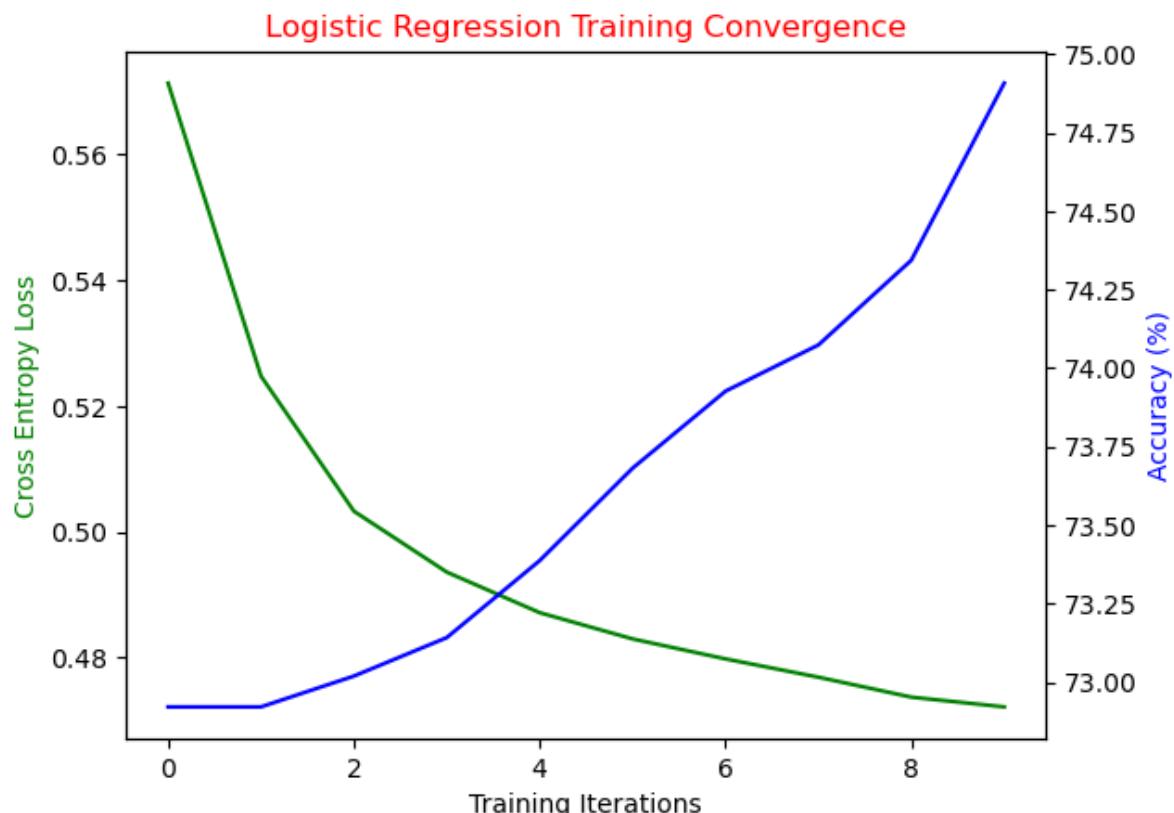
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch16_epochs30_lr1_optimizerAdam</b>	739.794133	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 32, epochs: 10, learning rate: 0.0001, optimizer: SGD  
Current: 31/90

Training [10%]	Loss: 0.5713	Accuracy: 72.92%
Training [20%]	Loss: 0.5247	Accuracy: 72.92%
Training [30%]	Loss: 0.5033	Accuracy: 73.02%
Training [40%]	Loss: 0.4936	Accuracy: 73.14%
Training [50%]	Loss: 0.4872	Accuracy: 73.39%
Training [60%]	Loss: 0.4830	Accuracy: 73.68%
Training [70%]	Loss: 0.4798	Accuracy: 73.93%
Training [80%]	Loss: 0.4769	Accuracy: 74.07%
Training [90%]	Loss: 0.4737	Accuracy: 74.34%
Training [100%]	Loss: 0.4722	Accuracy: 74.91%

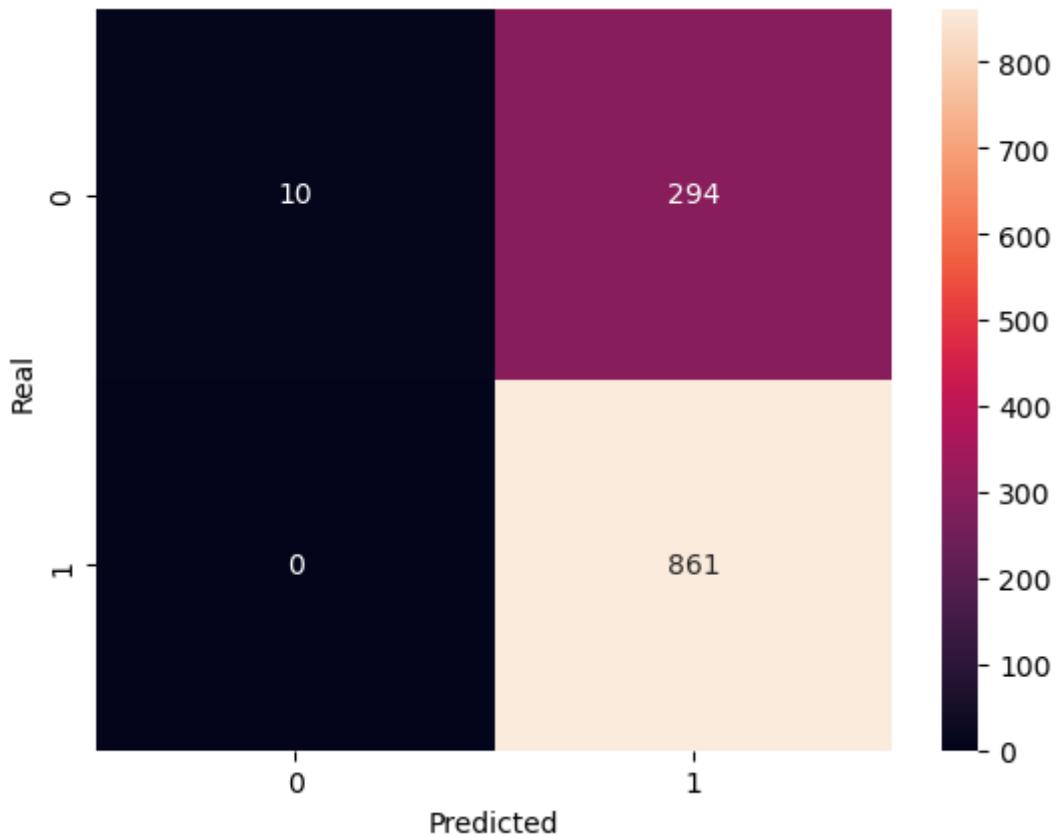
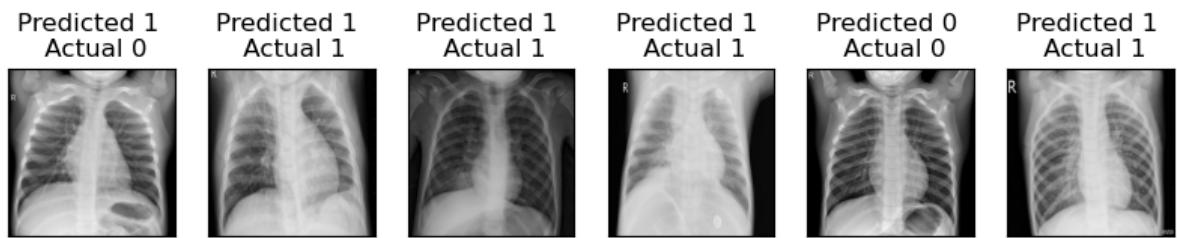
Time taken: 191.06178379058838



Performance on test data:

Loss: 0.4649

Accuracy: 74.76%



	precision	recall	f1-score	support
0	1.00	0.03	0.06	304
1	0.75	1.00	0.85	861
accuracy			0.75	1165
macro avg	0.87	0.52	0.46	1165
weighted avg	0.81	0.75	0.65	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression model_batch32_epochs10_lr0.0001_optimizerSGD</b>	191.061784	0.747639	0.745455	1.0	0.854167

Data Stored Successfully

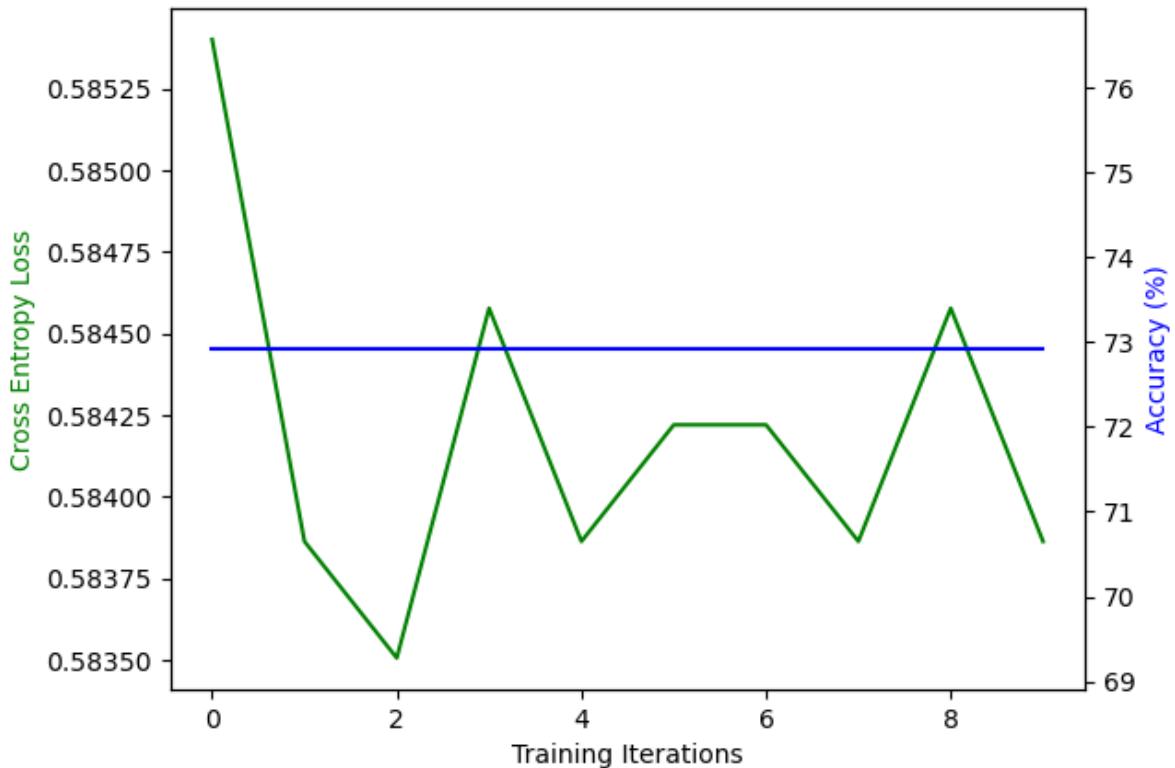
Training with batch size: 32, epochs: 10, learning rate: 0.0001, optimizer: Adam

Current: 32/90

Training [10%]	Loss: 0.5854	Accuracy: 72.92%
Training [20%]	Loss: 0.5839	Accuracy: 72.92%
Training [30%]	Loss: 0.5835	Accuracy: 72.92%
Training [40%]	Loss: 0.5846	Accuracy: 72.92%
Training [50%]	Loss: 0.5839	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [90%]	Loss: 0.5846	Accuracy: 72.92%
Training [100%]	Loss: 0.5839	Accuracy: 72.92%

Time taken: 202.72056889533997

### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5752

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

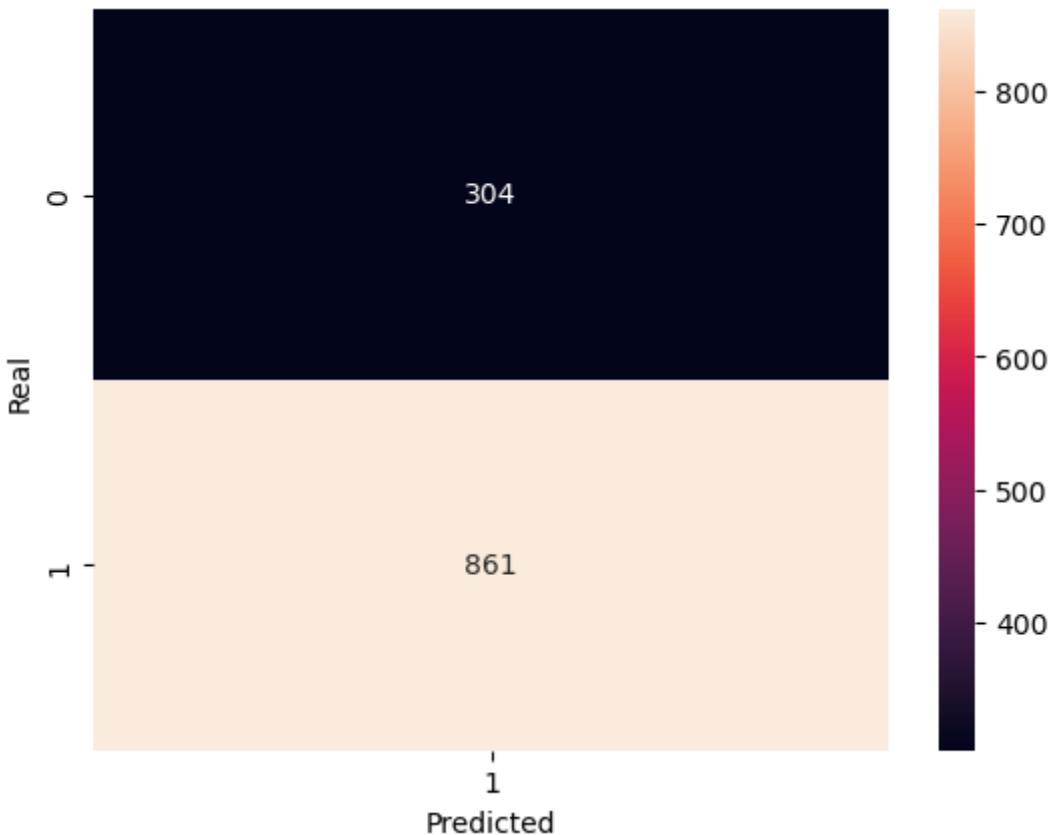


Predicted 1  
Actual 0



Predicted 1  
Actual 1





Time taken: 202.72056889533997

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

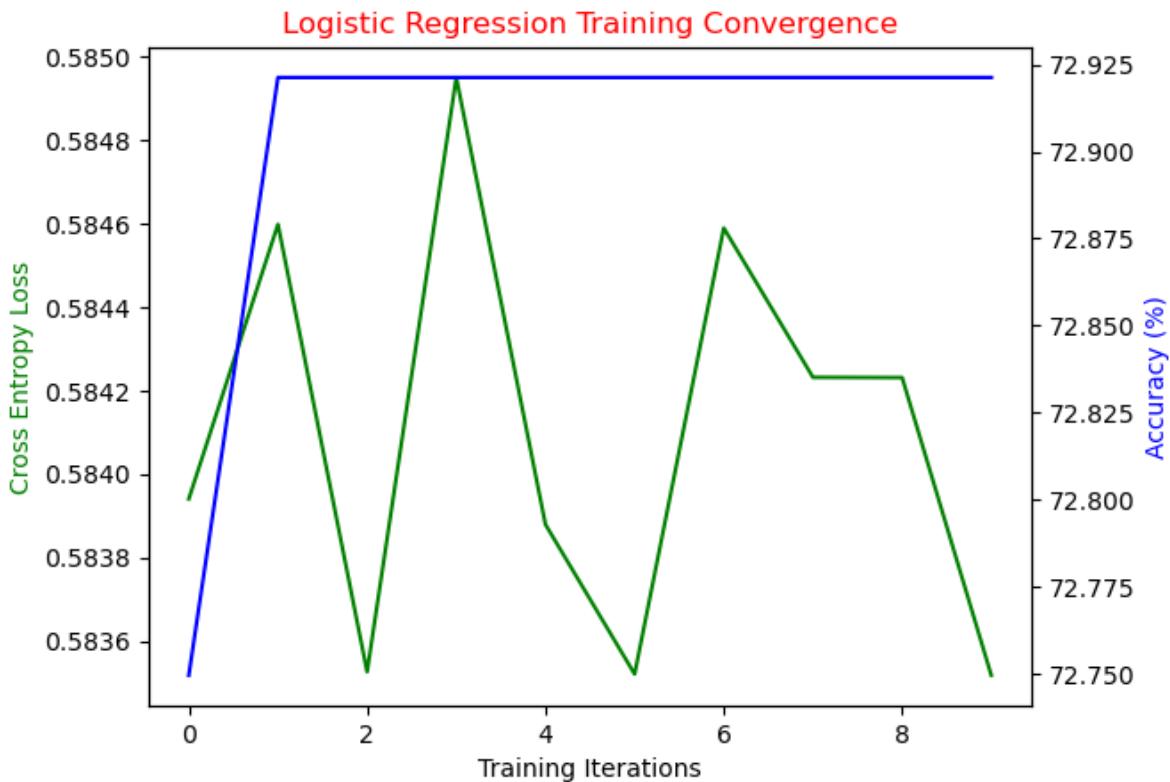
Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

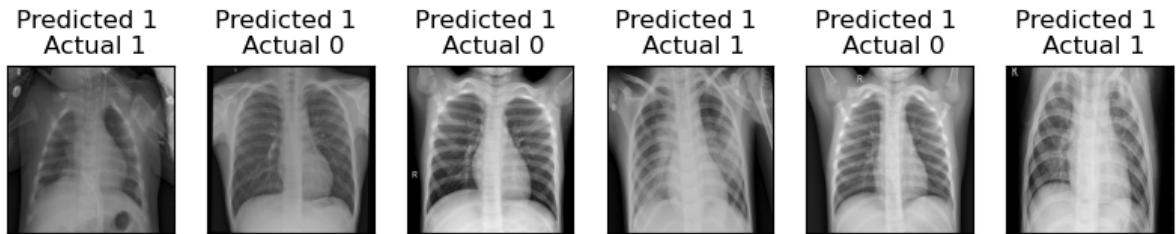
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> model_batch32_epochs10_lr0.0001_optimizerAdam	202.720569	0.739056	0.739056	1.0	0.849951

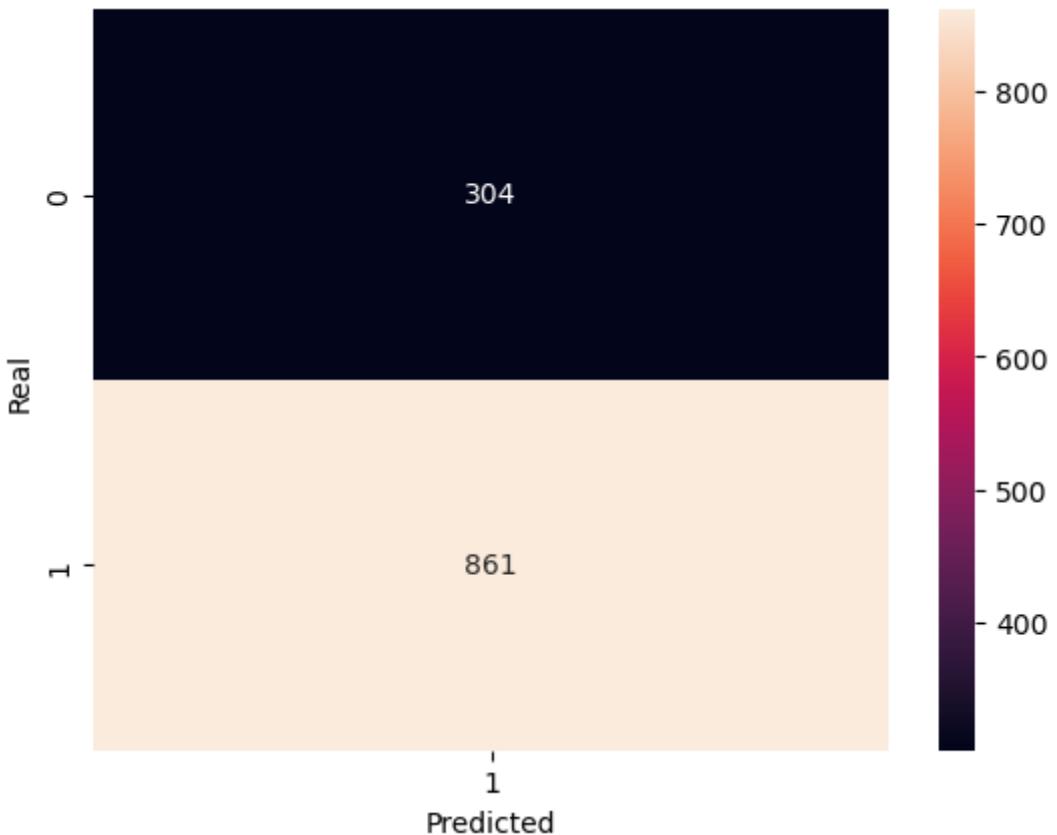
Data Stored Successfully  
Training with batch size: 32, epochs: 10, learning rate: 0.001, optimizer: SGD  
Current: 33/90  
Training [10%] Loss: 0.5839 Accuracy: 72.75%  
Training [20%] Loss: 0.5846 Accuracy: 72.92%  
Training [30%] Loss: 0.5835 Accuracy: 72.92%  
Training [40%] Loss: 0.5850 Accuracy: 72.92%  
Training [50%] Loss: 0.5839 Accuracy: 72.92%  
Training [60%] Loss: 0.5835 Accuracy: 72.92%  
Training [70%] Loss: 0.5846 Accuracy: 72.92%  
Training [80%] Loss: 0.5842 Accuracy: 72.92%  
Training [90%] Loss: 0.5842 Accuracy: 72.92%  
Training [100%] Loss: 0.5835 Accuracy: 72.92%  
Time taken: 189.32573461532593



Performance on test data:

Loss: 0.5751  
Accuracy: 73.91%





Time taken: 189.32573461532593

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

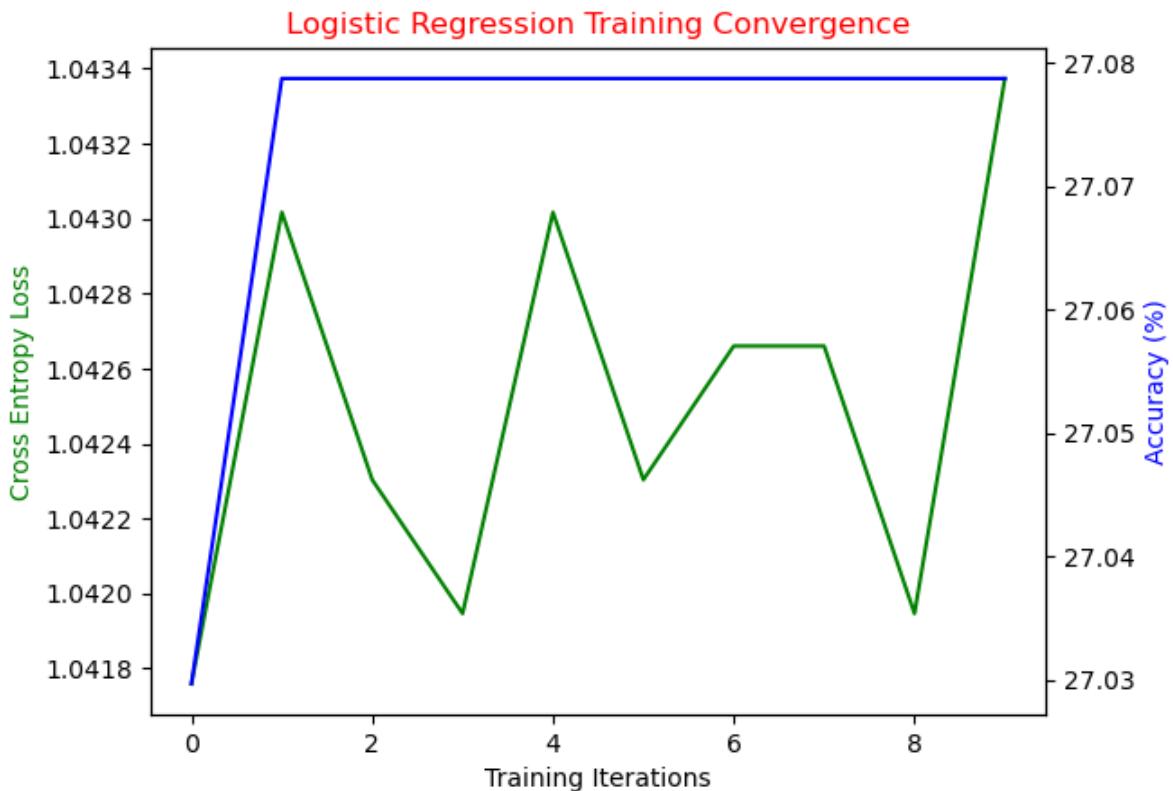
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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    _warn_prf(average, modifier, msg_start, len(result))
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

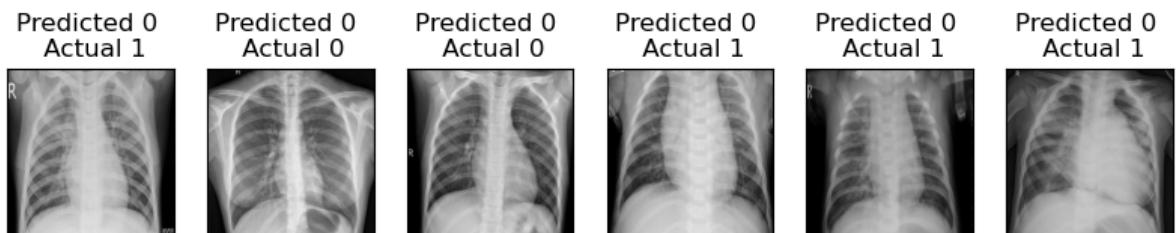
<b>Logistic Regression</b>				
<b>model_batch32_epochs10_lr0.001_optimizerSGD</b>	189.325735	0.739056	0.739056	1.0 0.849951

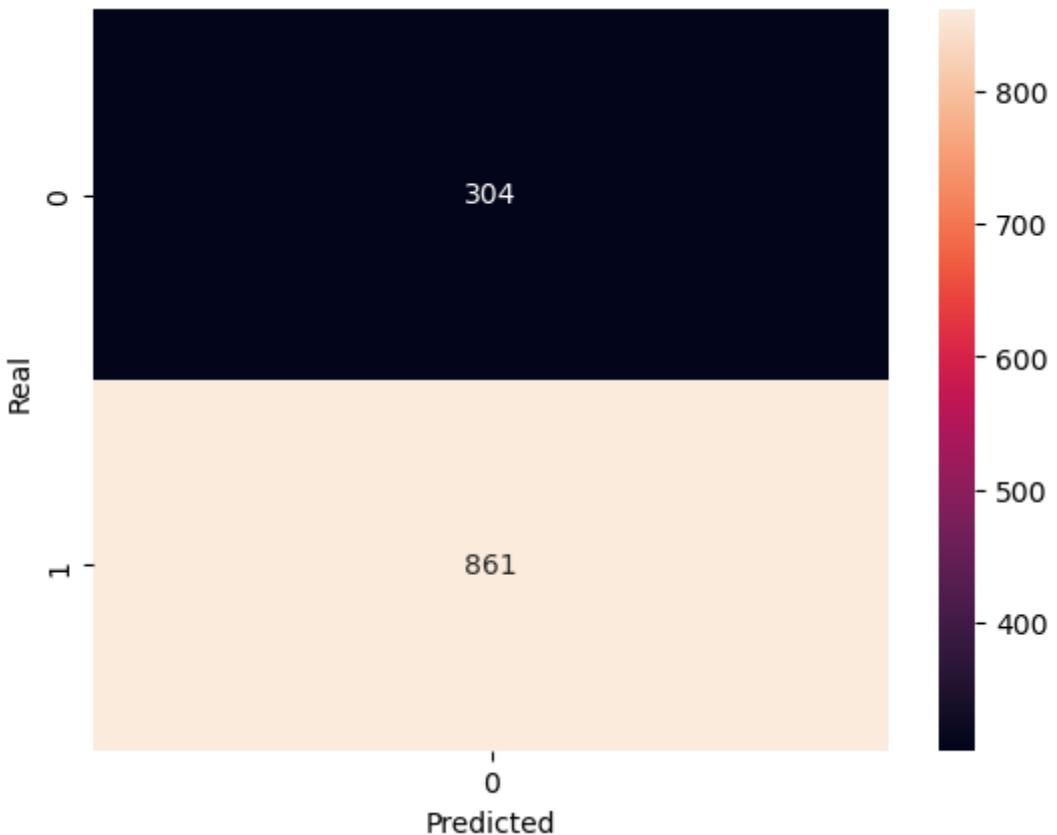
Data Stored Successfully  
 Training with batch size: 32, epochs: 10, learning rate: 0.001, optimizer: Adam  
 Current: 34/90  
 Training [10%] Loss: 1.0418 Accuracy: 27.03%  
 Training [20%] Loss: 1.0430 Accuracy: 27.08%  
 Training [30%] Loss: 1.0423 Accuracy: 27.08%  
 Training [40%] Loss: 1.0419 Accuracy: 27.08%  
 Training [50%] Loss: 1.0430 Accuracy: 27.08%  
 Training [60%] Loss: 1.0423 Accuracy: 27.08%  
 Training [70%] Loss: 1.0427 Accuracy: 27.08%  
 Training [80%] Loss: 1.0427 Accuracy: 27.08%  
 Training [90%] Loss: 1.0419 Accuracy: 27.08%  
 Training [100%] Loss: 1.0434 Accuracy: 27.08%  
 Time taken: 202.09978866577148



Performance on test data:

Loss: 1.0514  
 Accuracy: 26.09%



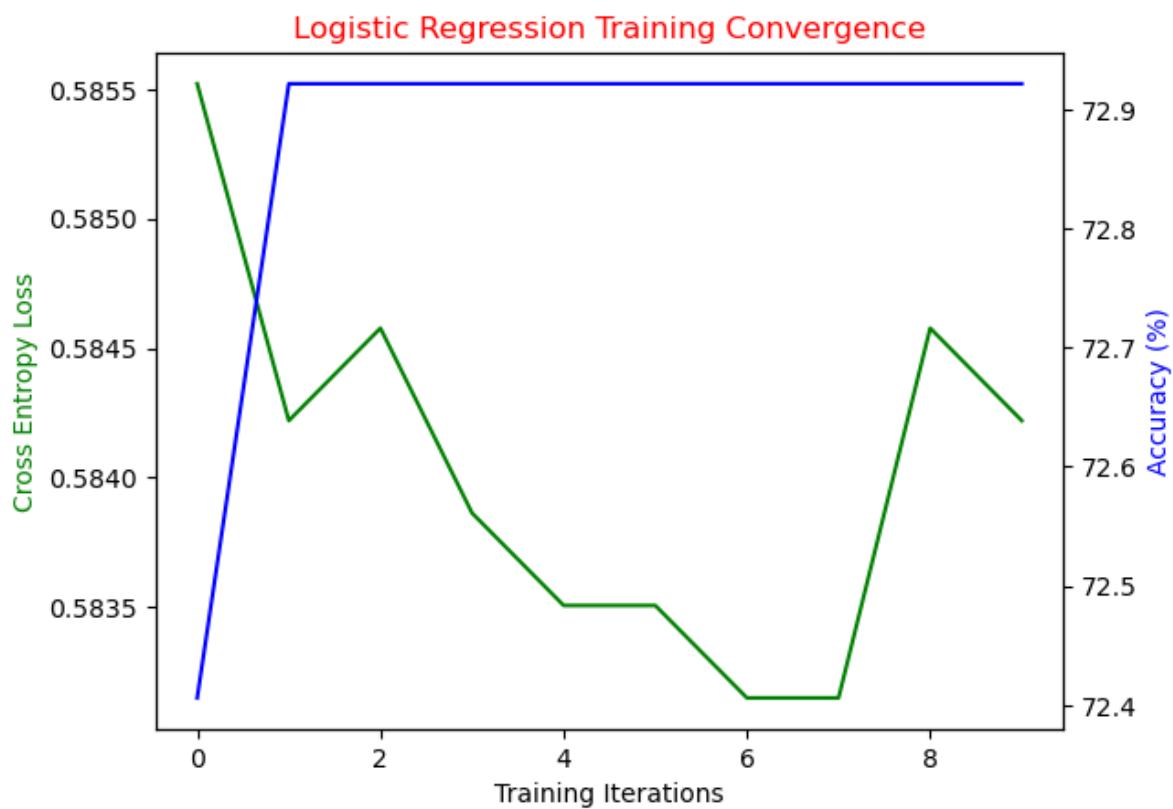


```
Time taken: 202.09978866577148
Test size: 1165
Total Accuracy: 0.2609442060085837
Total Precision: 0.0
Total Recall: 0.0
Total F1 Score: 0.0
Classification Report:
```

	precision	recall	f1-score	support
0	0.26	1.00	0.41	304
1	0.00	0.00	0.00	861
accuracy			0.26	1165
macro avg	0.13	0.50	0.21	1165
weighted avg	0.07	0.26	0.11	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 due to no
predicted samples. Use `zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
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this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs10_lr0.001_optimizerAdam</b>	202.099789	0.260944	0.0	0.0	0.0
Data Stored Successfully					
Training with batch size: 32, epochs: 10, learning rate: 0.01, optimizer: SGD					
Current: 35/90					
Training [10%]	Loss: 0.5855	Accuracy: 72.41%			
Training [20%]	Loss: 0.5842	Accuracy: 72.92%			
Training [30%]	Loss: 0.5846	Accuracy: 72.92%			
Training [40%]	Loss: 0.5839	Accuracy: 72.92%			
Training [50%]	Loss: 0.5835	Accuracy: 72.92%			
Training [60%]	Loss: 0.5835	Accuracy: 72.92%			
Training [70%]	Loss: 0.5831	Accuracy: 72.92%			
Training [80%]	Loss: 0.5831	Accuracy: 72.92%			
Training [90%]	Loss: 0.5846	Accuracy: 72.92%			
Training [100%]	Loss: 0.5842	Accuracy: 72.92%			
Time taken: 189.96638703346252					



### Performance on test data:

Loss: 0.5752

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

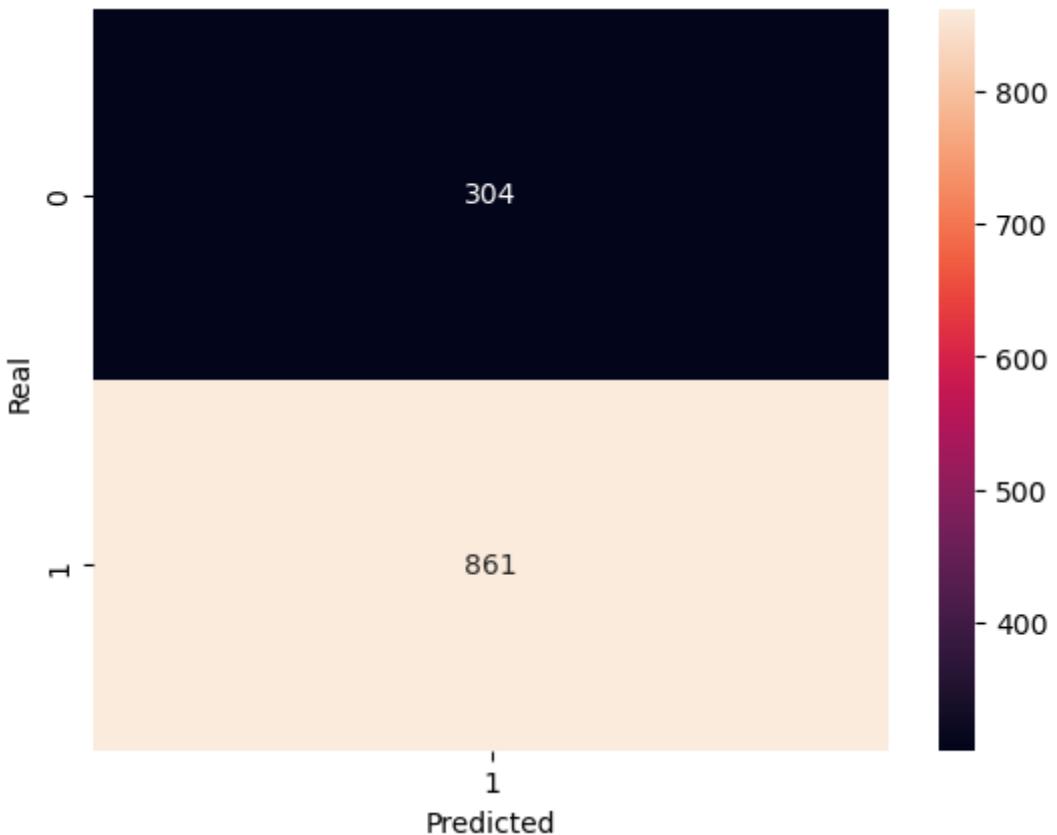


Predicted 1  
Actual 1



Predicted 1  
Actual 0





Time taken: 189.96638703346252

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

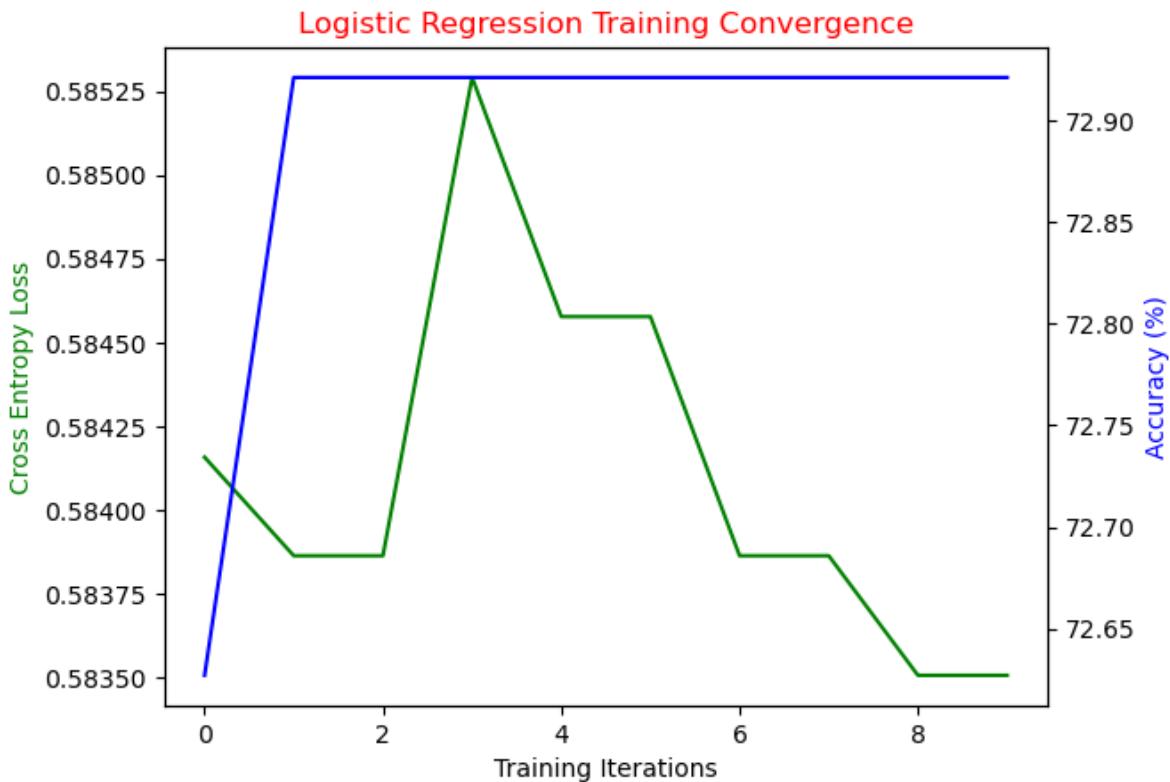
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch32_epochs10_lr0.01_optimizerSGD	189.966387	0.739056	0.739056	1.0	0.849951
---	------------	----------	----------	-----	----------

```
Data Stored Successfully
Training with batch size: 32, epochs: 10, learning rate: 0.01, optimizer: Adam
Current: 36/90
Training [10%] Loss: 0.5842 Accuracy: 72.63%
Training [20%] Loss: 0.5839 Accuracy: 72.92%
Training [30%] Loss: 0.5839 Accuracy: 72.92%
Training [40%] Loss: 0.5853 Accuracy: 72.92%
Training [50%] Loss: 0.5846 Accuracy: 72.92%
Training [60%] Loss: 0.5846 Accuracy: 72.92%
Training [70%] Loss: 0.5839 Accuracy: 72.92%
Training [80%] Loss: 0.5839 Accuracy: 72.92%
Training [90%] Loss: 0.5835 Accuracy: 72.92%
Training [100%] Loss: 0.5835 Accuracy: 72.92%
Time taken: 200.52976965904236
```



### Performance on test data:

Loss: 0.5751

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

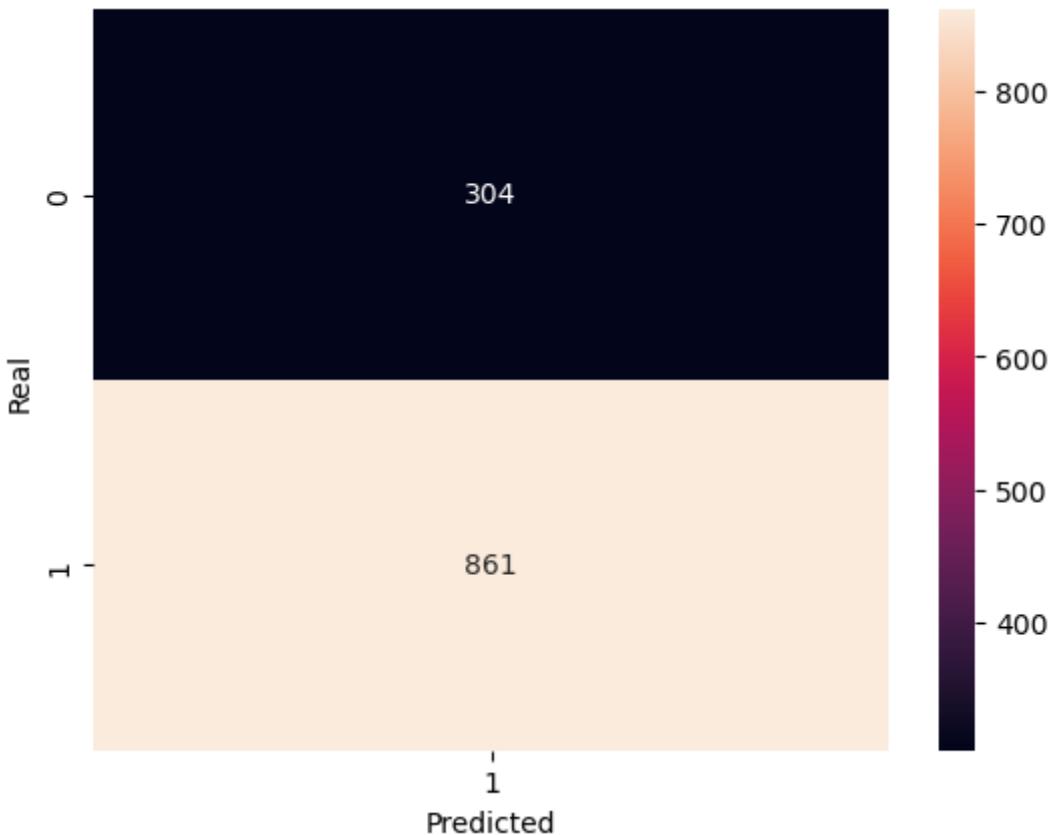


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 200.52976965904236

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

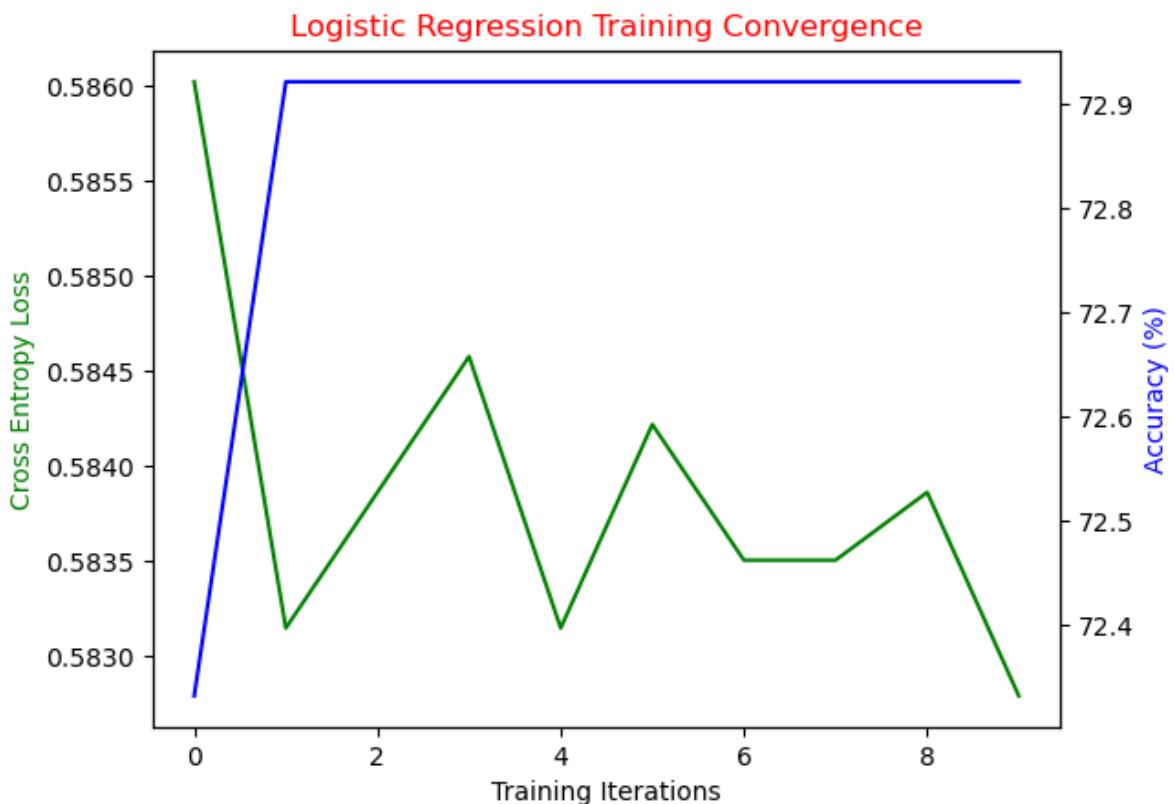
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

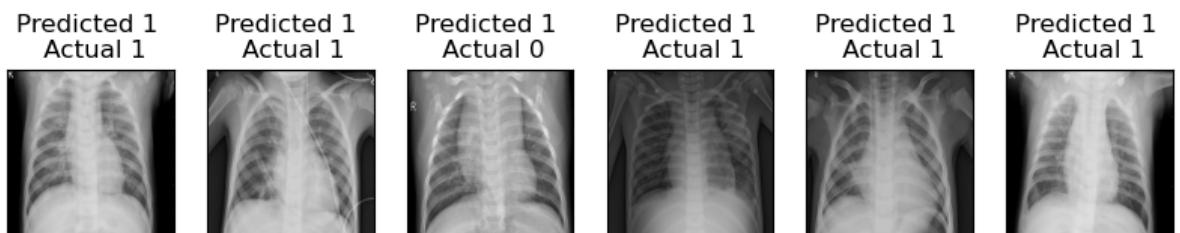
<b>Logistic Regression</b>				
model_batch32_epochs10_lr0.01_optimizerAdam	200.52977	0.739056	0.739056	1.0 0.849951

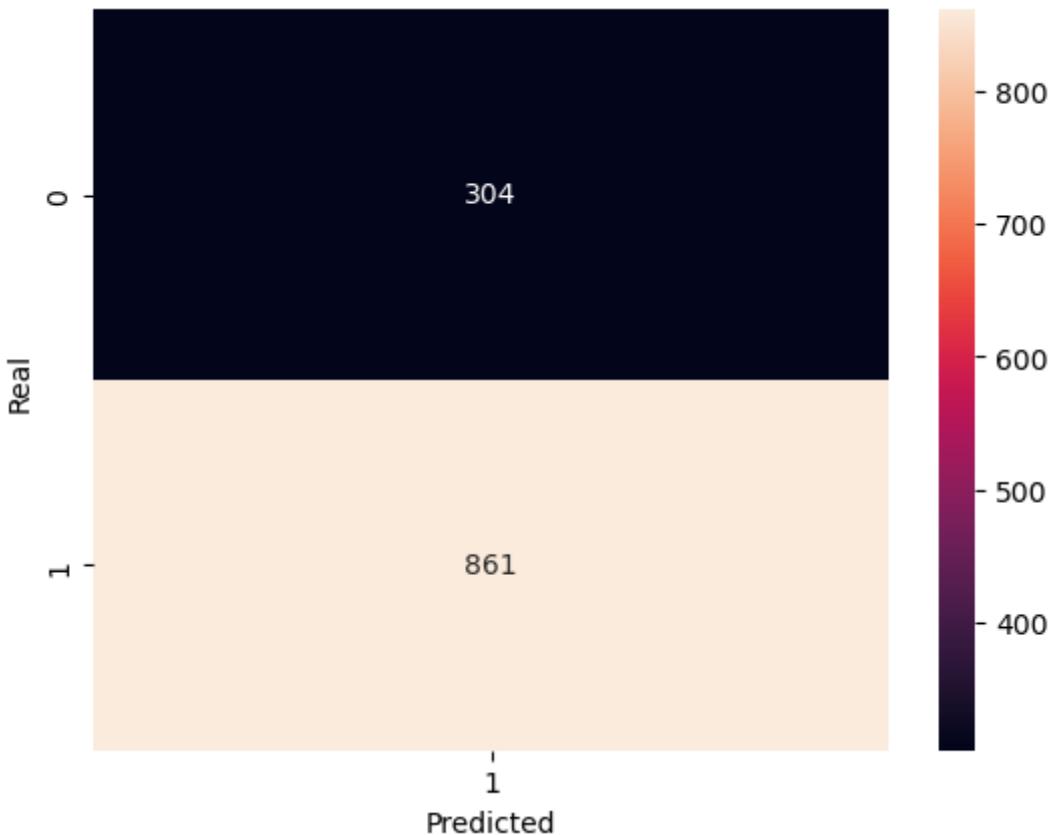
Data Stored Successfully  
Training with batch size: 32, epochs: 10, learning rate: 0.1, optimizer: SGD  
Current: 37/90  
Training [10%] Loss: 0.5860 Accuracy: 72.33%  
Training [20%] Loss: 0.5831 Accuracy: 72.92%  
Training [30%] Loss: 0.5839 Accuracy: 72.92%  
Training [40%] Loss: 0.5846 Accuracy: 72.92%  
Training [50%] Loss: 0.5831 Accuracy: 72.92%  
Training [60%] Loss: 0.5842 Accuracy: 72.92%  
Training [70%] Loss: 0.5835 Accuracy: 72.92%  
Training [80%] Loss: 0.5835 Accuracy: 72.92%  
Training [90%] Loss: 0.5839 Accuracy: 72.92%  
Training [100%] Loss: 0.5828 Accuracy: 72.92%  
Time taken: 189.1295518875122



Performance on test data:

Loss: 0.5751  
Accuracy: 73.91%





Time taken: 189.1295518875122

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

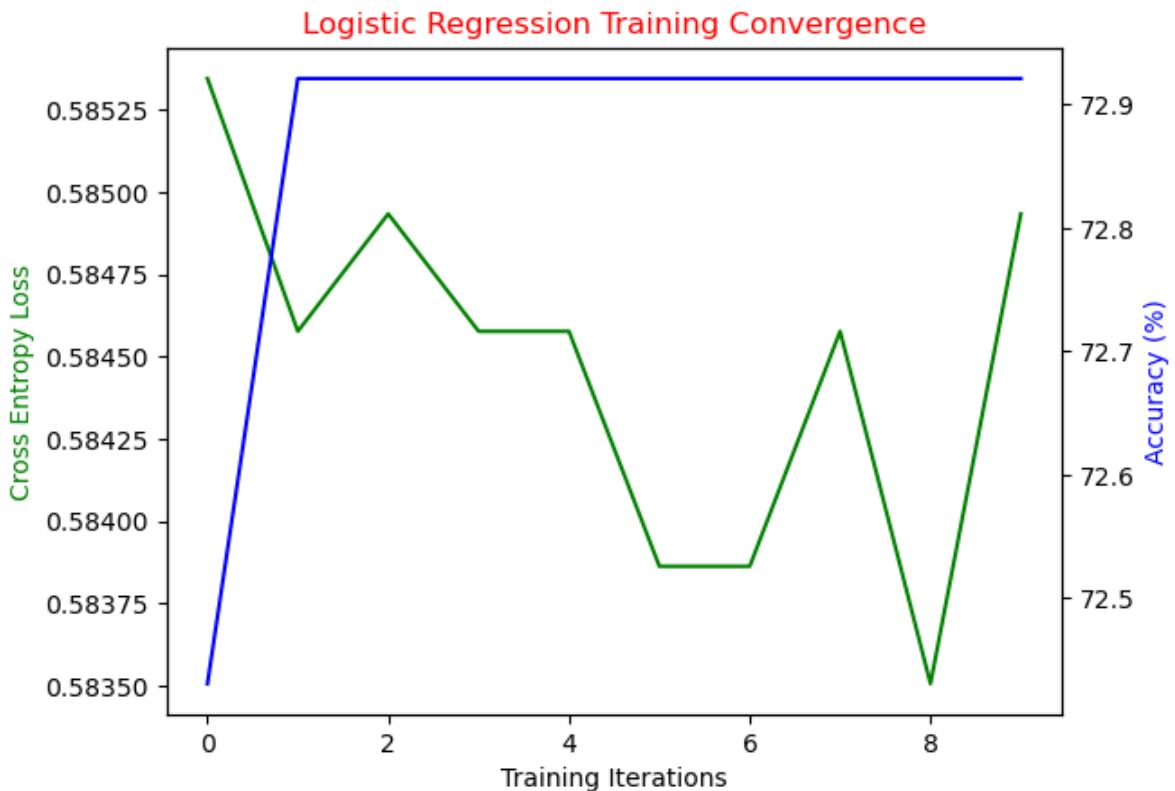
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

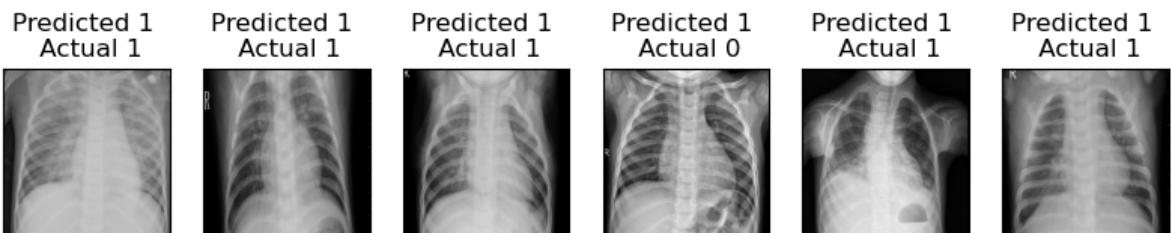
Logistic Regression model_batch32_epochs10_lr0.1_optimizerSGD	189.129552	0.739056	0.739056	1.0	0.849951
--	------------	----------	----------	-----	----------

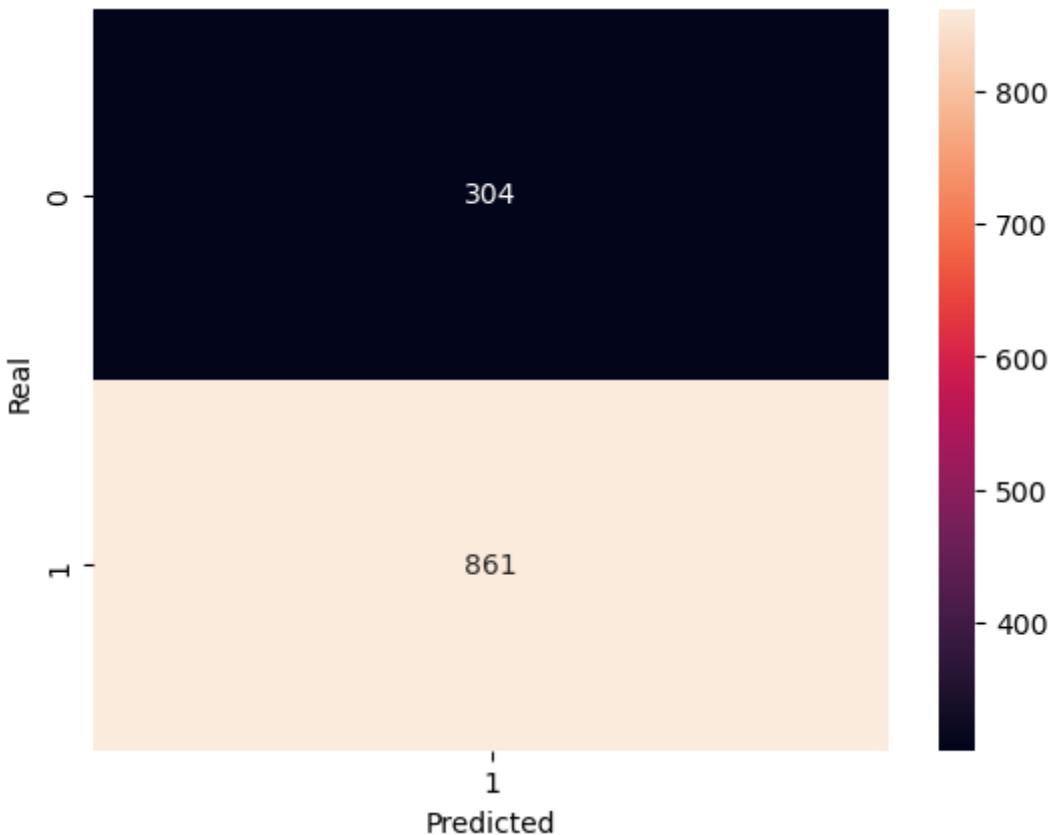
Data Stored Successfully  
Training with batch size: 32, epochs: 10, learning rate: 0.1, optimizer: Adam  
Current: 38/90  
Training [10%] Loss: 0.5853 Accuracy: 72.43%  
Training [20%] Loss: 0.5846 Accuracy: 72.92%  
Training [30%] Loss: 0.5849 Accuracy: 72.92%  
Training [40%] Loss: 0.5846 Accuracy: 72.92%  
Training [50%] Loss: 0.5846 Accuracy: 72.92%  
Training [60%] Loss: 0.5839 Accuracy: 72.92%  
Training [70%] Loss: 0.5839 Accuracy: 72.92%  
Training [80%] Loss: 0.5846 Accuracy: 72.92%  
Training [90%] Loss: 0.5835 Accuracy: 72.92%  
Training [100%] Loss: 0.5849 Accuracy: 72.92%  
Time taken: 201.74094033241272



Performance on test data:

Loss: 0.5753  
Accuracy: 73.91%





Time taken: 201.74094033241272

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
```

```
_warn_prf(average, modifier, msg_start, len(result))
```

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
```

```
_warn_prf(average, modifier, msg_start, len(result))
```

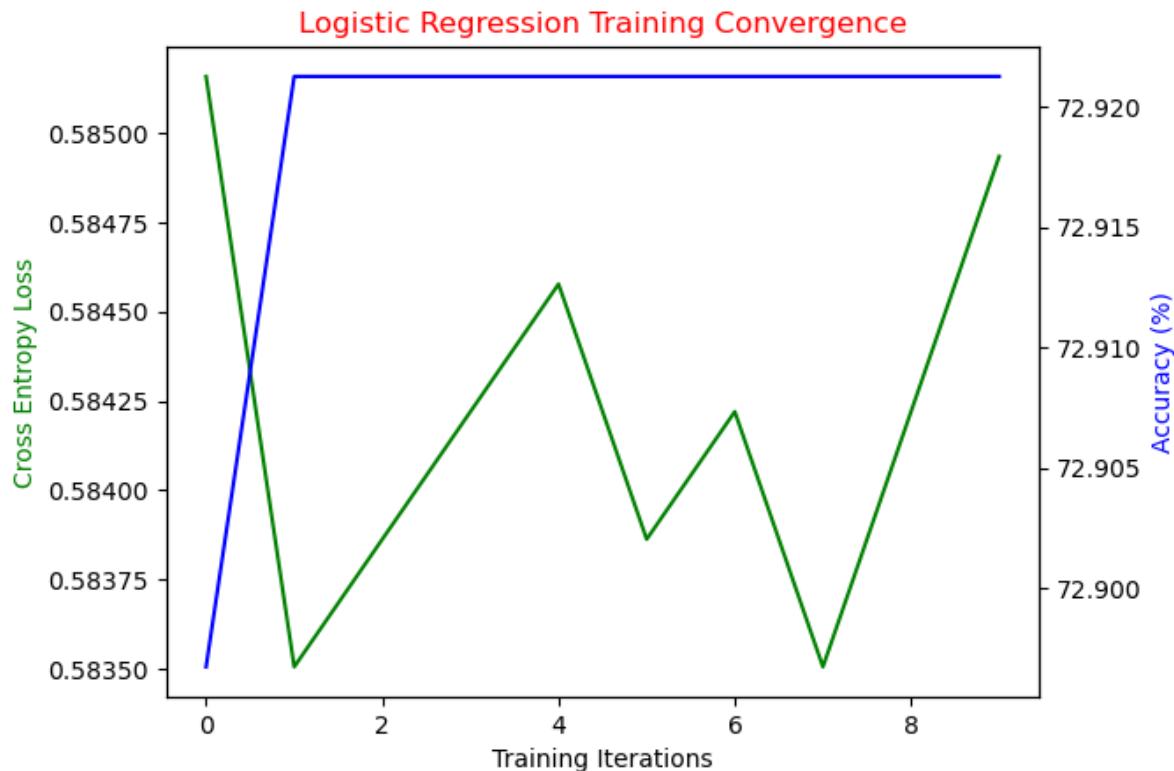
```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
```

```
_warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch32_epochs10_lr0.1_optimizerAdam	201.74094	0.739056	0.739056	1.0	0.849951
---	-----------	----------	----------	-----	----------

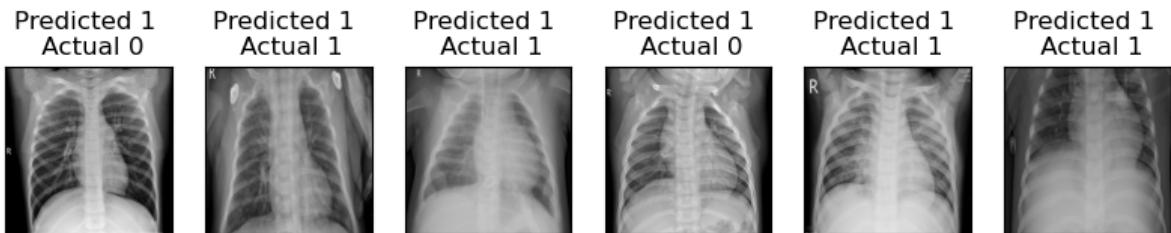
Data Stored Successfully  
Training with batch size: 32, epochs: 10, learning rate: 1, optimizer: SGD  
Current: 39/90  
Training [10%] Loss: 0.5852 Accuracy: 72.90%  
Training [20%] Loss: 0.5835 Accuracy: 72.92%  
Training [30%] Loss: 0.5839 Accuracy: 72.92%  
Training [40%] Loss: 0.5842 Accuracy: 72.92%  
Training [50%] Loss: 0.5846 Accuracy: 72.92%  
Training [60%] Loss: 0.5839 Accuracy: 72.92%  
Training [70%] Loss: 0.5842 Accuracy: 72.92%  
Training [80%] Loss: 0.5835 Accuracy: 72.92%  
Training [90%] Loss: 0.5842 Accuracy: 72.92%  
Training [100%] Loss: 0.5849 Accuracy: 72.92%  
Time taken: 190.5561785697937

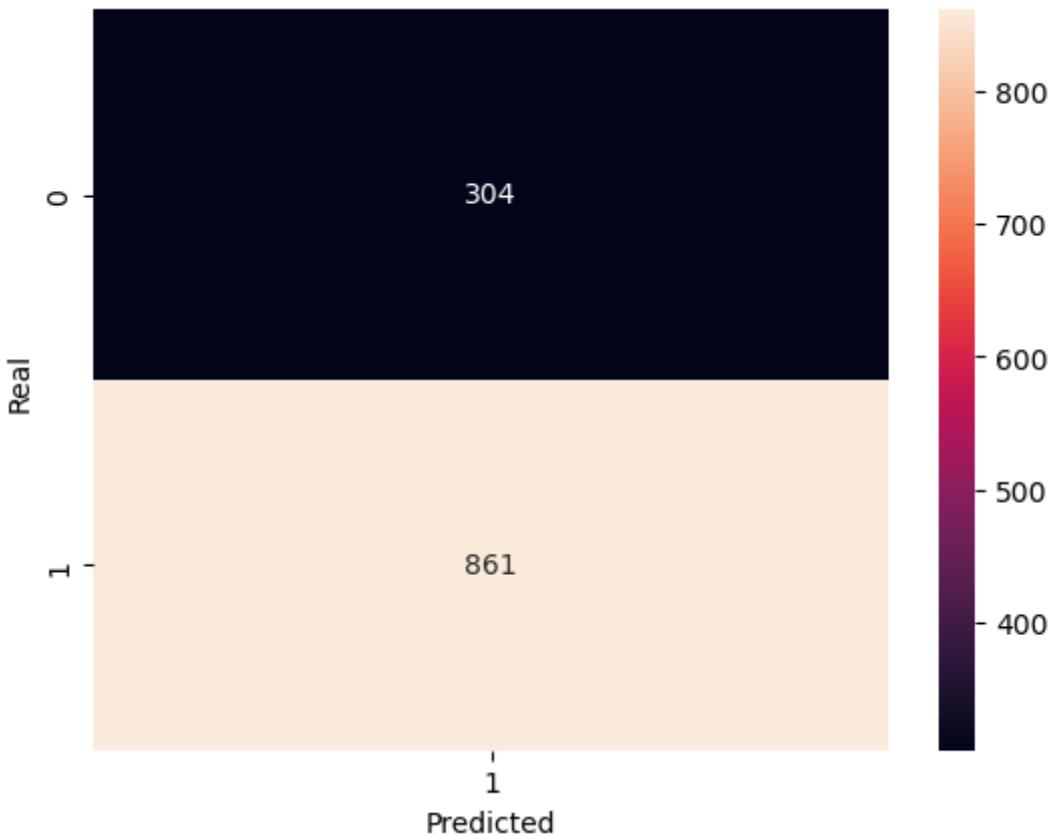


Performance on test data:

Loss: 0.5753

Accuracy: 73.91%





Time taken: 190.5561785697937

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

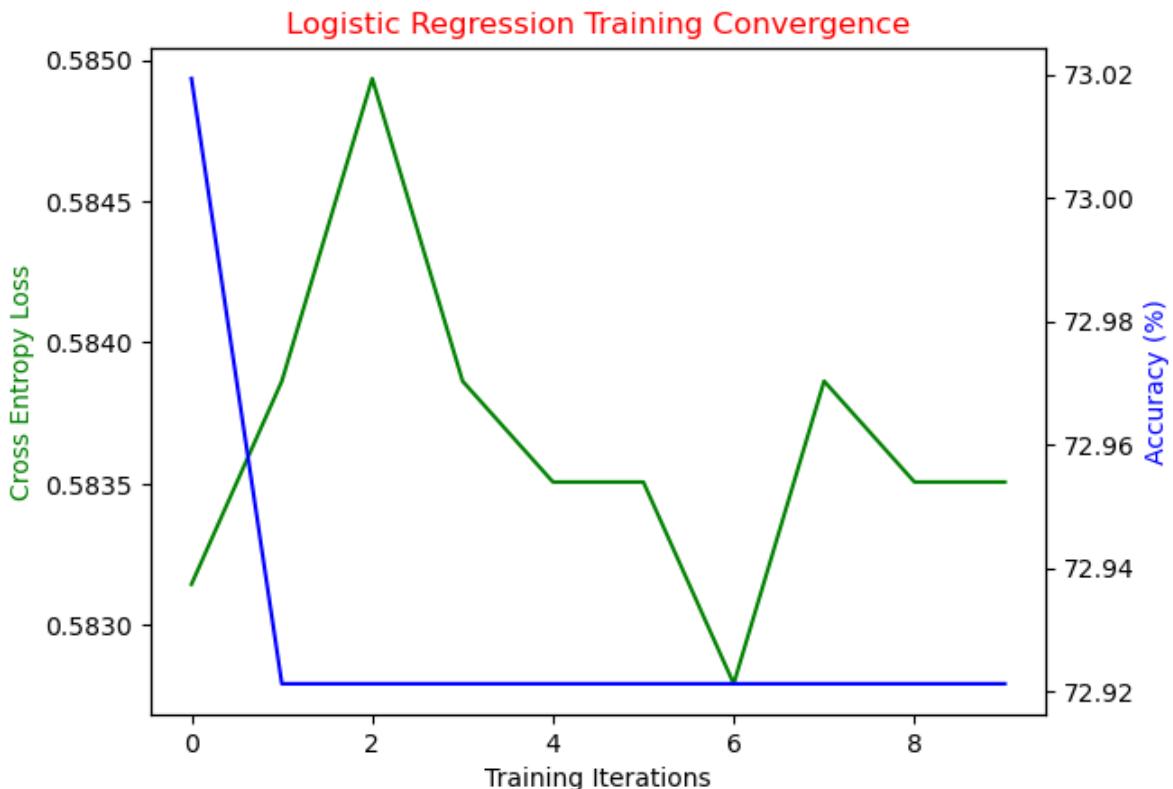
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time Accuracy Precision Recall F1 score

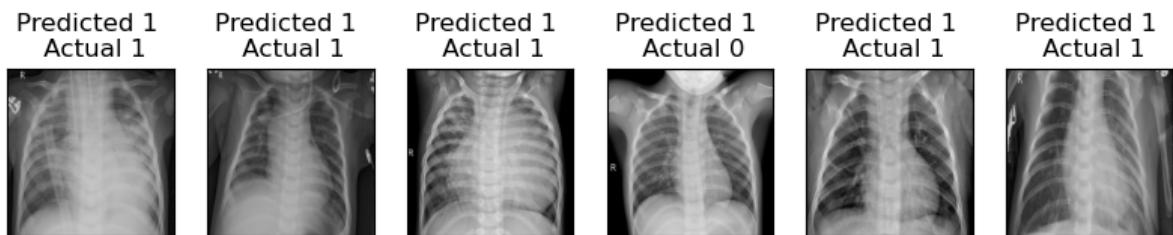
Logistic Regression	Time	Accuracy	Precision	Recall	F1 score
model_batch32_epochs10_lr1_optimizerSGD	190.556179	0.739056	0.739056	1.0	0.849951

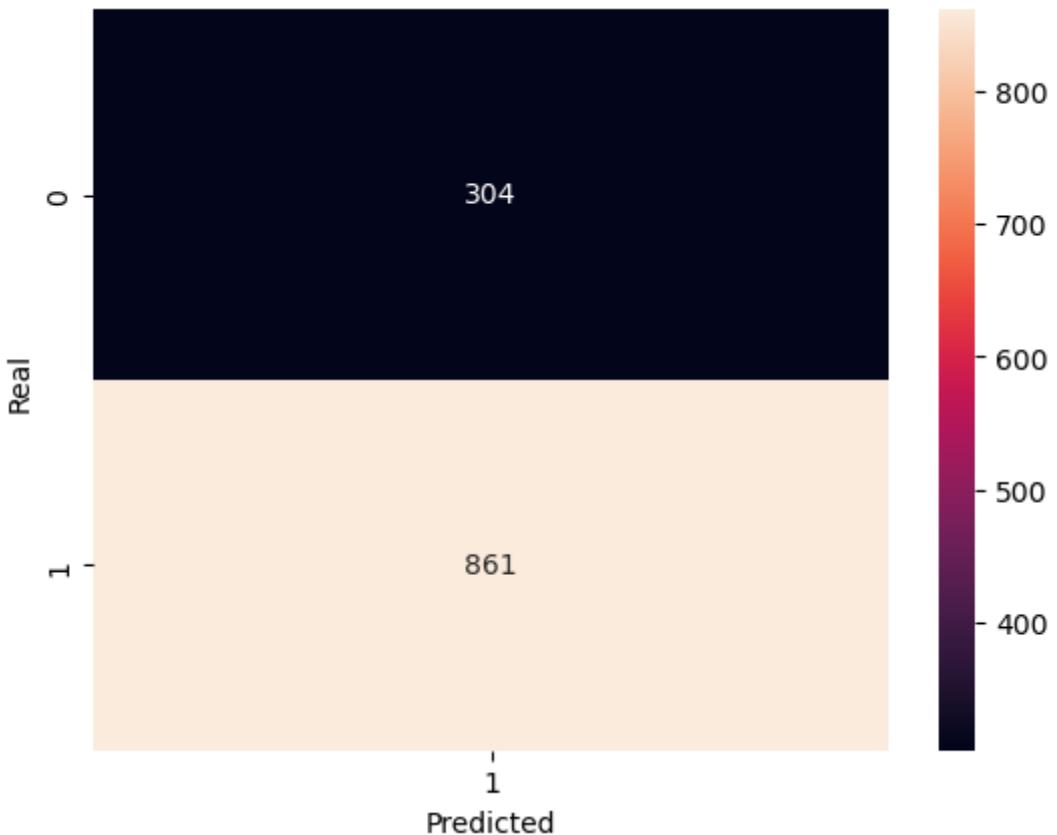
Data Stored Successfully  
Training with batch size: 32, epochs: 10, learning rate: 1, optimizer: Adam  
Current: 40/90  
Training [10%] Loss: 0.5831 Accuracy: 73.02%  
Training [20%] Loss: 0.5839 Accuracy: 72.92%  
Training [30%] Loss: 0.5849 Accuracy: 72.92%  
Training [40%] Loss: 0.5839 Accuracy: 72.92%  
Training [50%] Loss: 0.5835 Accuracy: 72.92%  
Training [60%] Loss: 0.5835 Accuracy: 72.92%  
Training [70%] Loss: 0.5828 Accuracy: 72.92%  
Training [80%] Loss: 0.5839 Accuracy: 72.92%  
Training [90%] Loss: 0.5835 Accuracy: 72.92%  
Training [100%] Loss: 0.5835 Accuracy: 72.92%  
Time taken: 201.5389883518219



Performance on test data:

Loss: 0.5751  
Accuracy: 73.91%





Time taken: 201.5389883518219

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch32_epochs10_lr1_optimizerAdam	201.538988	0.739056	0.739056	1.0	0.849951
---	------------	----------	----------	-----	----------

Data Stored Successfully

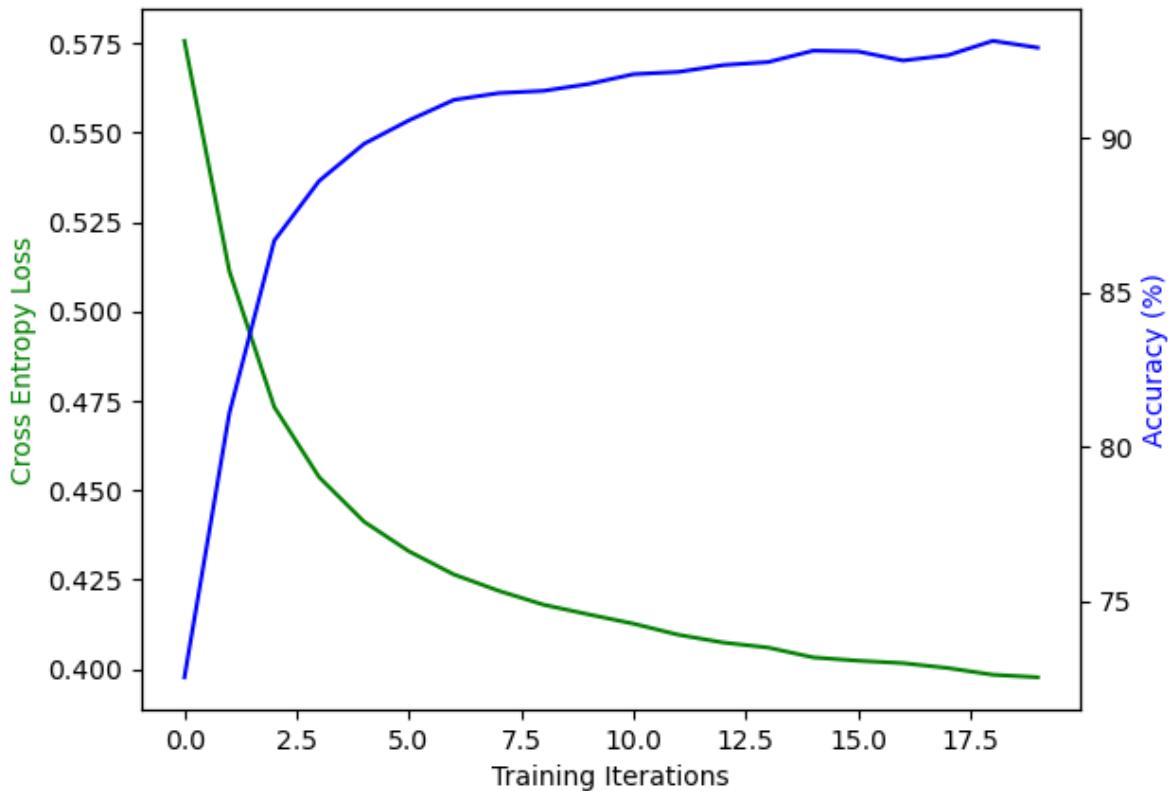
Training with batch size: 32, epochs: 20, learning rate: 0.0001, optimizer: SGD

Current: 41/90

Training [5%]	Loss: 0.5756	Accuracy: 72.53%
Training [10%]	Loss: 0.5113	Accuracy: 81.09%
Training [15%]	Loss: 0.4733	Accuracy: 86.68%
Training [20%]	Loss: 0.4537	Accuracy: 88.62%
Training [25%]	Loss: 0.4412	Accuracy: 89.82%
Training [30%]	Loss: 0.4330	Accuracy: 90.58%
Training [35%]	Loss: 0.4265	Accuracy: 91.24%
Training [40%]	Loss: 0.4219	Accuracy: 91.46%
Training [45%]	Loss: 0.4180	Accuracy: 91.54%
Training [50%]	Loss: 0.4153	Accuracy: 91.76%
Training [55%]	Loss: 0.4127	Accuracy: 92.08%
Training [60%]	Loss: 0.4096	Accuracy: 92.15%
Training [65%]	Loss: 0.4075	Accuracy: 92.37%
Training [70%]	Loss: 0.4061	Accuracy: 92.47%
Training [75%]	Loss: 0.4033	Accuracy: 92.84%
Training [80%]	Loss: 0.4024	Accuracy: 92.81%
Training [85%]	Loss: 0.4017	Accuracy: 92.52%
Training [90%]	Loss: 0.4003	Accuracy: 92.69%
Training [95%]	Loss: 0.3985	Accuracy: 93.16%
Training [100%]	Loss: 0.3978	Accuracy: 92.94%

Time taken: 378.21263670921326

### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.3935

Accuracy: 93.73%

Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

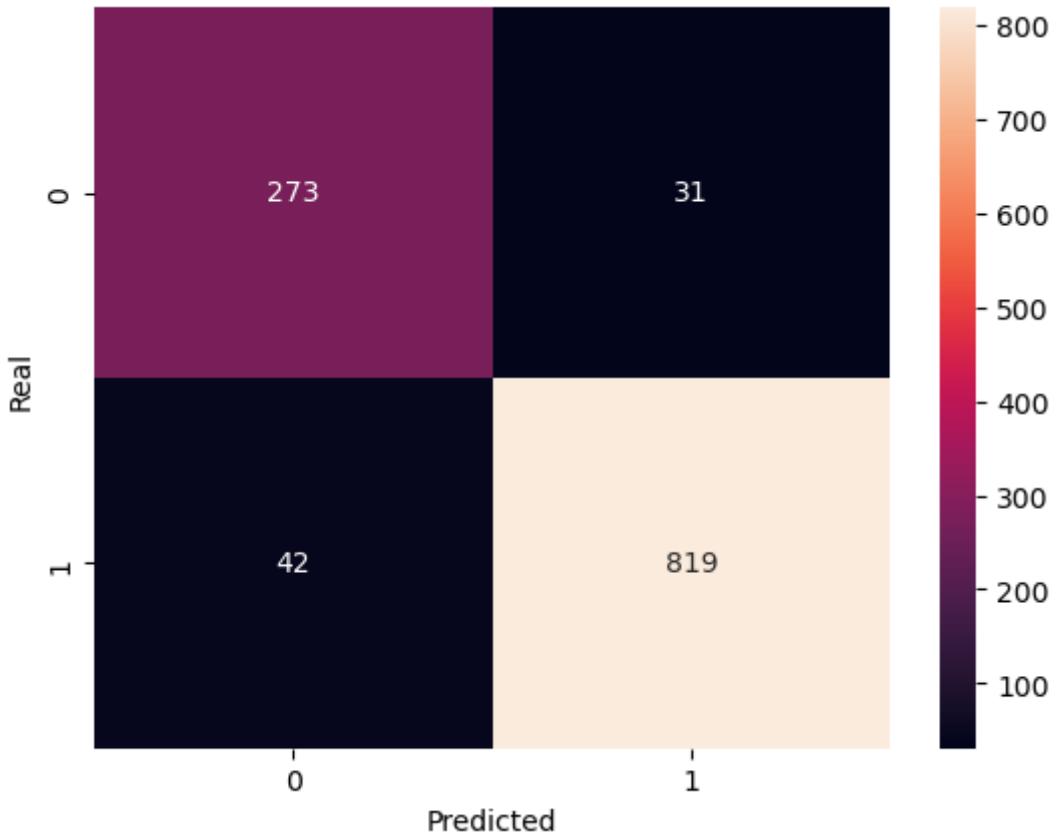


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 378.21263670921326

Test size: 1165

Total Accuracy: 0.9373390557939915

Total Precision: 0.9635294117647059

Total Recall: 0.9512195121951219

Total F1 Score: 0.9573348918760959

Classification Report:

	precision	recall	f1-score	support
0	0.87	0.90	0.88	304
1	0.96	0.95	0.96	861
accuracy			0.94	1165
macro avg	0.92	0.92	0.92	1165
weighted avg	0.94	0.94	0.94	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch32_epochs20_lr0.0001_optimizerSGD</b>	378.212637	0.937339	0.963529	0.95122	0.957335

Data Stored Successfully  
 Training with batch size: 32, epochs: 20, learning rate: 0.0001, optimizer: Adam  
 Current: 42/90

Training [5%]	Loss: 0.5851	Accuracy: 72.92%
Training [10%]	Loss: 0.5846	Accuracy: 72.92%
Training [15%]	Loss: 0.5842	Accuracy: 72.92%
Training [20%]	Loss: 0.5842	Accuracy: 72.92%
Training [25%]	Loss: 0.5846	Accuracy: 72.92%
Training [30%]	Loss: 0.5849	Accuracy: 72.92%
Training [35%]	Loss: 0.5846	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [45%]	Loss: 0.5842	Accuracy: 72.92%
Training [50%]	Loss: 0.5839	Accuracy: 72.92%
Training [55%]	Loss: 0.5839	Accuracy: 72.92%
Training [60%]	Loss: 0.5831	Accuracy: 72.92%
Training [65%]	Loss: 0.5839	Accuracy: 72.92%
Training [70%]	Loss: 0.5849	Accuracy: 72.92%
Training [75%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [85%]	Loss: 0.5846	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [95%]	Loss: 0.5831	Accuracy: 72.92%
Training [100%]	Loss: 0.5842	Accuracy: 72.92%

Time taken: 412.4959604740143



Performance on test data:

Loss: 0.5752  
 Accuracy: 73.91%

Predicted 1  
 Actual 1



Predicted 1  
 Actual 1



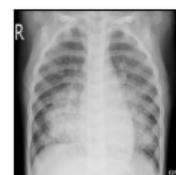
Predicted 1  
 Actual 1



Predicted 1  
 Actual 1

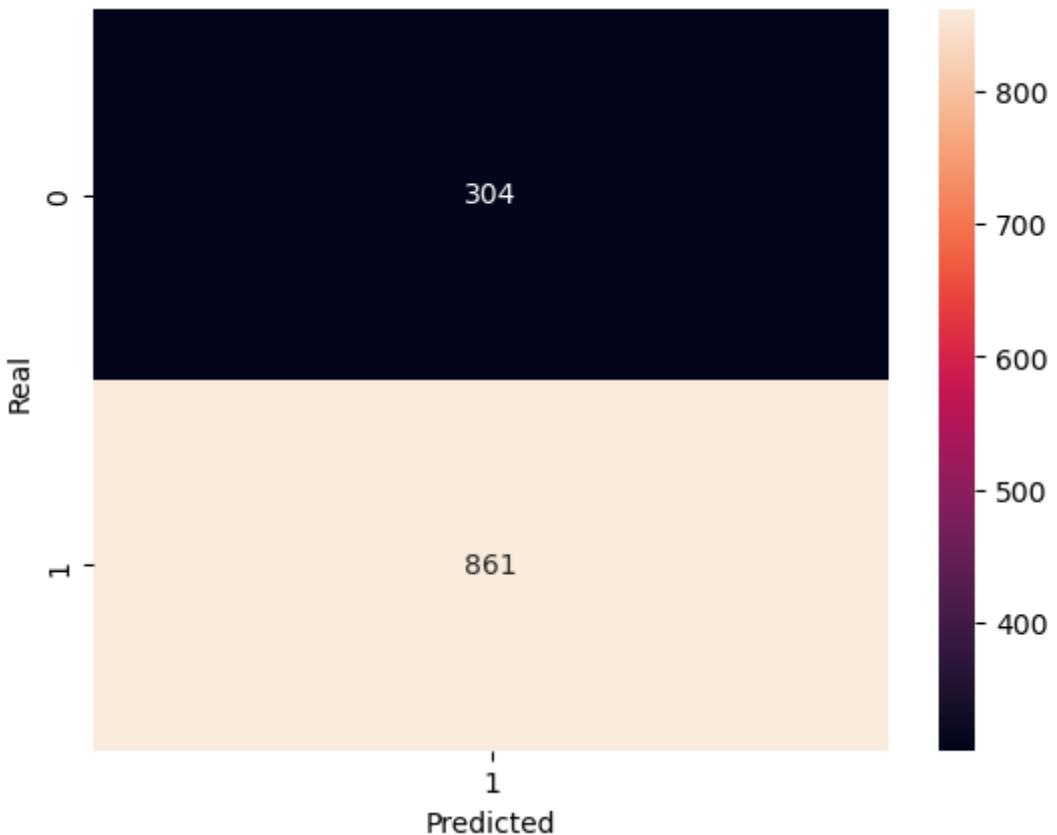


Predicted 1  
 Actual 1



Predicted 1  
 Actual 0





Time taken: 412.4959604740143

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch32_epochs20_lr0.0001_optimizerAdam	412.49596	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

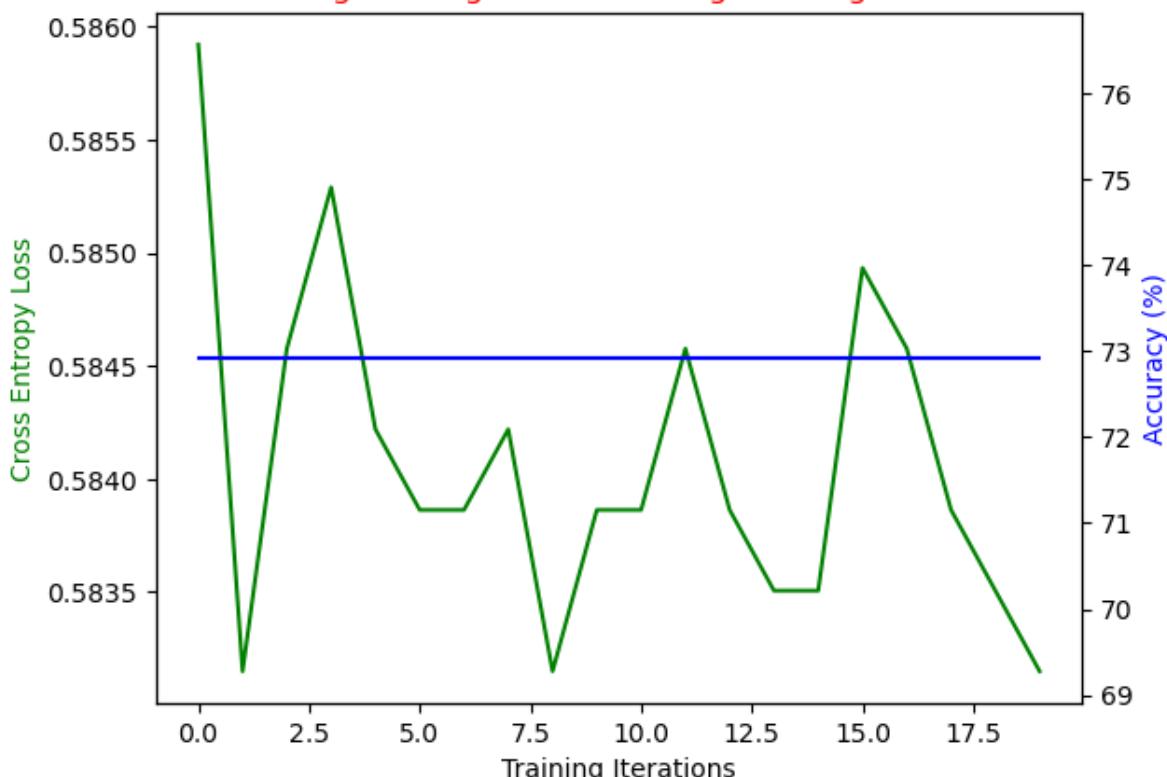
Training with batch size: 32, epochs: 20, learning rate: 0.001, optimizer: SGD

Current: 43/90

Training [5%]	Loss: 0.5859	Accuracy: 72.92%
Training [10%]	Loss: 0.5831	Accuracy: 72.92%
Training [15%]	Loss: 0.5846	Accuracy: 72.92%
Training [20%]	Loss: 0.5853	Accuracy: 72.92%
Training [25%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5839	Accuracy: 72.92%
Training [35%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [45%]	Loss: 0.5831	Accuracy: 72.92%
Training [50%]	Loss: 0.5839	Accuracy: 72.92%
Training [55%]	Loss: 0.5839	Accuracy: 72.92%
Training [60%]	Loss: 0.5846	Accuracy: 72.92%
Training [65%]	Loss: 0.5839	Accuracy: 72.92%
Training [70%]	Loss: 0.5835	Accuracy: 72.92%
Training [75%]	Loss: 0.5835	Accuracy: 72.92%
Training [80%]	Loss: 0.5849	Accuracy: 72.92%
Training [85%]	Loss: 0.5846	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [95%]	Loss: 0.5835	Accuracy: 72.92%
Training [100%]	Loss: 0.5831	Accuracy: 72.92%

Time taken: 379.46731305122375

Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5751

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 0



Predicted 1  
Actual 0



Predicted 1  
Actual 0

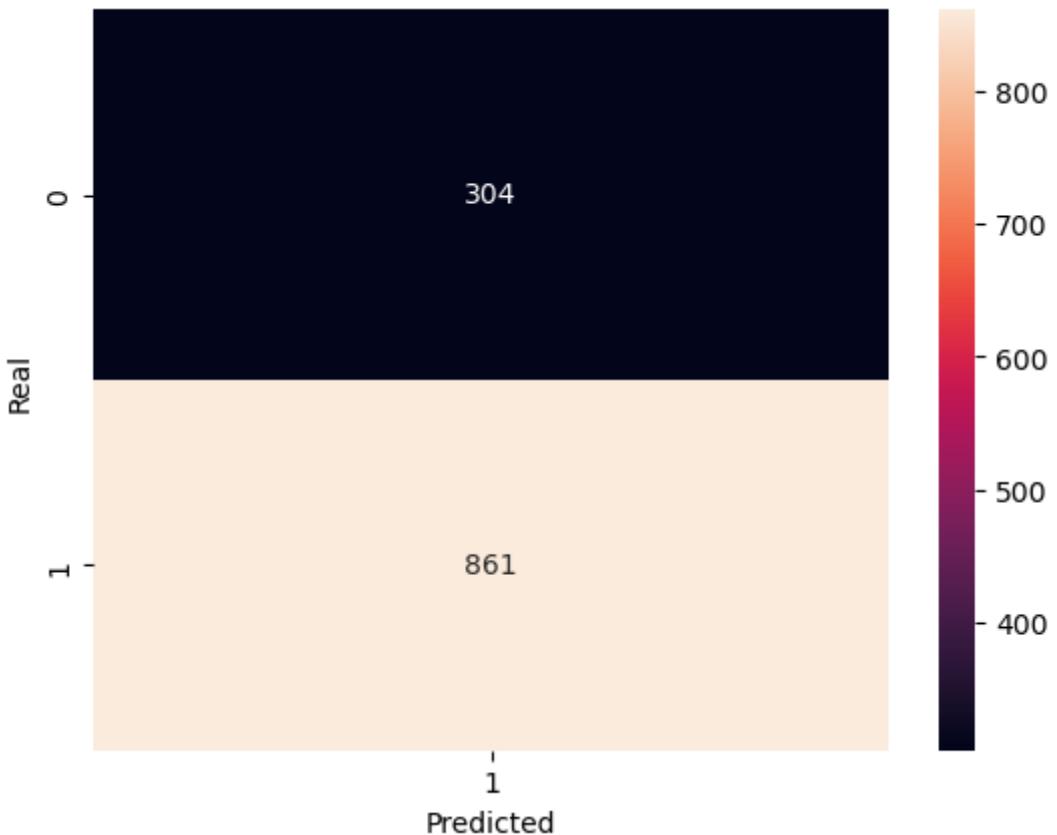


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 379.46731305122375

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

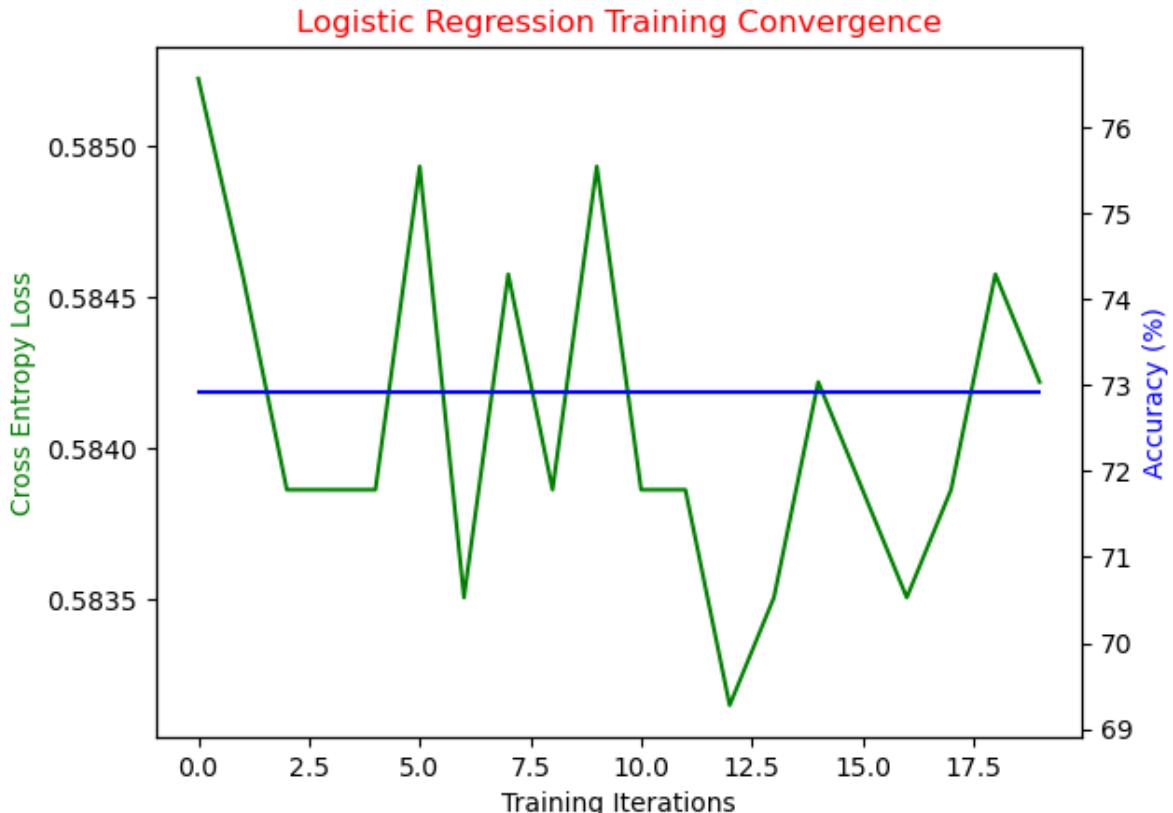
Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

<b>Logistic Regression</b>					
<b>model_batch32_epochs20_lr0.001_optimizerSGD</b>	379.467313	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
 Training with batch size: 32, epochs: 20, learning rate: 0.001, optimizer: Adam  
 Current: 44/90

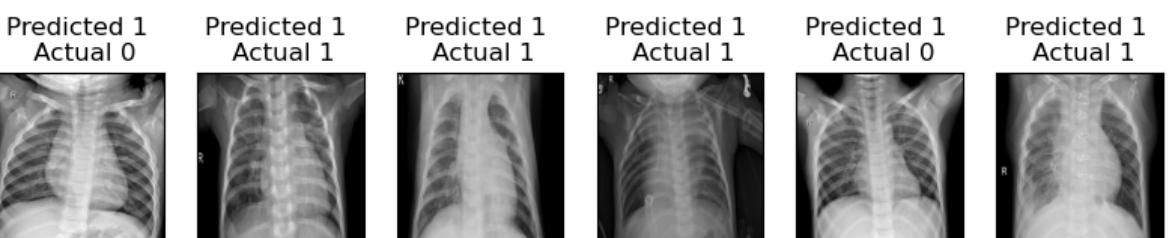
Training [5%]	Loss: 0.5852	Accuracy: 72.92%
Training [10%]	Loss: 0.5846	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5839	Accuracy: 72.92%
Training [25%]	Loss: 0.5839	Accuracy: 72.92%
Training [30%]	Loss: 0.5849	Accuracy: 72.92%
Training [35%]	Loss: 0.5835	Accuracy: 72.92%
Training [40%]	Loss: 0.5846	Accuracy: 72.92%
Training [45%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5849	Accuracy: 72.92%
Training [55%]	Loss: 0.5839	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [65%]	Loss: 0.5831	Accuracy: 72.92%
Training [70%]	Loss: 0.5835	Accuracy: 72.92%
Training [75%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [85%]	Loss: 0.5835	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [95%]	Loss: 0.5846	Accuracy: 72.92%
Training [100%]	Loss: 0.5842	Accuracy: 72.92%

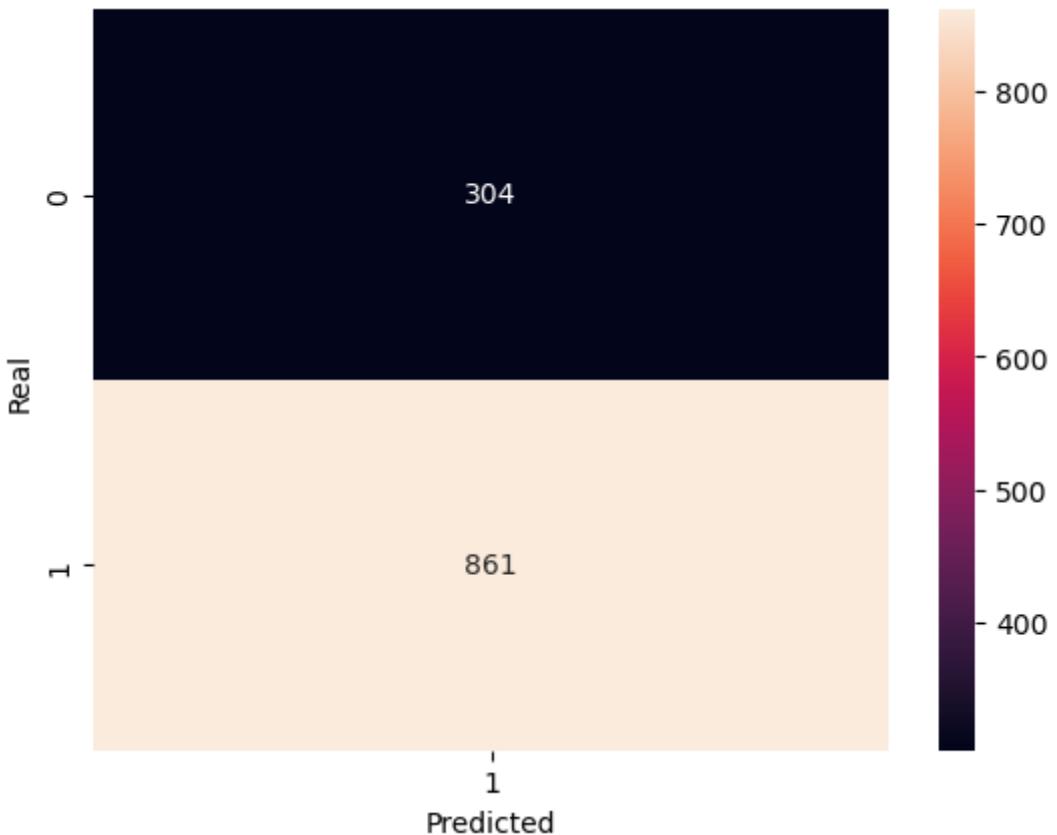
Time taken: 413.17325258255005



Performance on test data:

Loss: 0.5752  
 Accuracy: 73.91%





Time taken: 413.17325258255005

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

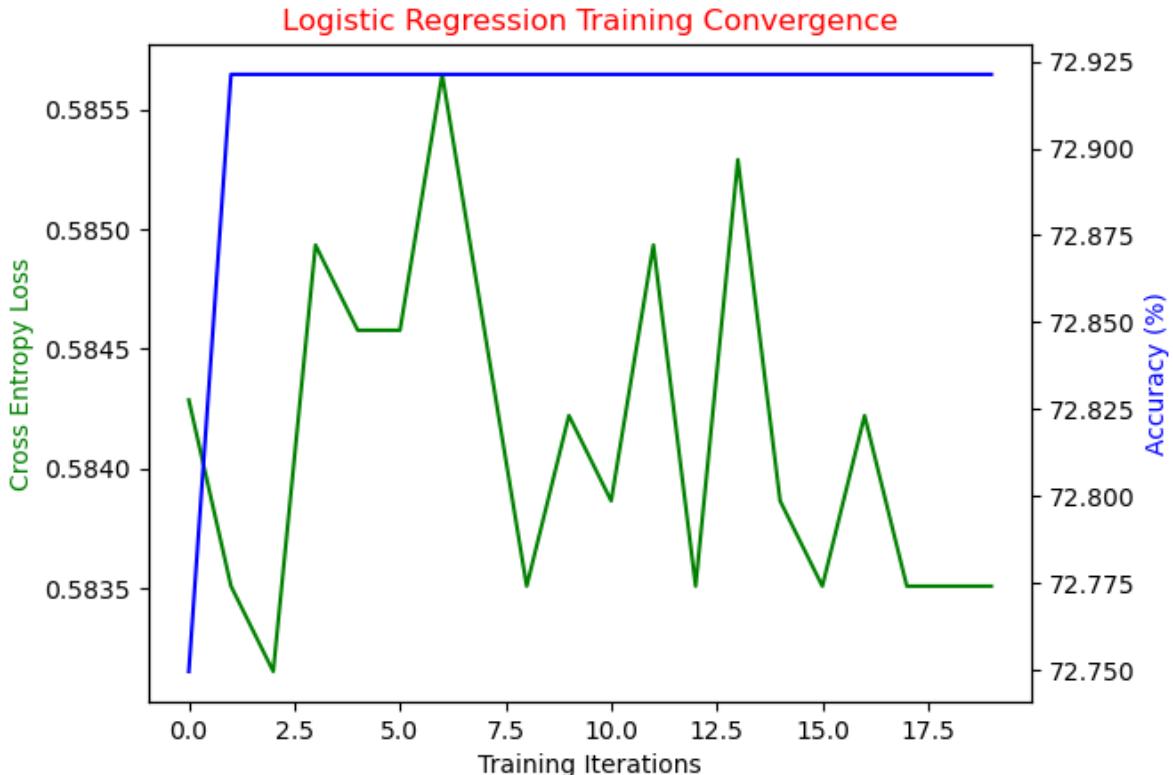
Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch32_epochs20_lr0.001_optimizerAdam</b>	413.173253	0.739056	0.739056	1.0	0.849951

```
Data Stored Successfully
Training with batch size: 32, epochs: 20, learning rate: 0.01, optimizer: SGD
Current: 45/90
Training [5%] Loss: 0.5843 Accuracy: 72.75%
Training [10%] Loss: 0.5835 Accuracy: 72.92%
Training [15%] Loss: 0.5831 Accuracy: 72.92%
Training [20%] Loss: 0.5849 Accuracy: 72.92%
Training [25%] Loss: 0.5846 Accuracy: 72.92%
Training [30%] Loss: 0.5846 Accuracy: 72.92%
Training [35%] Loss: 0.5856 Accuracy: 72.92%
Training [40%] Loss: 0.5846 Accuracy: 72.92%
Training [45%] Loss: 0.5835 Accuracy: 72.92%
Training [50%] Loss: 0.5842 Accuracy: 72.92%
Training [55%] Loss: 0.5839 Accuracy: 72.92%
Training [60%] Loss: 0.5849 Accuracy: 72.92%
Training [65%] Loss: 0.5835 Accuracy: 72.92%
Training [70%] Loss: 0.5853 Accuracy: 72.92%
Training [75%] Loss: 0.5839 Accuracy: 72.92%
Training [80%] Loss: 0.5835 Accuracy: 72.92%
Training [85%] Loss: 0.5842 Accuracy: 72.92%
Training [90%] Loss: 0.5835 Accuracy: 72.92%
Training [95%] Loss: 0.5835 Accuracy: 72.92%
Training [100%] Loss: 0.5835 Accuracy: 72.92%
Time taken: 392.598112821579
```



#### Performance on test data:

Loss: 0.5751

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

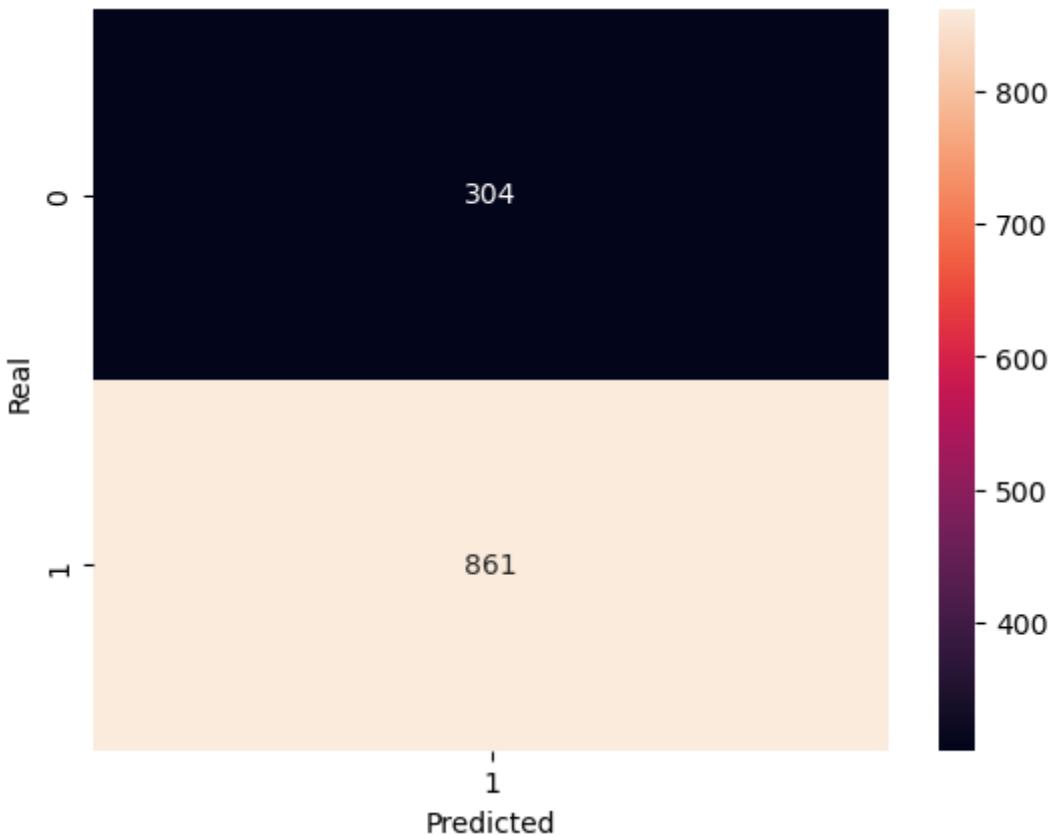


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 392.598112821579

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

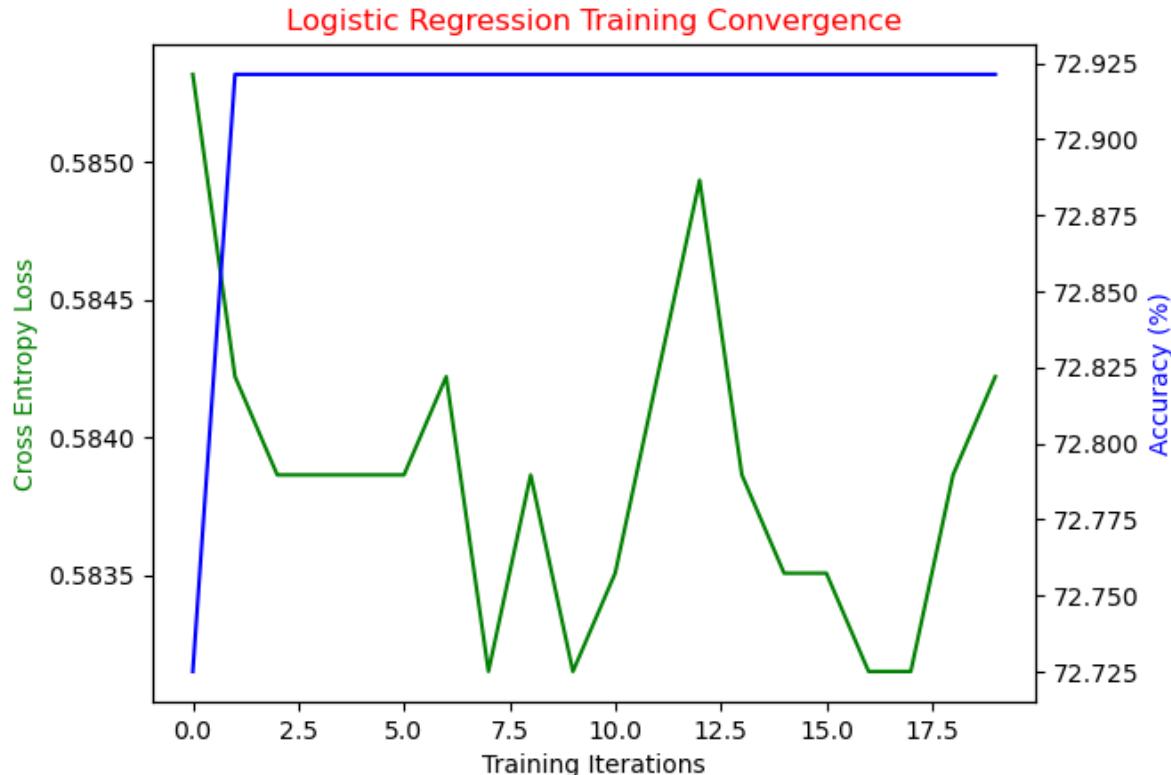
Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch32_epochs20_lr0.01_optimizerSGD	392.598113	0.739056	0.739056	1.0	0.849951
---	------------	----------	----------	-----	----------

Data Stored Successfully  
 Training with batch size: 32, epochs: 20, learning rate: 0.01, optimizer: Adam  
 Current: 46/90

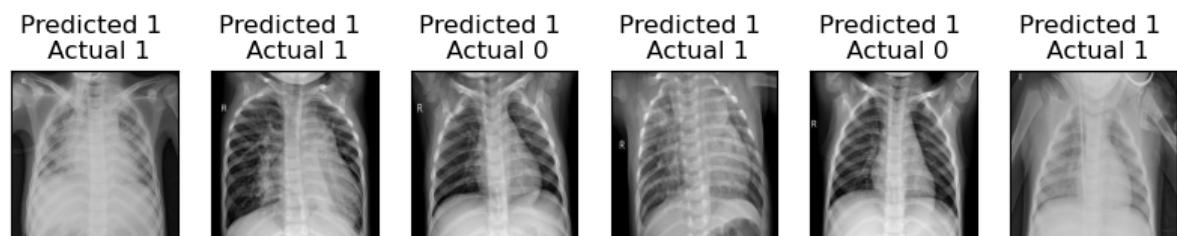
Training [5%]	Loss: 0.5853	Accuracy: 72.73%
Training [10%]	Loss: 0.5842	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5839	Accuracy: 72.92%
Training [25%]	Loss: 0.5839	Accuracy: 72.92%
Training [30%]	Loss: 0.5839	Accuracy: 72.92%
Training [35%]	Loss: 0.5842	Accuracy: 72.92%
Training [40%]	Loss: 0.5831	Accuracy: 72.92%
Training [45%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5831	Accuracy: 72.92%
Training [55%]	Loss: 0.5835	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [65%]	Loss: 0.5849	Accuracy: 72.92%
Training [70%]	Loss: 0.5839	Accuracy: 72.92%
Training [75%]	Loss: 0.5835	Accuracy: 72.92%
Training [80%]	Loss: 0.5835	Accuracy: 72.92%
Training [85%]	Loss: 0.5831	Accuracy: 72.92%
Training [90%]	Loss: 0.5831	Accuracy: 72.92%
Training [95%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5842	Accuracy: 72.92%

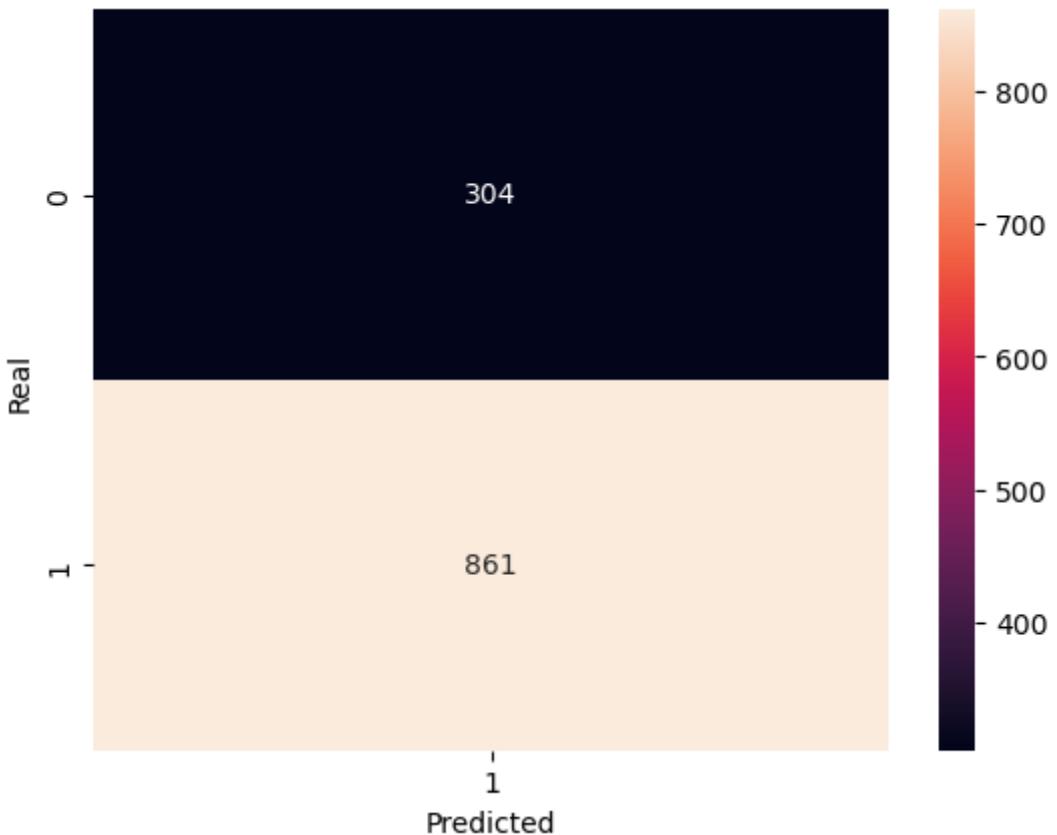
Time taken: 414.4078679084778



Performance on test data:

Loss: 0.5752  
 Accuracy: 73.91%





Time taken: 414.4078679084778

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

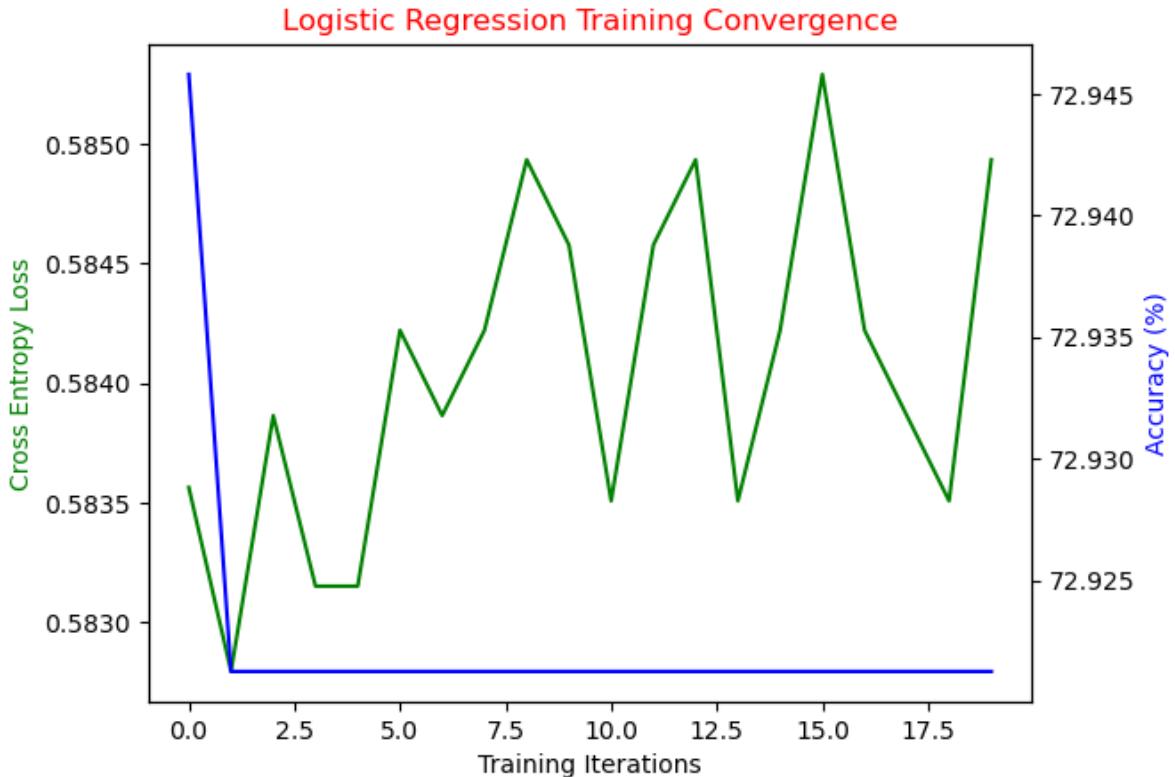
Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

<b>Logistic Regression</b>				
<b>model_batch32_epochs20_lr0.01_optimizerAdam</b>	414.407868	0.739056	0.739056	1.0 0.849951

Data Stored Successfully  
 Training with batch size: 32, epochs: 20, learning rate: 0.1, optimizer: SGD  
 Current: 47/90

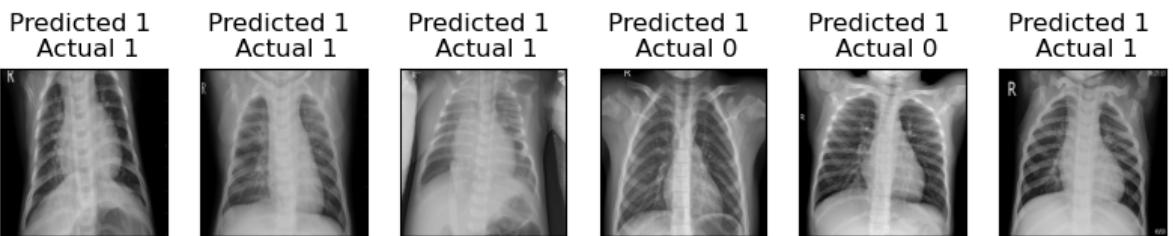
Training [5%]	Loss: 0.5836	Accuracy: 72.95%
Training [10%]	Loss: 0.5828	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5831	Accuracy: 72.92%
Training [25%]	Loss: 0.5831	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [35%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [45%]	Loss: 0.5849	Accuracy: 72.92%
Training [50%]	Loss: 0.5846	Accuracy: 72.92%
Training [55%]	Loss: 0.5835	Accuracy: 72.92%
Training [60%]	Loss: 0.5846	Accuracy: 72.92%
Training [65%]	Loss: 0.5849	Accuracy: 72.92%
Training [70%]	Loss: 0.5835	Accuracy: 72.92%
Training [75%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5853	Accuracy: 72.92%
Training [85%]	Loss: 0.5842	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [95%]	Loss: 0.5835	Accuracy: 72.92%
Training [100%]	Loss: 0.5849	Accuracy: 72.92%

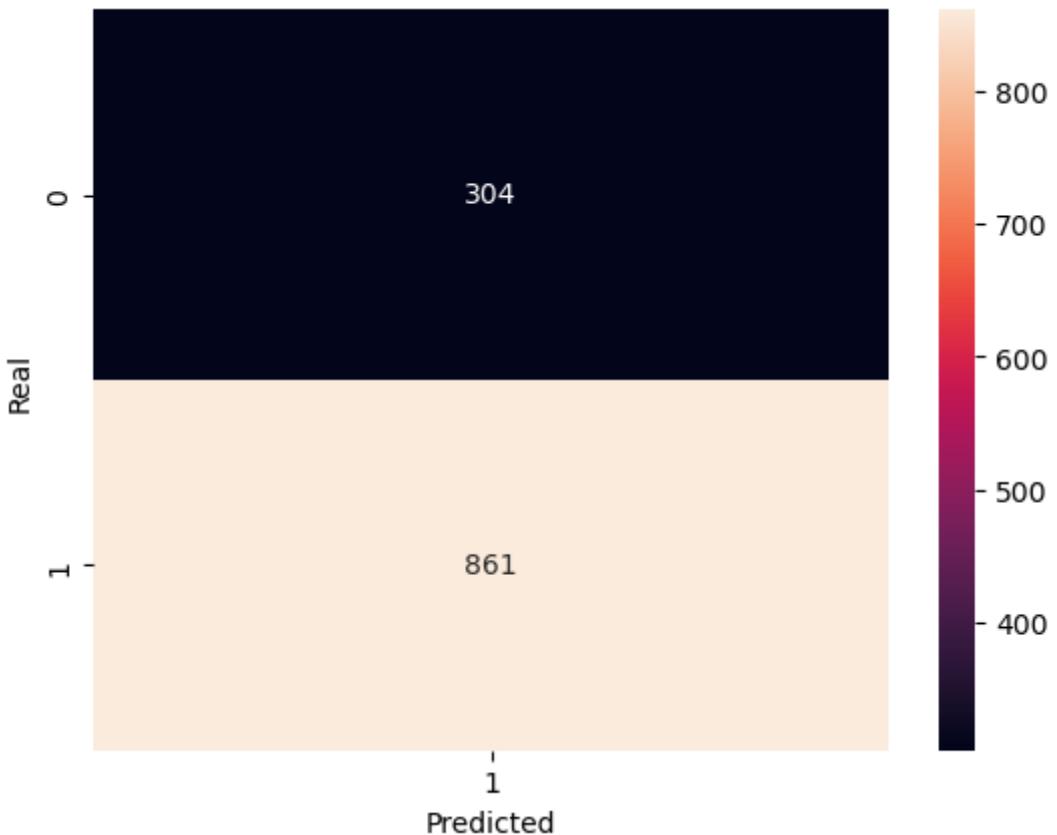
Time taken: 380.2517418861389



Performance on test data:

Loss: 0.5753  
 Accuracy: 73.91%





Time taken: 380.2517418861389

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch32_epochs20_lr0.1_optimizerSGD	380.251742	0.739056	0.739056	1.0	0.849951
--	------------	----------	----------	-----	----------

Data Stored Successfully

Training with batch size: 32, epochs: 20, learning rate: 0.1, optimizer: Adam

Current: 48/90

Training [5%]	Loss: 0.5847	Accuracy: 72.68%
Training [10%]	Loss: 0.5835	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5853	Accuracy: 72.92%
Training [25%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [35%]	Loss: 0.5835	Accuracy: 72.92%
Training [40%]	Loss: 0.5846	Accuracy: 72.92%
Training [45%]	Loss: 0.5842	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [55%]	Loss: 0.5831	Accuracy: 72.92%
Training [60%]	Loss: 0.5835	Accuracy: 72.92%
Training [65%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5853	Accuracy: 72.92%
Training [75%]	Loss: 0.5831	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [85%]	Loss: 0.5846	Accuracy: 72.92%
Training [90%]	Loss: 0.5831	Accuracy: 72.92%
Training [95%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5846	Accuracy: 72.92%

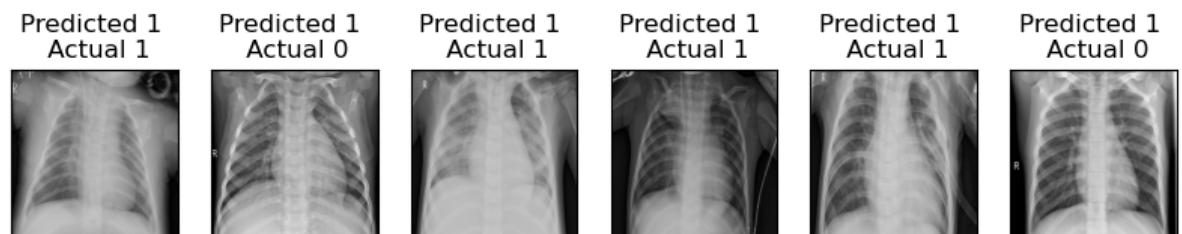
Time taken: 411.387987613678

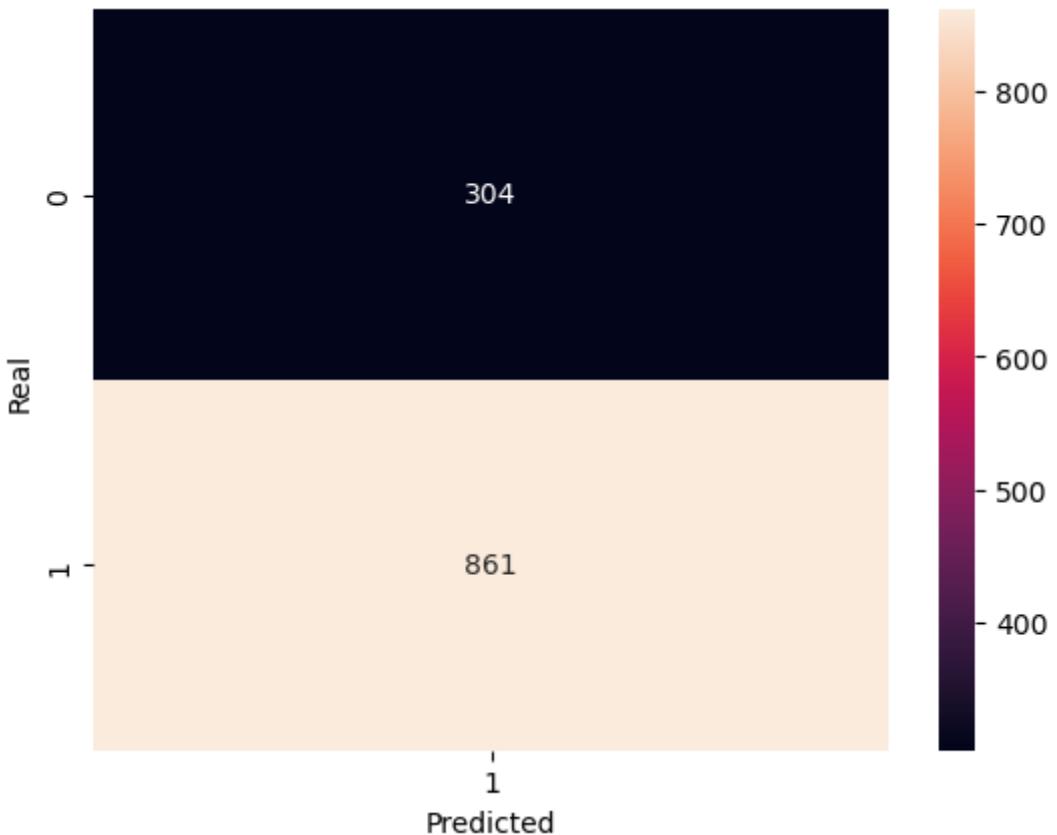


Performance on test data:

Loss: 0.5752

Accuracy: 73.91%





Time taken: 411.387987613678

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
411.387988	0.739056	0.739056	1.0	0.849951

**Logistic Regression**  
model\_batch32\_epochs20\_lr0.1\_optimizerAdam

Data Stored Successfully  
Training with batch size: 32, epochs: 20, learning rate: 1, optimizer: SGD  
Current: 49/90

Training [5%]	Loss: 0.5861	Accuracy: 72.92%
Training [10%]	Loss: 0.5842	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5831	Accuracy: 72.92%
Training [25%]	Loss: 0.5846	Accuracy: 72.92%
Training [30%]	Loss: 0.5835	Accuracy: 72.92%
Training [35%]	Loss: 0.5831	Accuracy: 72.92%
Training [40%]	Loss: 0.5831	Accuracy: 72.92%
Training [45%]	Loss: 0.5835	Accuracy: 72.92%
Training [50%]	Loss: 0.5853	Accuracy: 72.92%
Training [55%]	Loss: 0.5849	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [65%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5831	Accuracy: 72.92%
Training [75%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5831	Accuracy: 72.92%
Training [85%]	Loss: 0.5839	Accuracy: 72.92%
Training [90%]	Loss: 0.5846	Accuracy: 72.92%
Training [95%]	Loss: 0.5835	Accuracy: 72.92%
Training [100%]	Loss: 0.5849	Accuracy: 72.92%

Time taken: 378.5418047904968



Performance on test data:

Loss: 0.5753  
Accuracy: 73.91%

Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

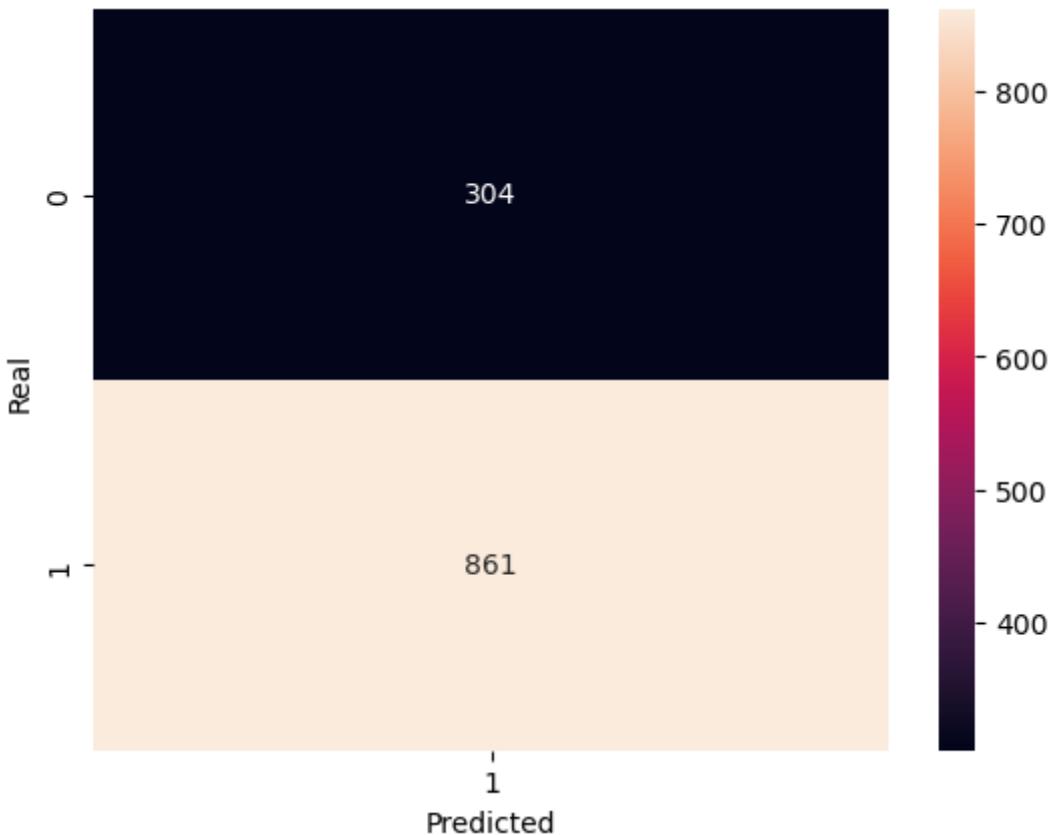


Predicted 1  
Actual 0



Predicted 1  
Actual 0





Time taken: 378.5418047904968

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

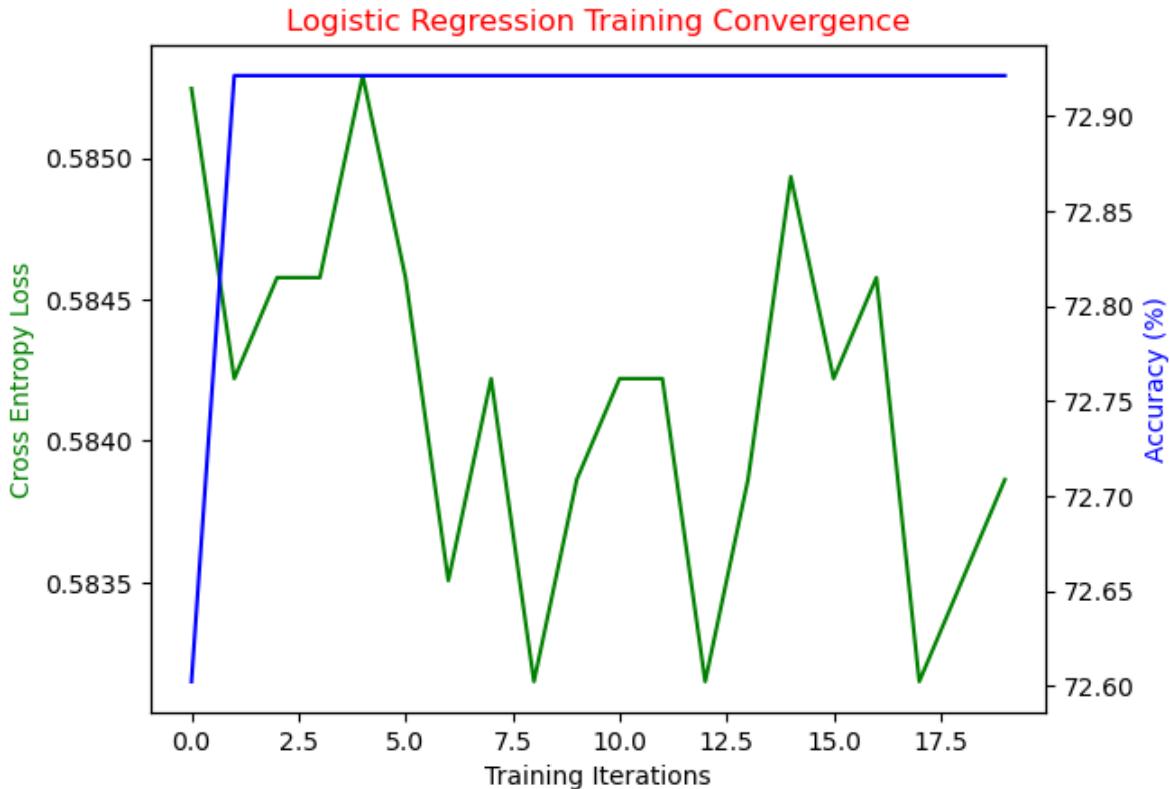
Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch32_epochs20_lr1_optimizerSGD	378.541805	0.739056	0.739056	1.0	0.849951
--	------------	----------	----------	-----	----------

Data Stored Successfully  
 Training with batch size: 32, epochs: 20, learning rate: 1, optimizer: Adam  
 Current: 50/90

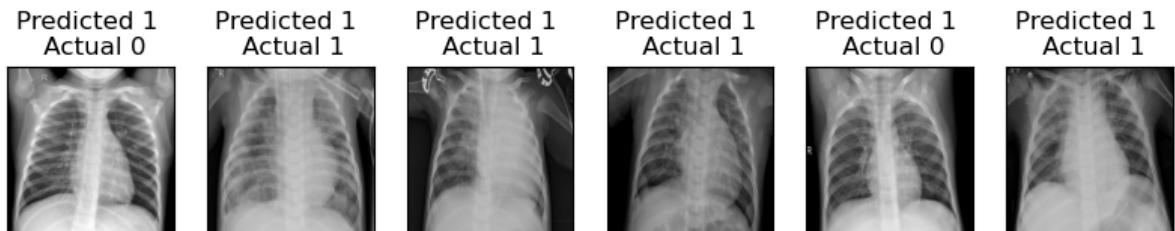
Training [5%]	Loss: 0.5852	Accuracy: 72.60%
Training [10%]	Loss: 0.5842	Accuracy: 72.92%
Training [15%]	Loss: 0.5846	Accuracy: 72.92%
Training [20%]	Loss: 0.5846	Accuracy: 72.92%
Training [25%]	Loss: 0.5853	Accuracy: 72.92%
Training [30%]	Loss: 0.5846	Accuracy: 72.92%
Training [35%]	Loss: 0.5835	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [45%]	Loss: 0.5831	Accuracy: 72.92%
Training [50%]	Loss: 0.5839	Accuracy: 72.92%
Training [55%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [65%]	Loss: 0.5831	Accuracy: 72.92%
Training [70%]	Loss: 0.5839	Accuracy: 72.92%
Training [75%]	Loss: 0.5849	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [85%]	Loss: 0.5846	Accuracy: 72.92%
Training [90%]	Loss: 0.5831	Accuracy: 72.92%
Training [95%]	Loss: 0.5835	Accuracy: 72.92%
Training [100%]	Loss: 0.5839	Accuracy: 72.92%

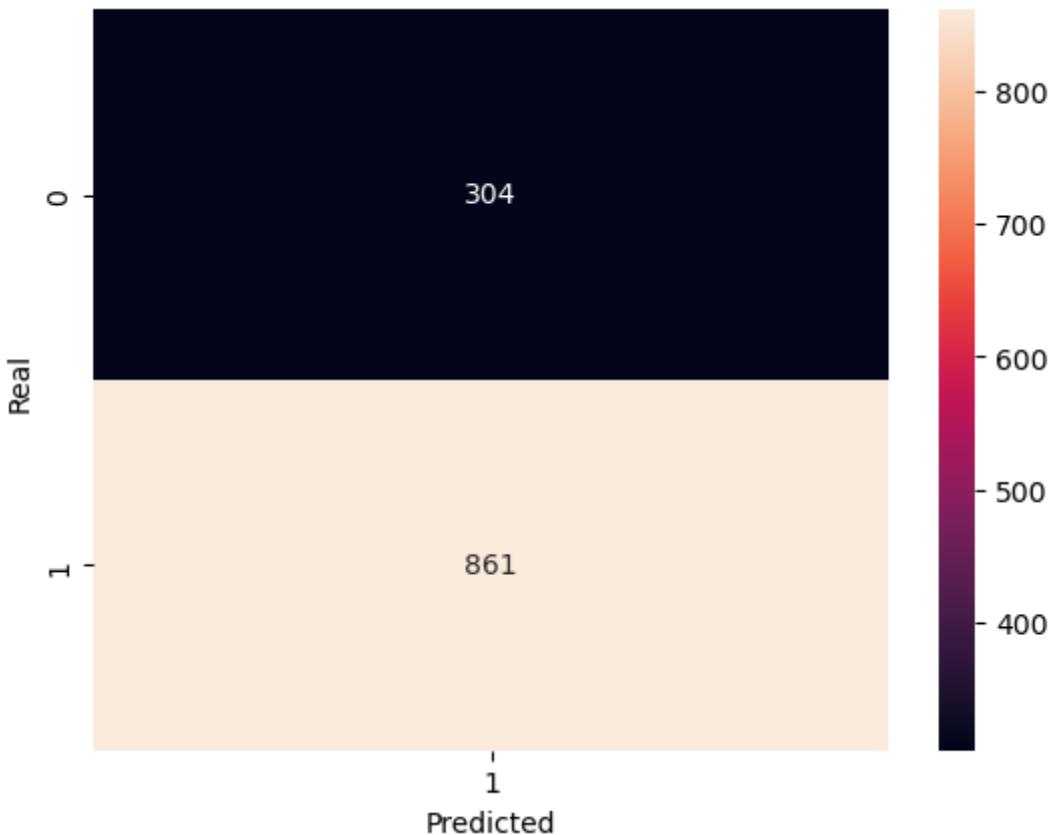
Time taken: 419.5491225719452



Performance on test data:

Loss: 0.5752  
 Accuracy: 73.91%





Time taken: 419.5491225719452

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

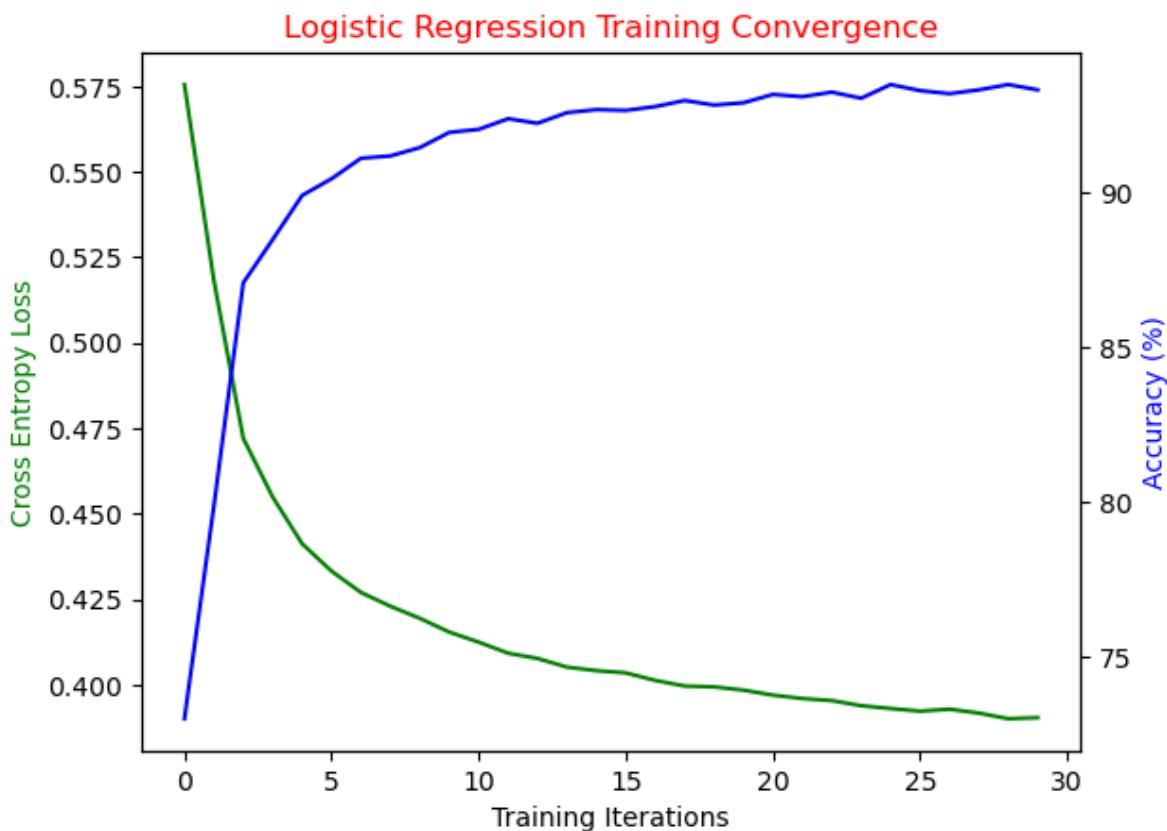
Time	Accuracy	Precision	Recall	F1 score
419.549123	0.739056	0.739056	1.0	0.849951

**Logistic Regression**  
**model\_batch32\_epochs20\_lr1\_optimizerAdam**

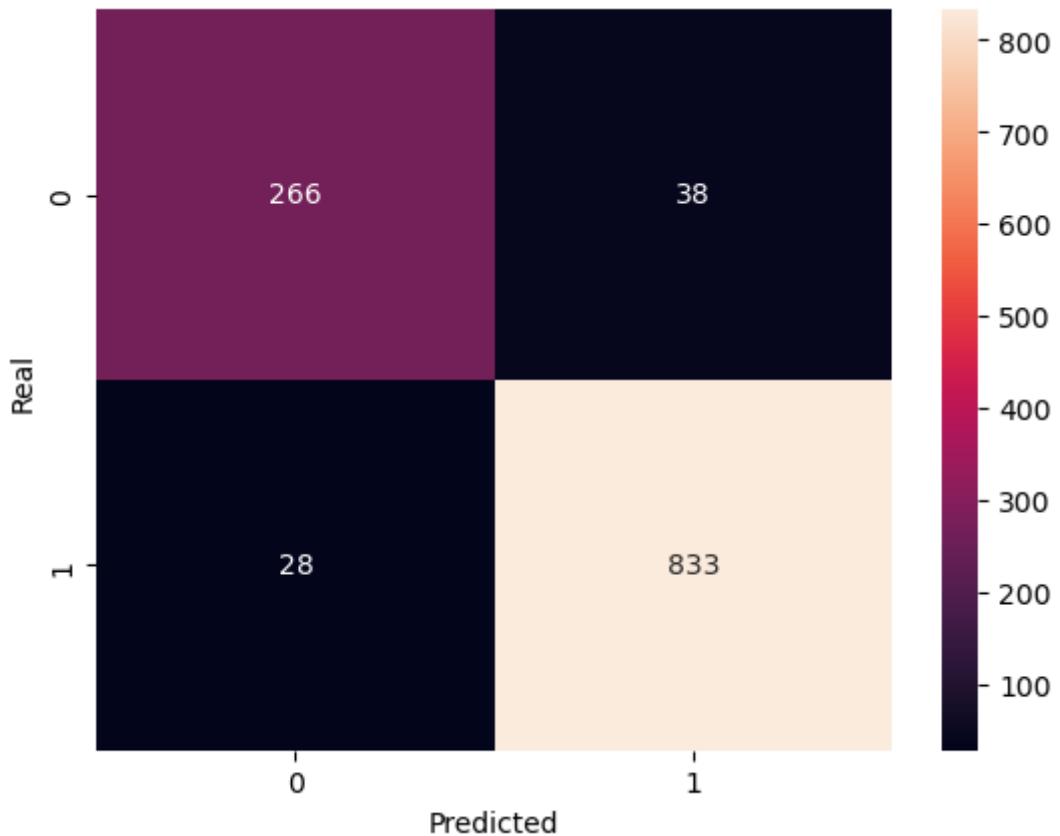
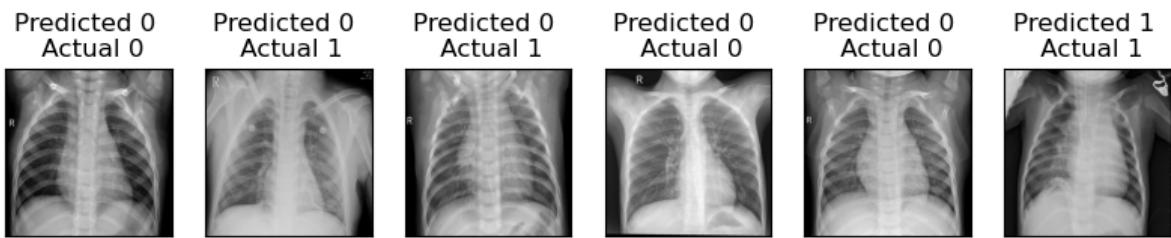
Data Stored Successfully  
Training with batch size: 32, epochs: 30, learning rate: 0.0001, optimizer: SGD  
Current: 51/90

Training [%]	Loss:	Accuracy:
3%	0.5755	72.99%
7%	0.5182	79.86%
10%	0.4720	87.07%
13%	0.4549	88.47%
17%	0.4412	89.89%
20%	0.4332	90.43%
23%	0.4270	91.10%
27%	0.4230	91.17%
30%	0.4194	91.44%
33%	0.4154	91.93%
37%	0.4125	92.03%
40%	0.4092	92.37%
43%	0.4077	92.22%
47%	0.4052	92.57%
50%	0.4041	92.67%
53%	0.4035	92.64%
57%	0.4013	92.76%
60%	0.3996	92.96%
63%	0.3994	92.81%
67%	0.3984	92.89%
70%	0.3970	93.16%
73%	0.3960	93.08%
77%	0.3954	93.23%
80%	0.3939	93.03%
83%	0.3931	93.48%
87%	0.3923	93.28%
90%	0.3929	93.18%
93%	0.3917	93.30%
97%	0.3901	93.48%
100%	0.3904	93.30%

Time taken: 569.9762291908264



Performance on test data:  
Loss: 0.3829  
Accuracy: 94.33%



Time taken: 569.9762291908264

Test size: 1165

Total Accuracy: 0.9433476394849786

Total Precision: 0.9563719862227325

Total Recall: 0.967479674796748

Total F1 Score: 0.9618937644341802

Classification Report:

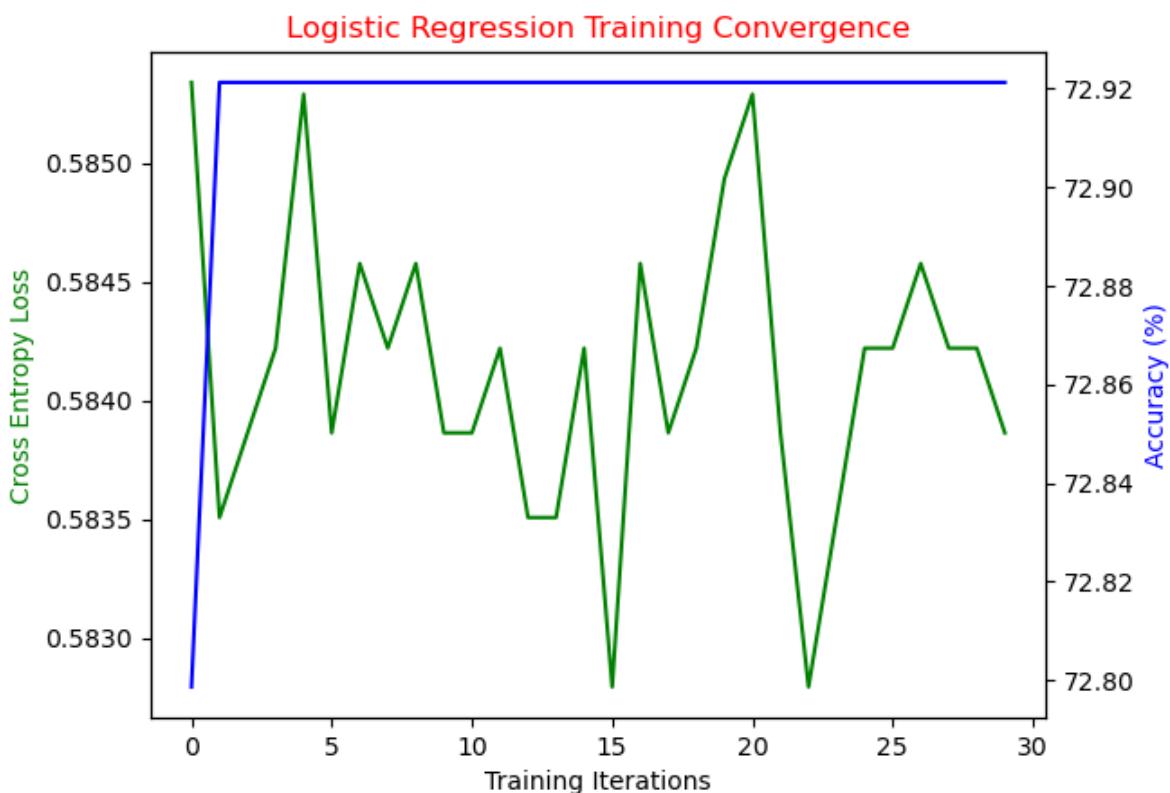
	precision	recall	f1-score	support
0	0.90	0.88	0.89	304
1	0.96	0.97	0.96	861
accuracy			0.94	1165
macro avg	0.93	0.92	0.93	1165
weighted avg	0.94	0.94	0.94	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch32_epochs30_lr0.0001_optimizerSGD	569.976229	0.943348	0.956372	0.96748	0.961894

Data Stored Successfully  
 Training with batch size: 32, epochs: 30, learning rate: 0.0001, optimizer: Adam  
 Current: 52/90

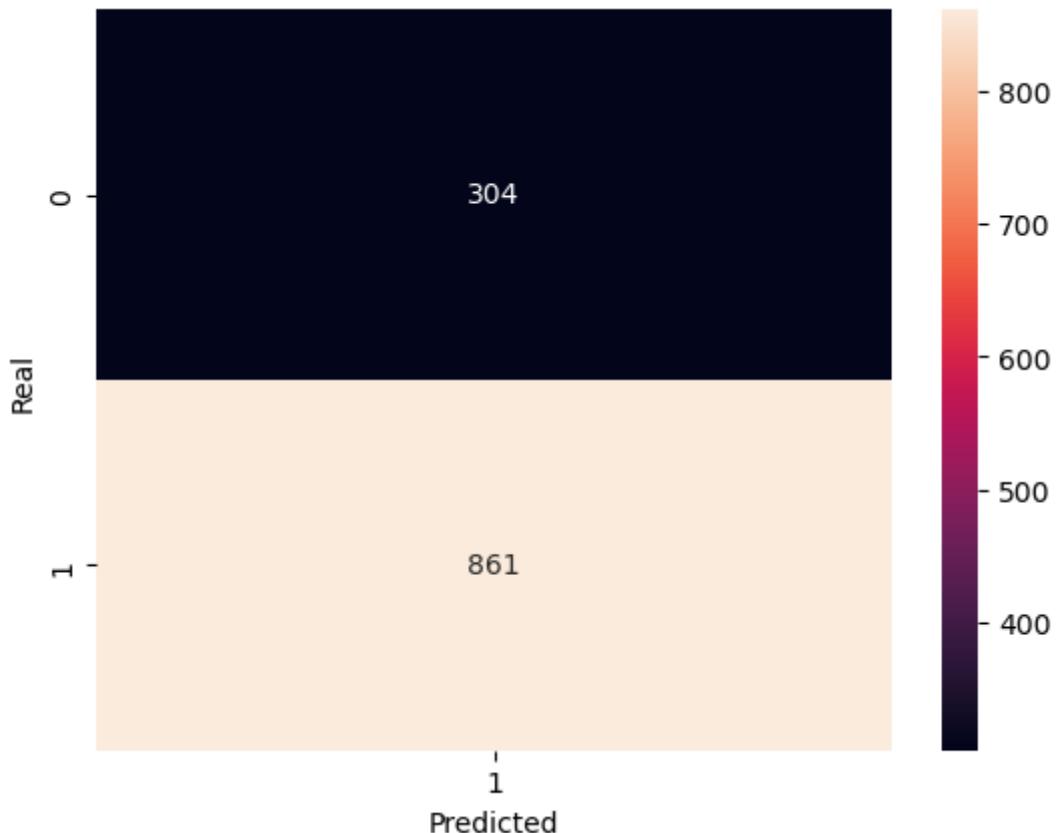
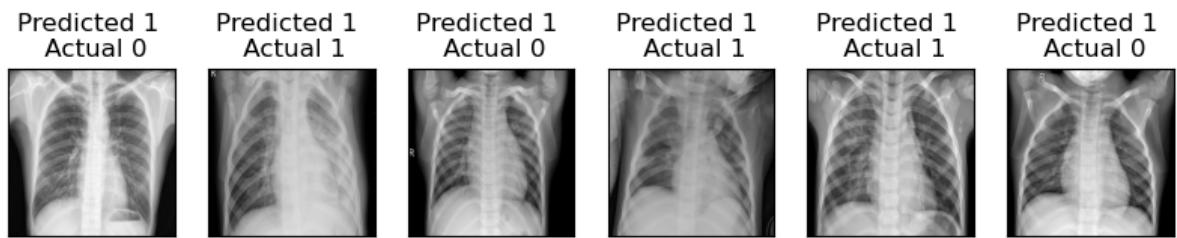
Training [3%]	Loss: 0.5853	Accuracy: 72.80%
Training [7%]	Loss: 0.5835	Accuracy: 72.92%
Training [10%]	Loss: 0.5839	Accuracy: 72.92%
Training [13%]	Loss: 0.5842	Accuracy: 72.92%
Training [17%]	Loss: 0.5853	Accuracy: 72.92%
Training [20%]	Loss: 0.5839	Accuracy: 72.92%
Training [23%]	Loss: 0.5846	Accuracy: 72.92%
Training [27%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5846	Accuracy: 72.92%
Training [33%]	Loss: 0.5839	Accuracy: 72.92%
Training [37%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [43%]	Loss: 0.5835	Accuracy: 72.92%
Training [47%]	Loss: 0.5835	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [53%]	Loss: 0.5828	Accuracy: 72.92%
Training [57%]	Loss: 0.5846	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5842	Accuracy: 72.92%
Training [67%]	Loss: 0.5849	Accuracy: 72.92%
Training [70%]	Loss: 0.5853	Accuracy: 72.92%
Training [73%]	Loss: 0.5839	Accuracy: 72.92%
Training [77%]	Loss: 0.5828	Accuracy: 72.92%
Training [80%]	Loss: 0.5835	Accuracy: 72.92%
Training [83%]	Loss: 0.5842	Accuracy: 72.92%
Training [87%]	Loss: 0.5842	Accuracy: 72.92%
Training [90%]	Loss: 0.5846	Accuracy: 72.92%
Training [93%]	Loss: 0.5842	Accuracy: 72.92%
Training [97%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5839	Accuracy: 72.92%

Time taken: 625.048401594162



Performance on test data:

Loss: 0.5752  
 Accuracy: 73.91%



Time taken: 625.048401594162

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr0.0001_optimizerAdam</b>	625.048402	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 32, epochs: 30, learning rate: 0.001, optimizer: SGD

Current: 53/90

Training [3%]	Loss: 0.5846	Accuracy: 72.92%
Training [7%]	Loss: 0.5849	Accuracy: 72.92%
Training [10%]	Loss: 0.5842	Accuracy: 72.92%
Training [13%]	Loss: 0.5839	Accuracy: 72.92%
Training [17%]	Loss: 0.5846	Accuracy: 72.92%
Training [20%]	Loss: 0.5839	Accuracy: 72.92%
Training [23%]	Loss: 0.5839	Accuracy: 72.92%
Training [27%]	Loss: 0.5835	Accuracy: 72.92%
Training [30%]	Loss: 0.5839	Accuracy: 72.92%
Training [33%]	Loss: 0.5846	Accuracy: 72.92%
Training [37%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5839	Accuracy: 72.92%
Training [43%]	Loss: 0.5842	Accuracy: 72.92%
Training [47%]	Loss: 0.5846	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [53%]	Loss: 0.5849	Accuracy: 72.92%
Training [57%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5849	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [73%]	Loss: 0.5839	Accuracy: 72.92%
Training [77%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5835	Accuracy: 72.92%
Training [83%]	Loss: 0.5839	Accuracy: 72.92%
Training [87%]	Loss: 0.5842	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [93%]	Loss: 0.5839	Accuracy: 72.92%
Training [97%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5839	Accuracy: 72.92%

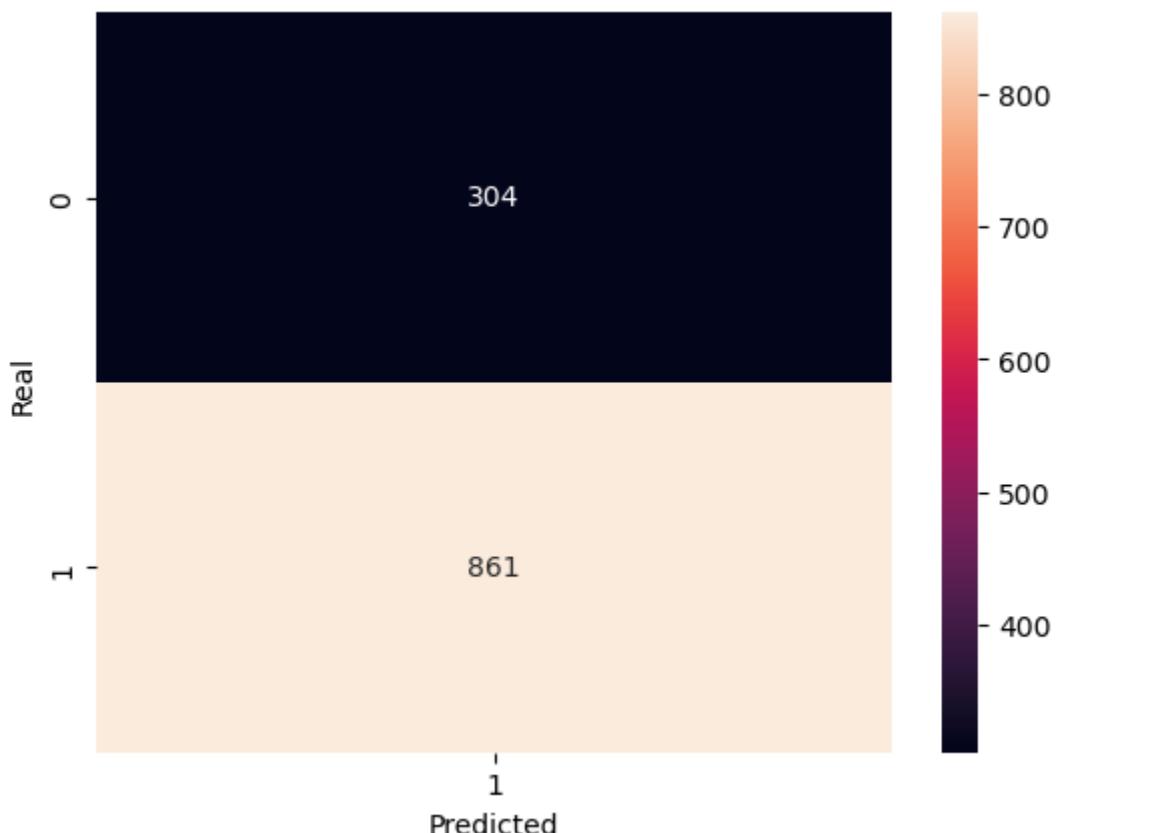
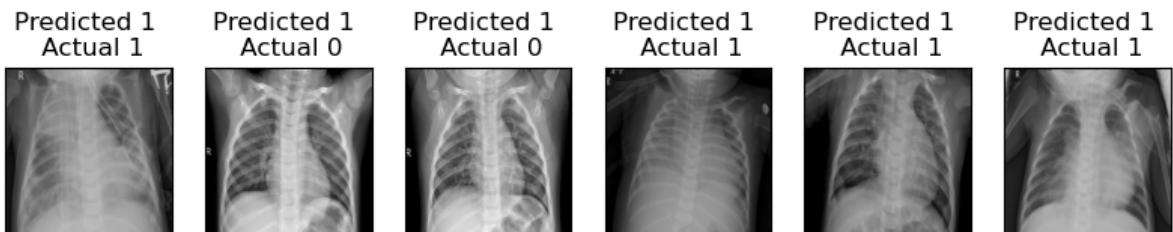
Time taken: 569.826878786087



Performance on test data:

Loss: 0.5752

Accuracy: 73.91%



```

Time taken: 569.826878786087
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr0.001_optimizerSGD</b>	569.826879	0.739056	0.739056	1.0	0.849951

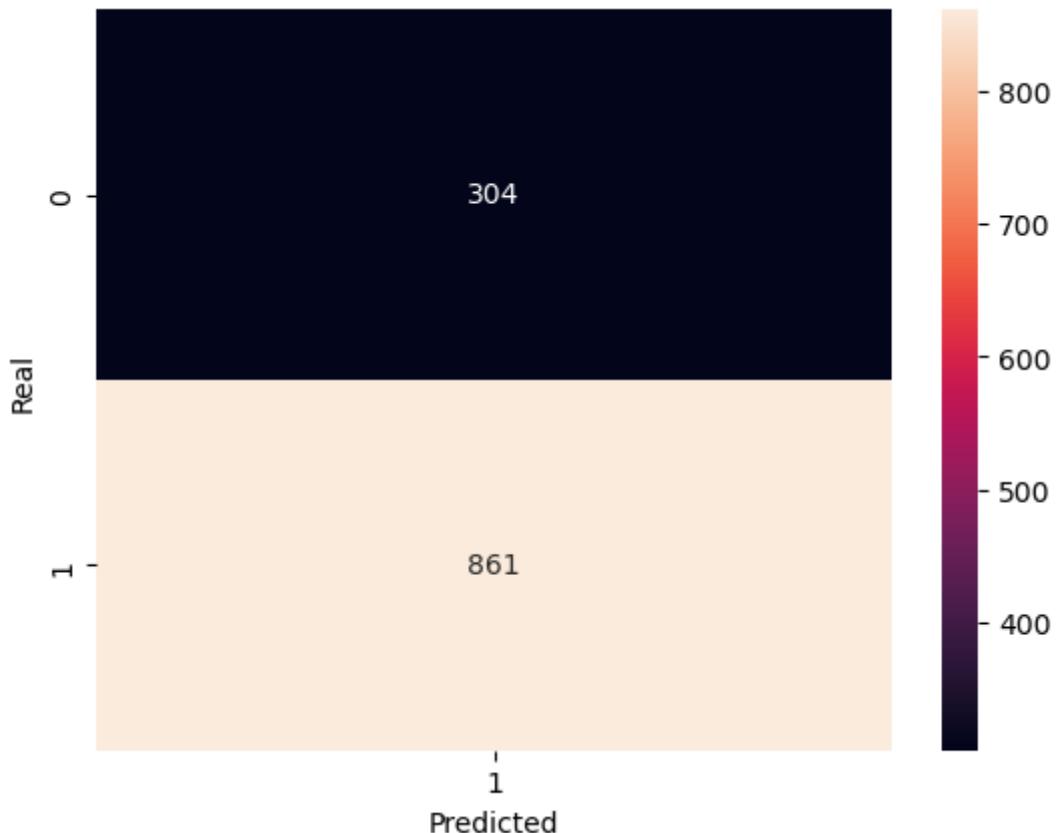
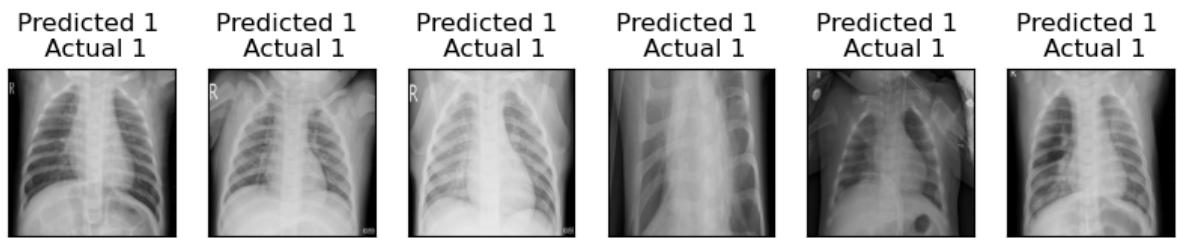
Data Stored Successfully  
 Training with batch size: 32, epochs: 30, learning rate: 0.001, optimizer: Adam  
 Current: 54/90

Training [3%]	Loss: 0.5853	Accuracy: 72.48%
Training [7%]	Loss: 0.5828	Accuracy: 72.92%
Training [10%]	Loss: 0.5839	Accuracy: 72.92%
Training [13%]	Loss: 0.5842	Accuracy: 72.92%
Training [17%]	Loss: 0.5835	Accuracy: 72.92%
Training [20%]	Loss: 0.5839	Accuracy: 72.92%
Training [23%]	Loss: 0.5831	Accuracy: 72.92%
Training [27%]	Loss: 0.5849	Accuracy: 72.92%
Training [30%]	Loss: 0.5831	Accuracy: 72.92%
Training [33%]	Loss: 0.5839	Accuracy: 72.92%
Training [37%]	Loss: 0.5853	Accuracy: 72.92%
Training [40%]	Loss: 0.5835	Accuracy: 72.92%
Training [43%]	Loss: 0.5842	Accuracy: 72.92%
Training [47%]	Loss: 0.5835	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [53%]	Loss: 0.5835	Accuracy: 72.92%
Training [57%]	Loss: 0.5835	Accuracy: 72.92%
Training [60%]	Loss: 0.5849	Accuracy: 72.92%
Training [63%]	Loss: 0.5831	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5849	Accuracy: 72.92%
Training [73%]	Loss: 0.5842	Accuracy: 72.92%
Training [77%]	Loss: 0.5846	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [83%]	Loss: 0.5831	Accuracy: 72.92%
Training [87%]	Loss: 0.5853	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [93%]	Loss: 0.5842	Accuracy: 72.92%
Training [97%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5849	Accuracy: 72.92%

Time taken: 620.8634331226349



Performance on test data:  
 Loss: 0.5753  
 Accuracy: 73.91%



Time taken: 620.8634331226349

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

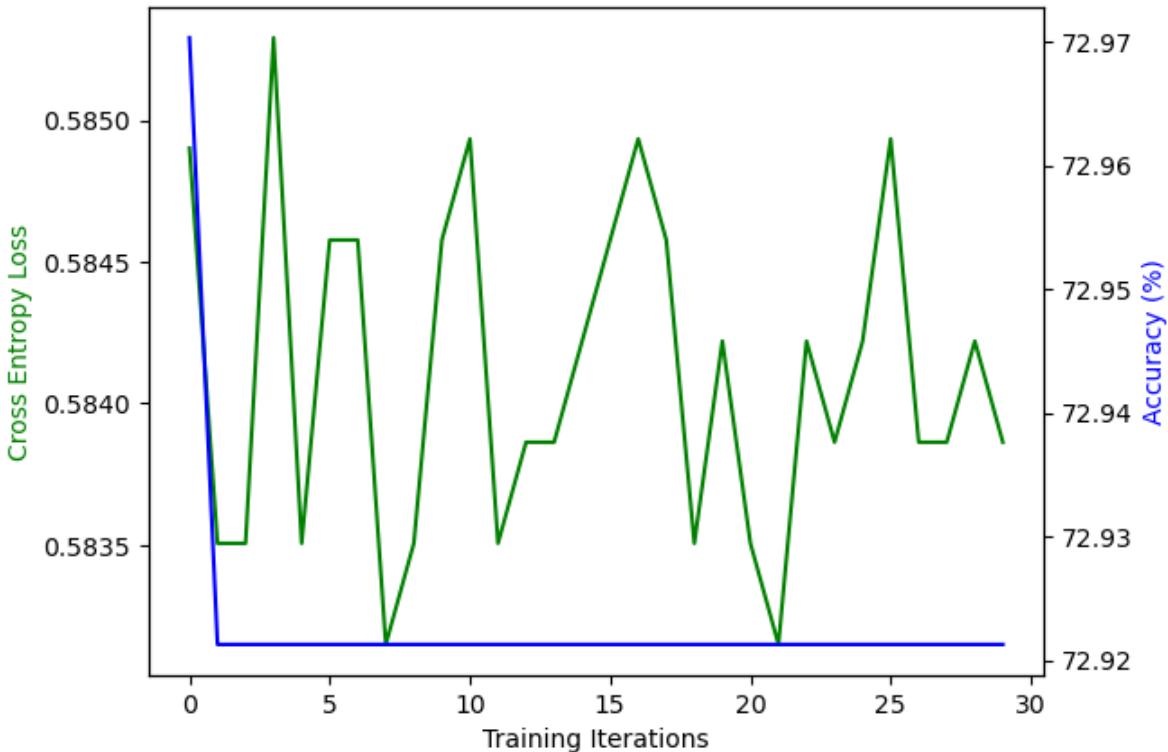
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr0.001_optimizerAdam</b>	620.863433	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 32, epochs: 30, learning rate: 0.01, optimizer: SGD  
Current: 55/90

Training [3%]	Loss: 0.5849	Accuracy: 72.97%
Training [7%]	Loss: 0.5835	Accuracy: 72.92%
Training [10%]	Loss: 0.5835	Accuracy: 72.92%
Training [13%]	Loss: 0.5853	Accuracy: 72.92%
Training [17%]	Loss: 0.5835	Accuracy: 72.92%
Training [20%]	Loss: 0.5846	Accuracy: 72.92%
Training [23%]	Loss: 0.5846	Accuracy: 72.92%
Training [27%]	Loss: 0.5831	Accuracy: 72.92%
Training [30%]	Loss: 0.5835	Accuracy: 72.92%
Training [33%]	Loss: 0.5846	Accuracy: 72.92%
Training [37%]	Loss: 0.5849	Accuracy: 72.92%
Training [40%]	Loss: 0.5835	Accuracy: 72.92%
Training [43%]	Loss: 0.5839	Accuracy: 72.92%
Training [47%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [53%]	Loss: 0.5846	Accuracy: 72.92%
Training [57%]	Loss: 0.5849	Accuracy: 72.92%
Training [60%]	Loss: 0.5846	Accuracy: 72.92%
Training [63%]	Loss: 0.5835	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5835	Accuracy: 72.92%
Training [73%]	Loss: 0.5831	Accuracy: 72.92%
Training [77%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [83%]	Loss: 0.5842	Accuracy: 72.92%
Training [87%]	Loss: 0.5849	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [93%]	Loss: 0.5839	Accuracy: 72.92%
Training [97%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5839	Accuracy: 72.92%

Time taken: 570.585643529892

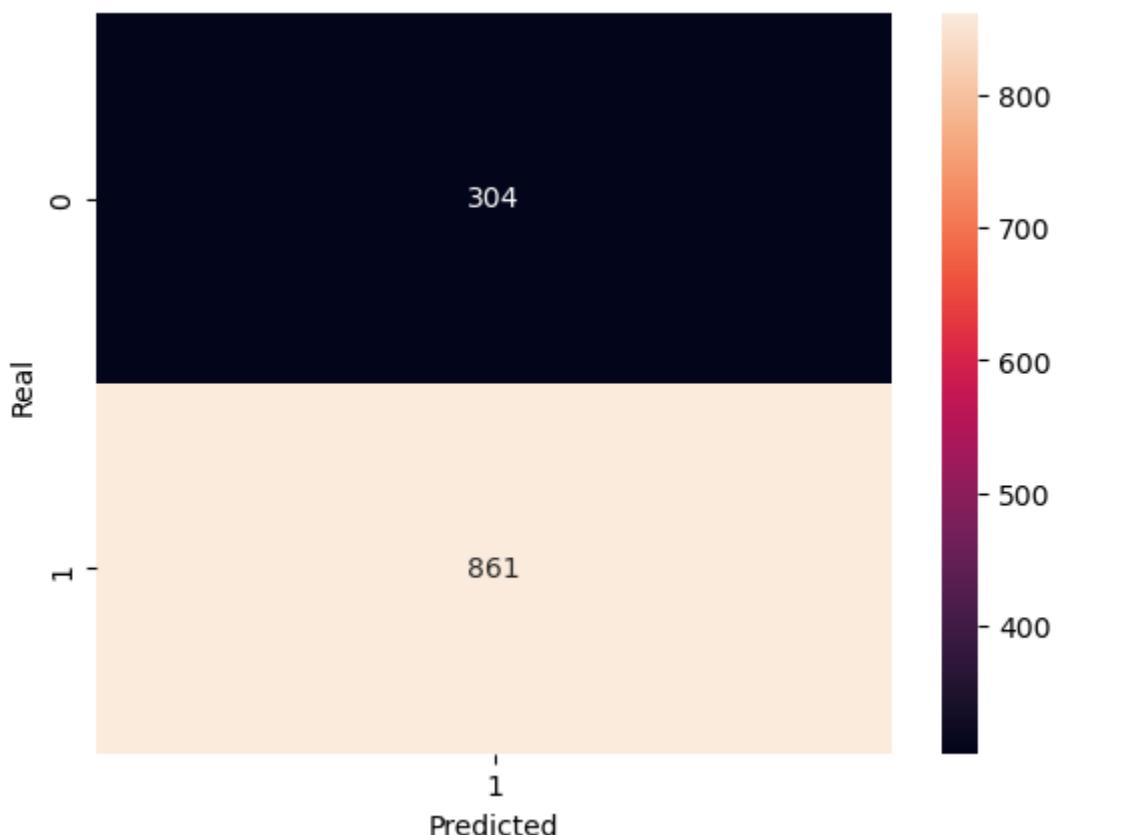
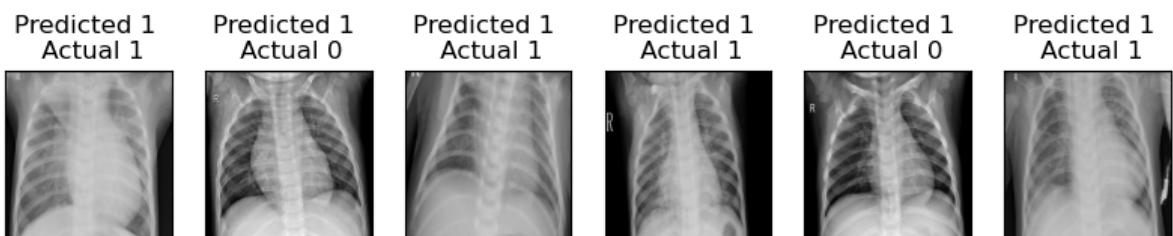
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5752

Accuracy: 73.91%



```

Time taken: 570.585643529892
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression model_batch32_epochs30_lr0.01_optimizerSGD</b>	570.585644	0.739056	0.739056	1.0	0.849951

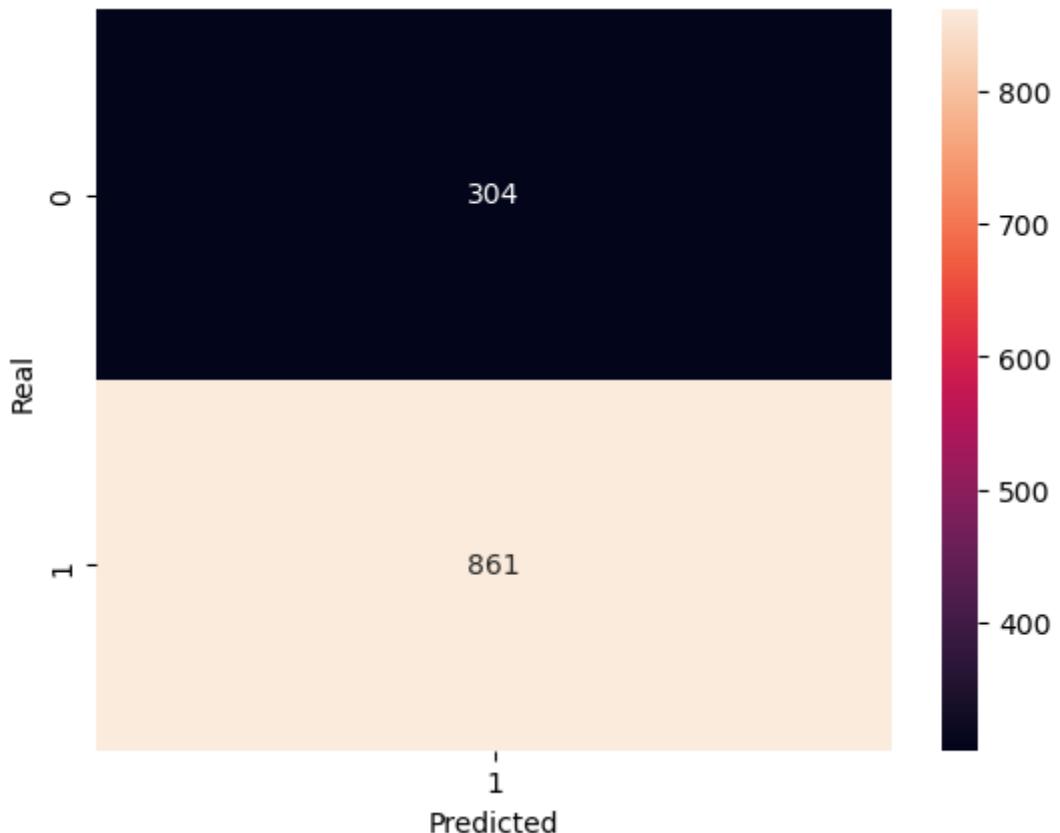
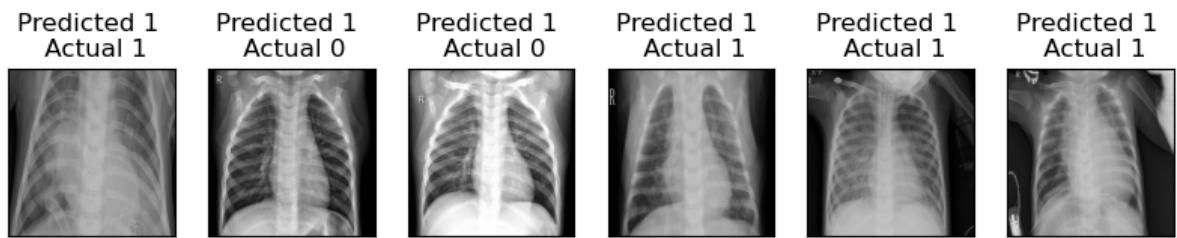
Data Stored Successfully  
 Training with batch size: 32, epochs: 30, learning rate: 0.01, optimizer: Adam  
 Current: 56/90

Training [3%]	Loss: 0.5857	Accuracy: 72.48%
Training [7%]	Loss: 0.5853	Accuracy: 72.92%
Training [10%]	Loss: 0.5842	Accuracy: 72.92%
Training [13%]	Loss: 0.5835	Accuracy: 72.92%
Training [17%]	Loss: 0.5853	Accuracy: 72.92%
Training [20%]	Loss: 0.5846	Accuracy: 72.92%
Training [23%]	Loss: 0.5839	Accuracy: 72.92%
Training [27%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5839	Accuracy: 72.92%
Training [33%]	Loss: 0.5835	Accuracy: 72.92%
Training [37%]	Loss: 0.5835	Accuracy: 72.92%
Training [40%]	Loss: 0.5846	Accuracy: 72.92%
Training [43%]	Loss: 0.5839	Accuracy: 72.92%
Training [47%]	Loss: 0.5831	Accuracy: 72.92%
Training [50%]	Loss: 0.5849	Accuracy: 72.92%
Training [53%]	Loss: 0.5853	Accuracy: 72.92%
Training [57%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5842	Accuracy: 72.92%
Training [67%]	Loss: 0.5839	Accuracy: 72.92%
Training [70%]	Loss: 0.5839	Accuracy: 72.92%
Training [73%]	Loss: 0.5835	Accuracy: 72.92%
Training [77%]	Loss: 0.5842	Accuracy: 72.92%
Training [80%]	Loss: 0.5849	Accuracy: 72.92%
Training [83%]	Loss: 0.5839	Accuracy: 72.92%
Training [87%]	Loss: 0.5835	Accuracy: 72.92%
Training [90%]	Loss: 0.5849	Accuracy: 72.92%
Training [93%]	Loss: 0.5846	Accuracy: 72.92%
Training [97%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5842	Accuracy: 72.92%

Time taken: 622.9756751060486



Performance on test data:  
 Loss: 0.5752  
 Accuracy: 73.91%



Time taken: 622.9756751060486

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr0.01_optimizerAdam</b>	622.975675	0.739056	0.739056	1.0	0.849951

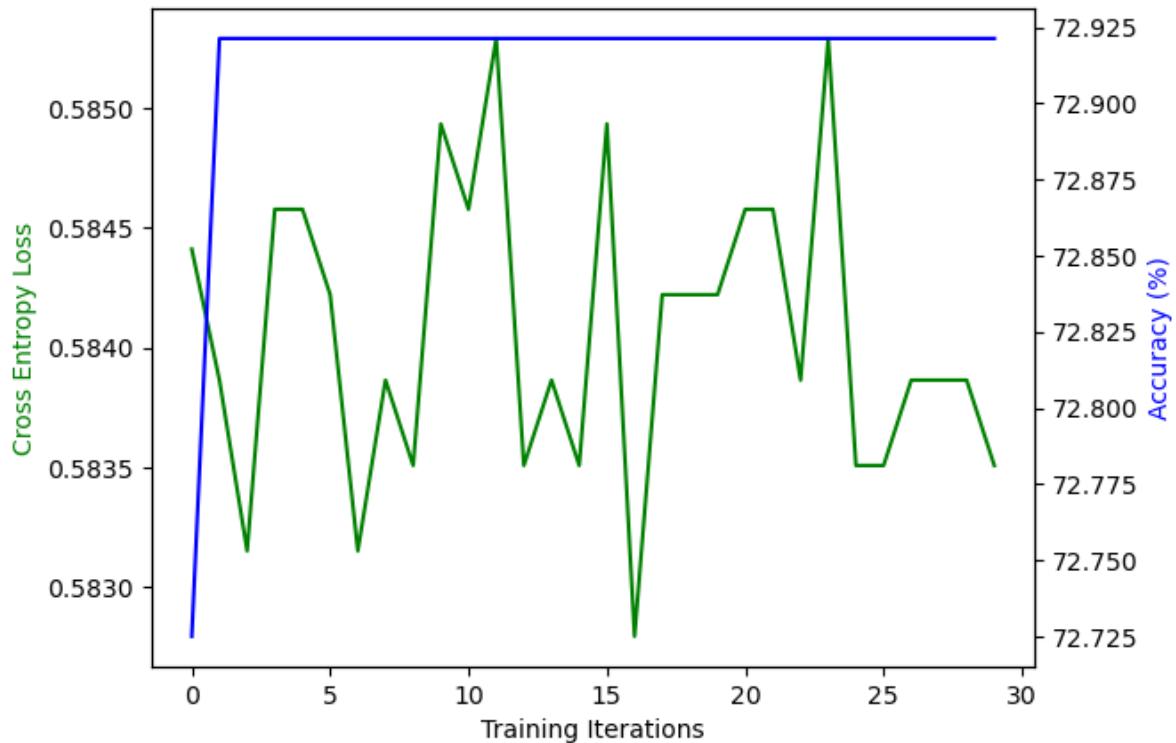
Data Stored Successfully

Training with batch size: 32, epochs: 30, learning rate: 0.1, optimizer: SGD  
Current: 57/90

Training [3%]	Loss: 0.5844	Accuracy: 72.73%
Training [7%]	Loss: 0.5839	Accuracy: 72.92%
Training [10%]	Loss: 0.5831	Accuracy: 72.92%
Training [13%]	Loss: 0.5846	Accuracy: 72.92%
Training [17%]	Loss: 0.5846	Accuracy: 72.92%
Training [20%]	Loss: 0.5842	Accuracy: 72.92%
Training [23%]	Loss: 0.5831	Accuracy: 72.92%
Training [27%]	Loss: 0.5839	Accuracy: 72.92%
Training [30%]	Loss: 0.5835	Accuracy: 72.92%
Training [33%]	Loss: 0.5849	Accuracy: 72.92%
Training [37%]	Loss: 0.5846	Accuracy: 72.92%
Training [40%]	Loss: 0.5853	Accuracy: 72.92%
Training [43%]	Loss: 0.5835	Accuracy: 72.92%
Training [47%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5835	Accuracy: 72.92%
Training [53%]	Loss: 0.5849	Accuracy: 72.92%
Training [57%]	Loss: 0.5828	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [63%]	Loss: 0.5842	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5846	Accuracy: 72.92%
Training [73%]	Loss: 0.5846	Accuracy: 72.92%
Training [77%]	Loss: 0.5839	Accuracy: 72.92%
Training [80%]	Loss: 0.5853	Accuracy: 72.92%
Training [83%]	Loss: 0.5835	Accuracy: 72.92%
Training [87%]	Loss: 0.5835	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [93%]	Loss: 0.5839	Accuracy: 72.92%
Training [97%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5835	Accuracy: 72.92%

Time taken: 567.6742696762085

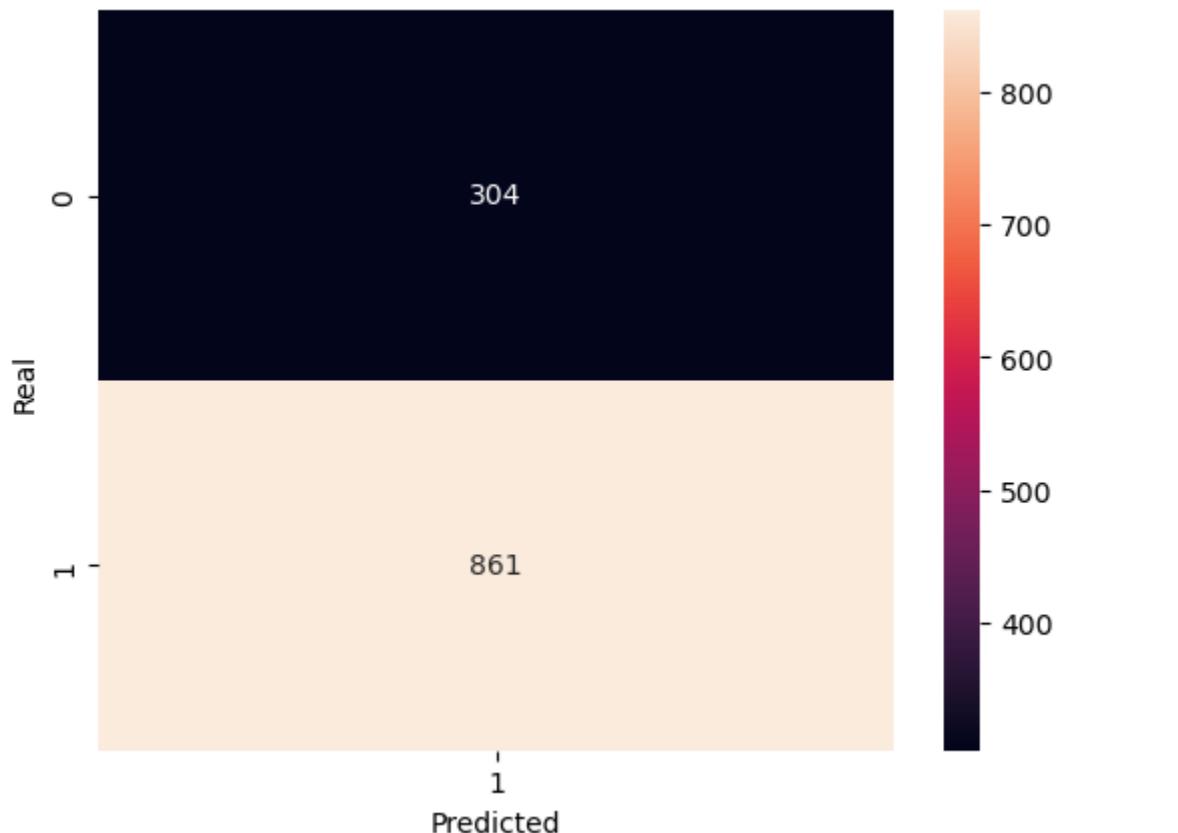
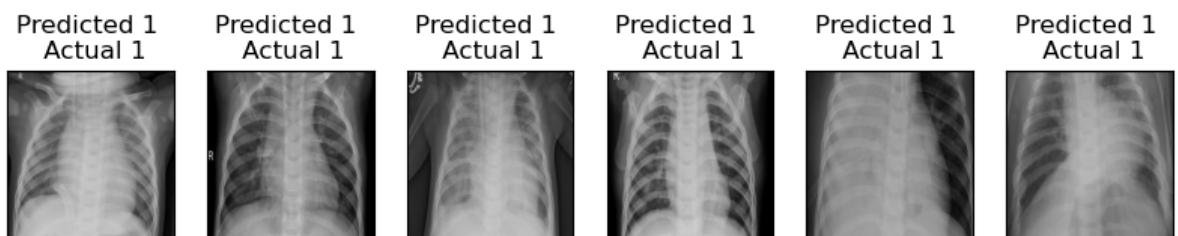
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5751

Accuracy: 73.91%



```

Time taken: 567.6742696762085
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr0.1_optimizerSGD</b>	567.67427	0.739056	0.739056	1.0	0.849951

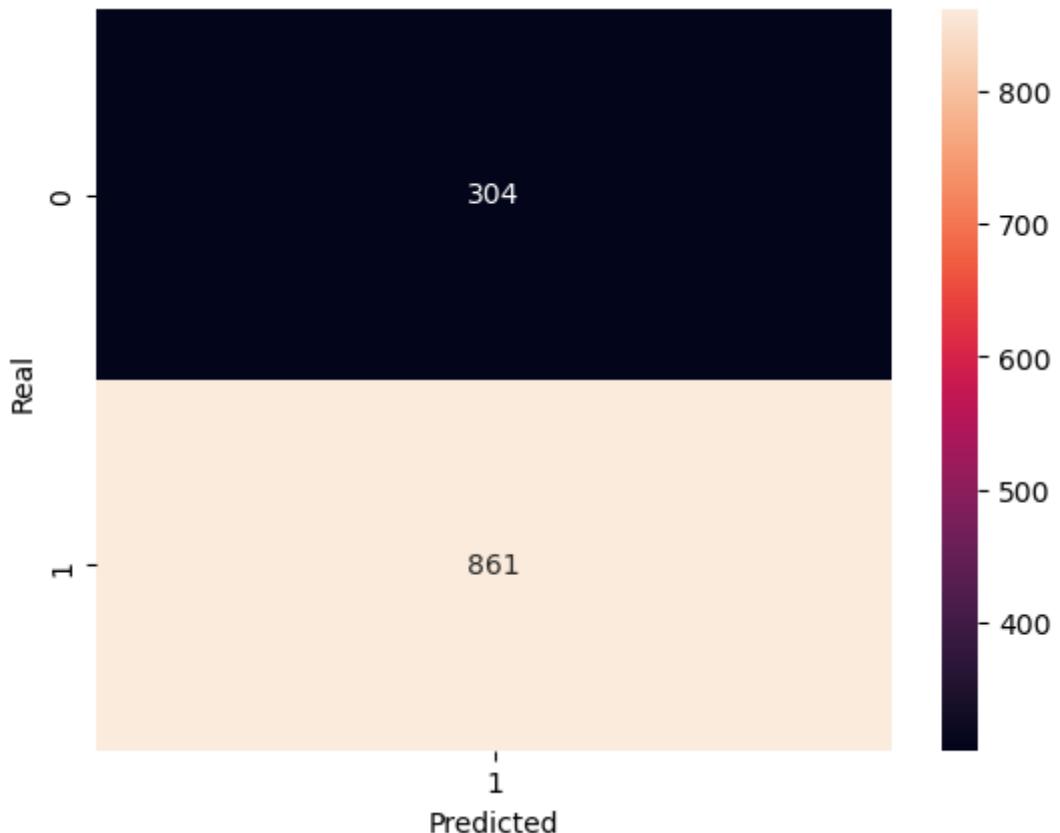
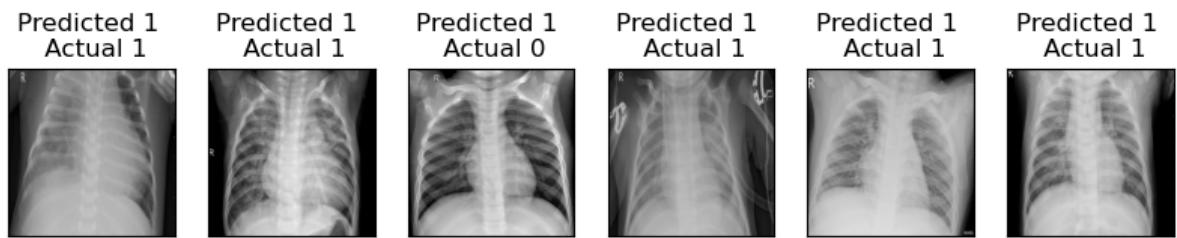
Data Stored Successfully  
 Training with batch size: 32, epochs: 30, learning rate: 0.1, optimizer: Adam  
 Current: 58/90

Training [3%]	Loss: 0.5847	Accuracy: 72.85%
Training [7%]	Loss: 0.5849	Accuracy: 72.92%
Training [10%]	Loss: 0.5835	Accuracy: 72.92%
Training [13%]	Loss: 0.5842	Accuracy: 72.92%
Training [17%]	Loss: 0.5846	Accuracy: 72.92%
Training [20%]	Loss: 0.5846	Accuracy: 72.92%
Training [23%]	Loss: 0.5835	Accuracy: 72.92%
Training [27%]	Loss: 0.5835	Accuracy: 72.92%
Training [30%]	Loss: 0.5831	Accuracy: 72.92%
Training [33%]	Loss: 0.5831	Accuracy: 72.92%
Training [37%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [43%]	Loss: 0.5842	Accuracy: 72.92%
Training [47%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5846	Accuracy: 72.92%
Training [53%]	Loss: 0.5839	Accuracy: 72.92%
Training [57%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [63%]	Loss: 0.5842	Accuracy: 72.92%
Training [67%]	Loss: 0.5831	Accuracy: 72.92%
Training [70%]	Loss: 0.5839	Accuracy: 72.92%
Training [73%]	Loss: 0.5835	Accuracy: 72.92%
Training [77%]	Loss: 0.5839	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [83%]	Loss: 0.5842	Accuracy: 72.92%
Training [87%]	Loss: 0.5839	Accuracy: 72.92%
Training [90%]	Loss: 0.5839	Accuracy: 72.92%
Training [93%]	Loss: 0.5842	Accuracy: 72.92%
Training [97%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5842	Accuracy: 72.92%

Time taken: 626.2813708782196



Performance on test data:  
 Loss: 0.5752  
 Accuracy: 73.91%



Time taken: 626.2813708782196

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr0.1_optimizerAdam</b>	626.281371	0.739056	0.739056	1.0	0.849951

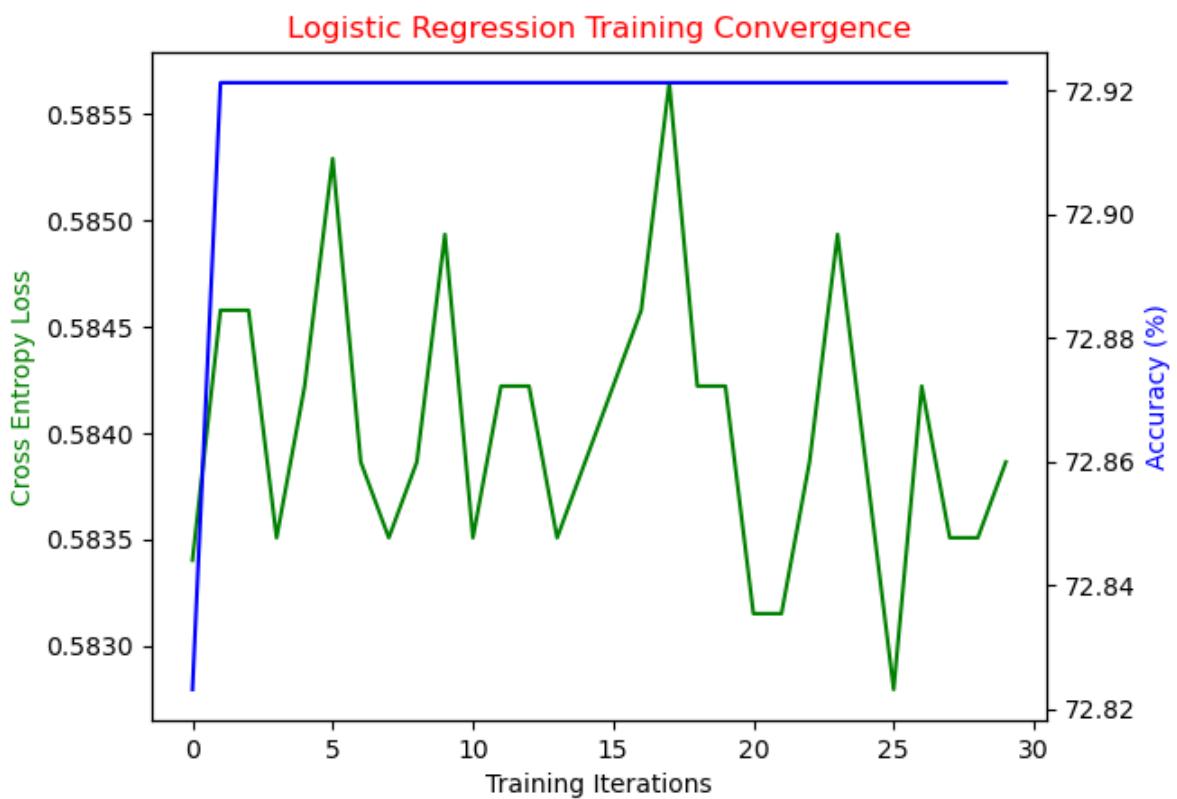
Data Stored Successfully

Training with batch size: 32, epochs: 30, learning rate: 1, optimizer: SGD

Current: 59/90

Training [3%]	Loss: 0.5834	Accuracy: 72.82%
Training [7%]	Loss: 0.5846	Accuracy: 72.92%
Training [10%]	Loss: 0.5846	Accuracy: 72.92%
Training [13%]	Loss: 0.5835	Accuracy: 72.92%
Training [17%]	Loss: 0.5842	Accuracy: 72.92%
Training [20%]	Loss: 0.5853	Accuracy: 72.92%
Training [23%]	Loss: 0.5839	Accuracy: 72.92%
Training [27%]	Loss: 0.5835	Accuracy: 72.92%
Training [30%]	Loss: 0.5839	Accuracy: 72.92%
Training [33%]	Loss: 0.5849	Accuracy: 72.92%
Training [37%]	Loss: 0.5835	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [43%]	Loss: 0.5842	Accuracy: 72.92%
Training [47%]	Loss: 0.5835	Accuracy: 72.92%
Training [50%]	Loss: 0.5839	Accuracy: 72.92%
Training [53%]	Loss: 0.5842	Accuracy: 72.92%
Training [57%]	Loss: 0.5846	Accuracy: 72.92%
Training [60%]	Loss: 0.5856	Accuracy: 72.92%
Training [63%]	Loss: 0.5842	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5831	Accuracy: 72.92%
Training [73%]	Loss: 0.5831	Accuracy: 72.92%
Training [77%]	Loss: 0.5839	Accuracy: 72.92%
Training [80%]	Loss: 0.5849	Accuracy: 72.92%
Training [83%]	Loss: 0.5839	Accuracy: 72.92%
Training [87%]	Loss: 0.5828	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [93%]	Loss: 0.5835	Accuracy: 72.92%
Training [97%]	Loss: 0.5835	Accuracy: 72.92%
Training [100%]	Loss: 0.5839	Accuracy: 72.92%

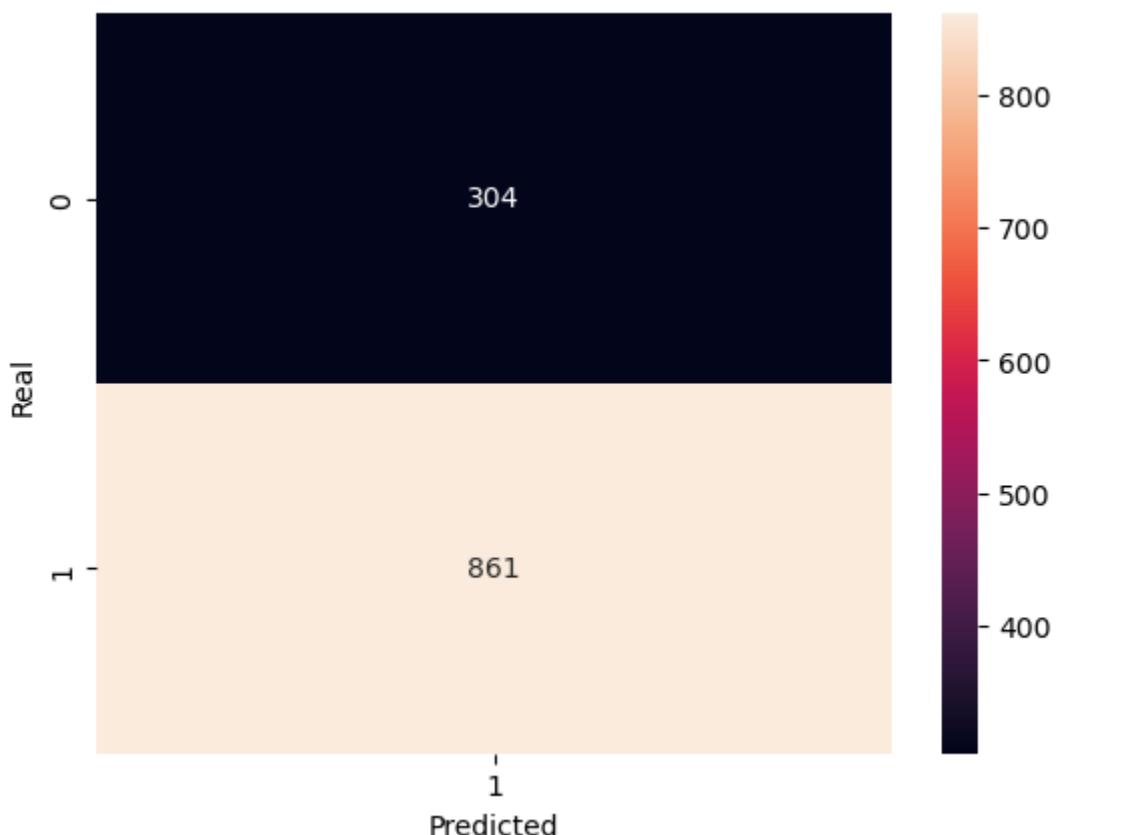
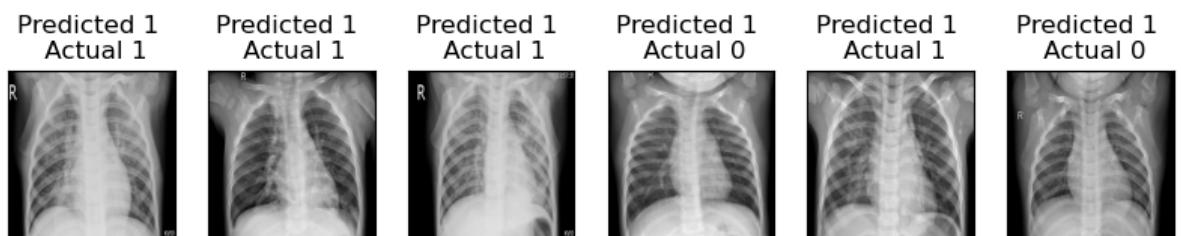
Time taken: 567.8547921180725



Performance on test data:

Loss: 0.5752

Accuracy: 73.91%



```
Time taken: 567.8547921180725
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:
```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr1_optimizerSGD</b>	567.854792	0.739056	0.739056	1.0	0.849951

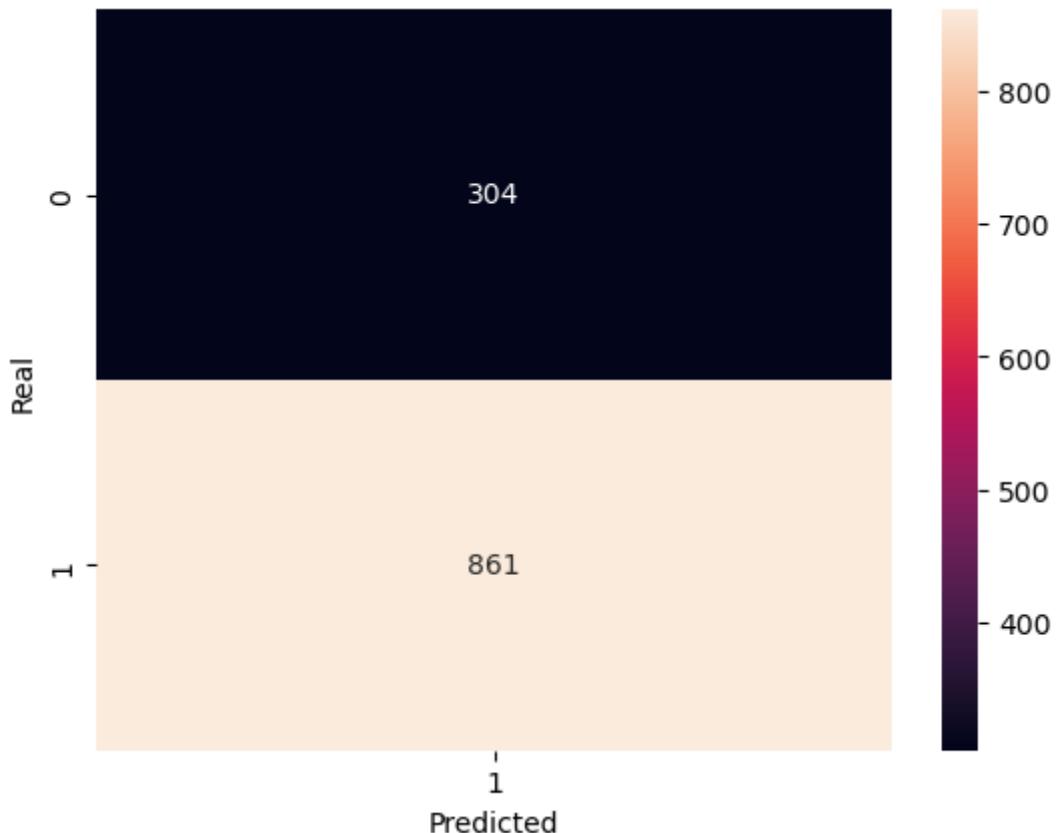
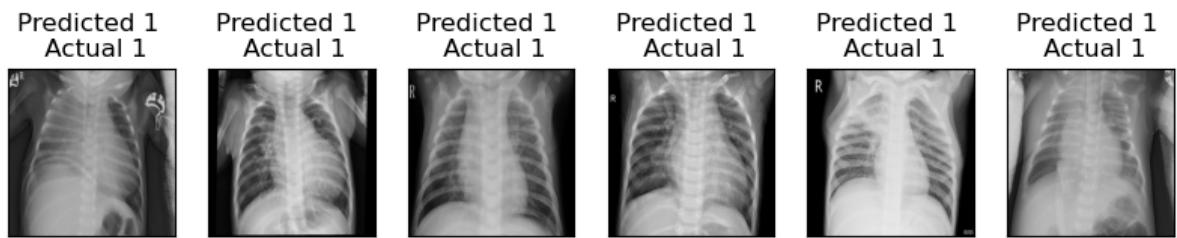
Data Stored Successfully  
 Training with batch size: 32, epochs: 30, learning rate: 1, optimizer: Adam  
 Current: 60/90

Training [3%]	Loss: 0.5841	Accuracy: 72.92%
Training [7%]	Loss: 0.5842	Accuracy: 72.92%
Training [10%]	Loss: 0.5835	Accuracy: 72.92%
Training [13%]	Loss: 0.5839	Accuracy: 72.92%
Training [17%]	Loss: 0.5831	Accuracy: 72.92%
Training [20%]	Loss: 0.5835	Accuracy: 72.92%
Training [23%]	Loss: 0.5846	Accuracy: 72.92%
Training [27%]	Loss: 0.5853	Accuracy: 72.92%
Training [30%]	Loss: 0.5839	Accuracy: 72.92%
Training [33%]	Loss: 0.5839	Accuracy: 72.92%
Training [37%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5846	Accuracy: 72.92%
Training [43%]	Loss: 0.5835	Accuracy: 72.92%
Training [47%]	Loss: 0.5846	Accuracy: 72.92%
Training [50%]	Loss: 0.5831	Accuracy: 72.92%
Training [53%]	Loss: 0.5835	Accuracy: 72.92%
Training [57%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5839	Accuracy: 72.92%
Training [67%]	Loss: 0.5846	Accuracy: 72.92%
Training [70%]	Loss: 0.5835	Accuracy: 72.92%
Training [73%]	Loss: 0.5842	Accuracy: 72.92%
Training [77%]	Loss: 0.5846	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [83%]	Loss: 0.5831	Accuracy: 72.92%
Training [87%]	Loss: 0.5835	Accuracy: 72.92%
Training [90%]	Loss: 0.5835	Accuracy: 72.92%
Training [93%]	Loss: 0.5842	Accuracy: 72.92%
Training [97%]	Loss: 0.5853	Accuracy: 72.92%
Training [100%]	Loss: 0.5835	Accuracy: 72.92%

Time taken: 638.1714425086975



Performance on test data:  
 Loss: 0.5751  
 Accuracy: 73.91%



Time taken: 638.1714425086975

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch32_epochs30_lr1_optimizerAdam</b>	638.171443	0.739056	0.739056	1.0	0.849951

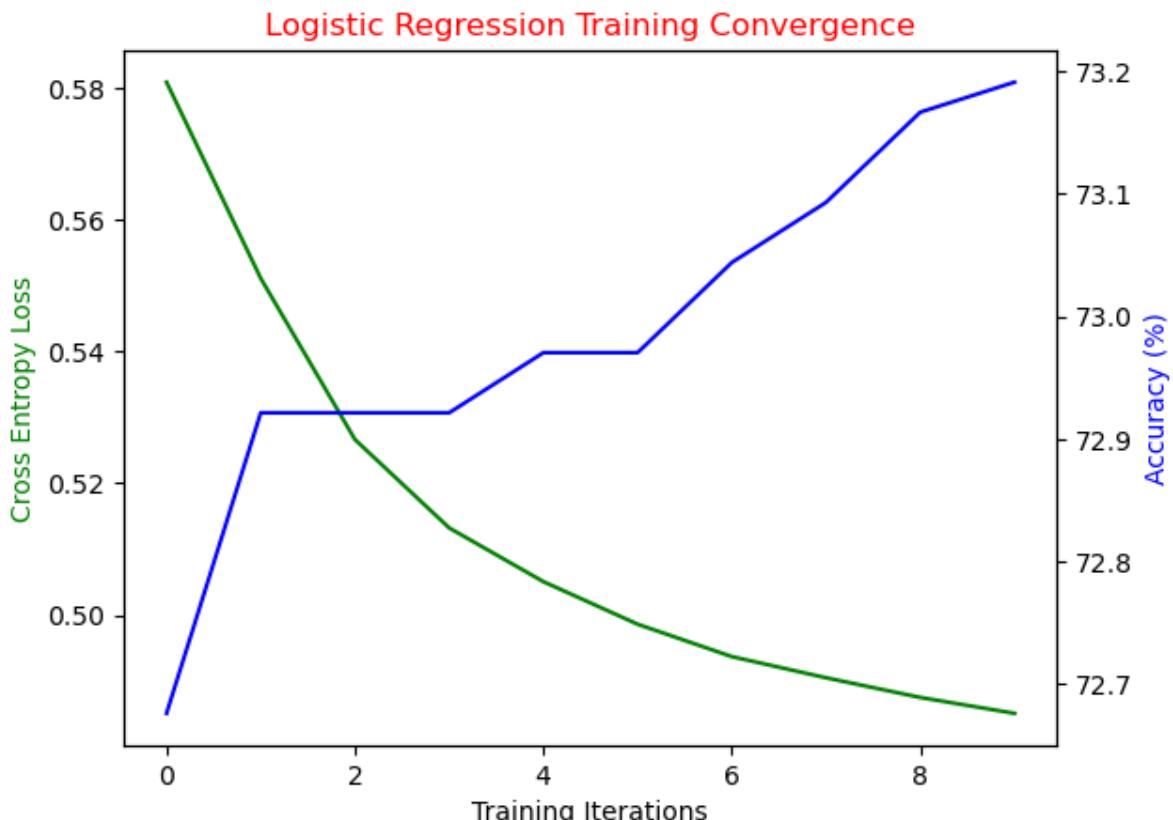
Data Stored Successfully

Training with batch size: 64, epochs: 10, learning rate: 0.0001, optimizer: SGD

Current: 61/90

Training [10%]	Loss: 0.5810	Accuracy: 72.68%
Training [20%]	Loss: 0.5511	Accuracy: 72.92%
Training [30%]	Loss: 0.5266	Accuracy: 72.92%
Training [40%]	Loss: 0.5132	Accuracy: 72.92%
Training [50%]	Loss: 0.5051	Accuracy: 72.97%
Training [60%]	Loss: 0.4986	Accuracy: 72.97%
Training [70%]	Loss: 0.4937	Accuracy: 73.04%
Training [80%]	Loss: 0.4904	Accuracy: 73.09%
Training [90%]	Loss: 0.4875	Accuracy: 73.17%
Training [100%]	Loss: 0.4850	Accuracy: 73.19%

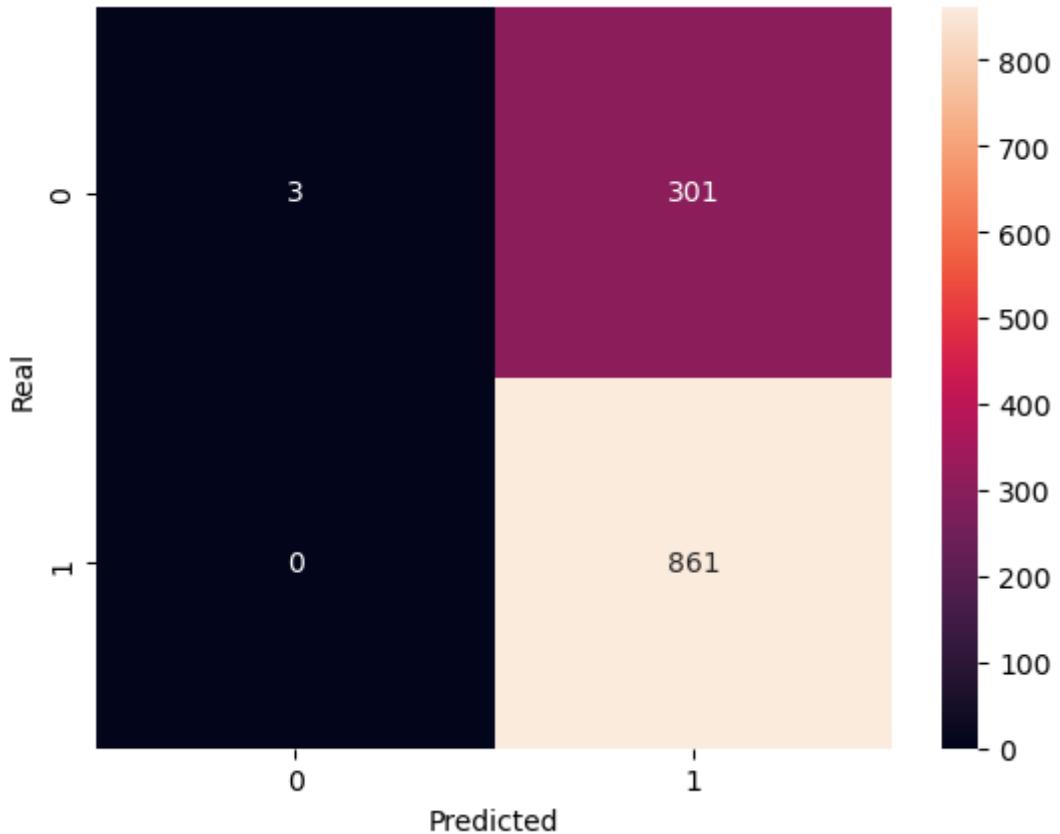
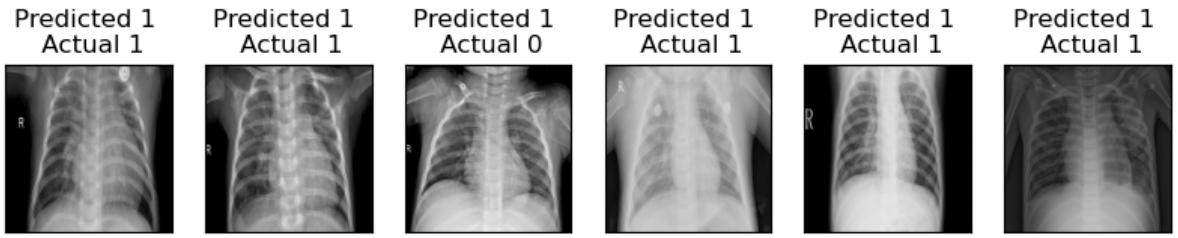
Time taken: 203.2997224330902



Performance on test data:

Loss: 0.4745

Accuracy: 74.16%



Time taken: 203.2997224330902

Test size: 1165

Total Accuracy: 0.7416309012875536

Total Precision: 0.7409638554216867

Total Recall: 1.0

Total F1 Score: 0.8512110726643599

Classification Report:

	precision	recall	f1-score	support
0	1.00	0.01	0.02	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.87	0.50	0.44	1165
weighted avg	0.81	0.74	0.63	1165

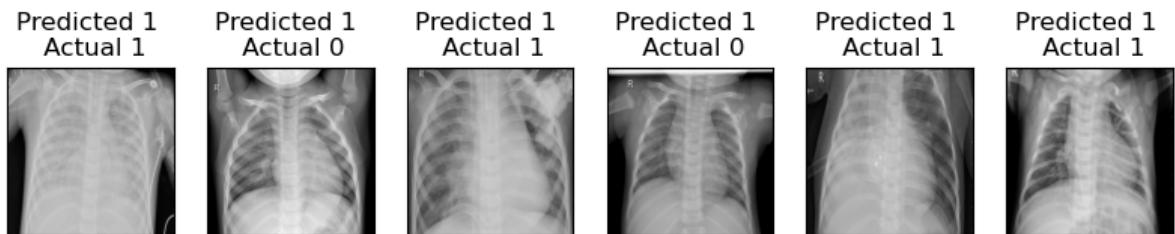
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch64_epochs10_lr0.0001_optimizerSGD	203.299722	0.741631	0.740964	1.0	0.851211

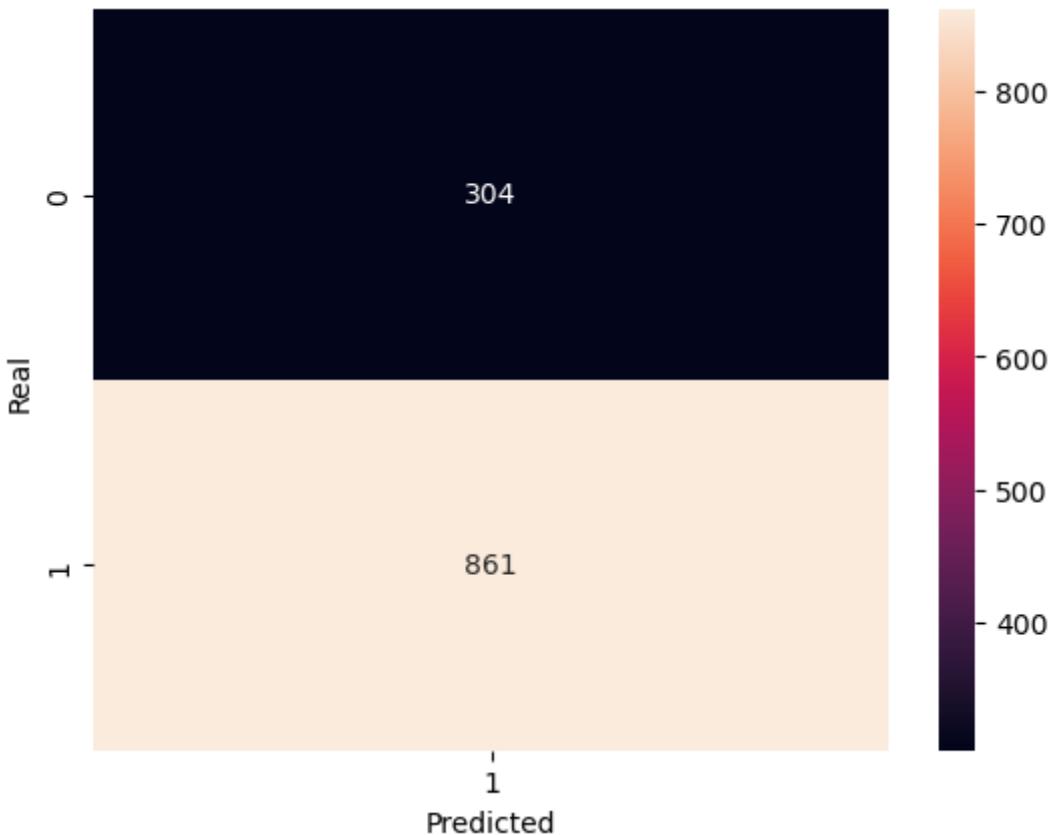
Data Stored Successfully  
Training with batch size: 64, epochs: 10, learning rate: 0.0001, optimizer: Adam  
Current: 62/90  
Training [10%] Loss: 0.5861 Accuracy: 72.33%  
Training [20%] Loss: 0.5841 Accuracy: 72.92%  
Training [30%] Loss: 0.5836 Accuracy: 72.92%  
Training [40%] Loss: 0.5841 Accuracy: 72.92%  
Training [50%] Loss: 0.5840 Accuracy: 72.92%  
Training [60%] Loss: 0.5846 Accuracy: 72.92%  
Training [70%] Loss: 0.5844 Accuracy: 72.92%  
Training [80%] Loss: 0.5841 Accuracy: 72.92%  
Training [90%] Loss: 0.5844 Accuracy: 72.92%  
Training [100%] Loss: 0.5838 Accuracy: 72.92%  
Time taken: 204.6422119140625



Performance on test data:

Loss: 0.5747  
Accuracy: 73.91%





Time taken: 204.6422119140625

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> model_batch64_epochs10_lr0.0001_optimizerAdam	204.642212	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

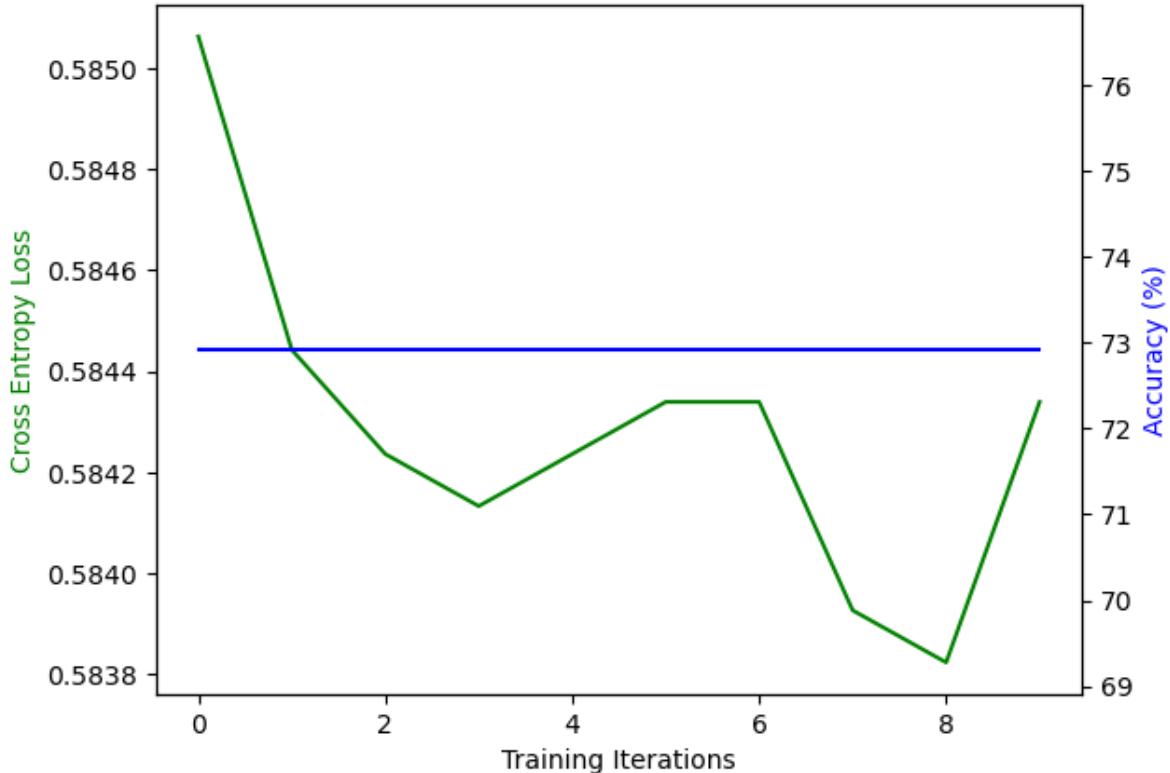
Training with batch size: 64, epochs: 10, learning rate: 0.001, optimizer: SGD

Current: 63/90

Training [10%]	Loss: 0.5851	Accuracy: 72.92%
Training [20%]	Loss: 0.5844	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5843	Accuracy: 72.92%
Training [70%]	Loss: 0.5843	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [90%]	Loss: 0.5838	Accuracy: 72.92%
Training [100%]	Loss: 0.5843	Accuracy: 72.92%

Time taken: 202.7689220905304

Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

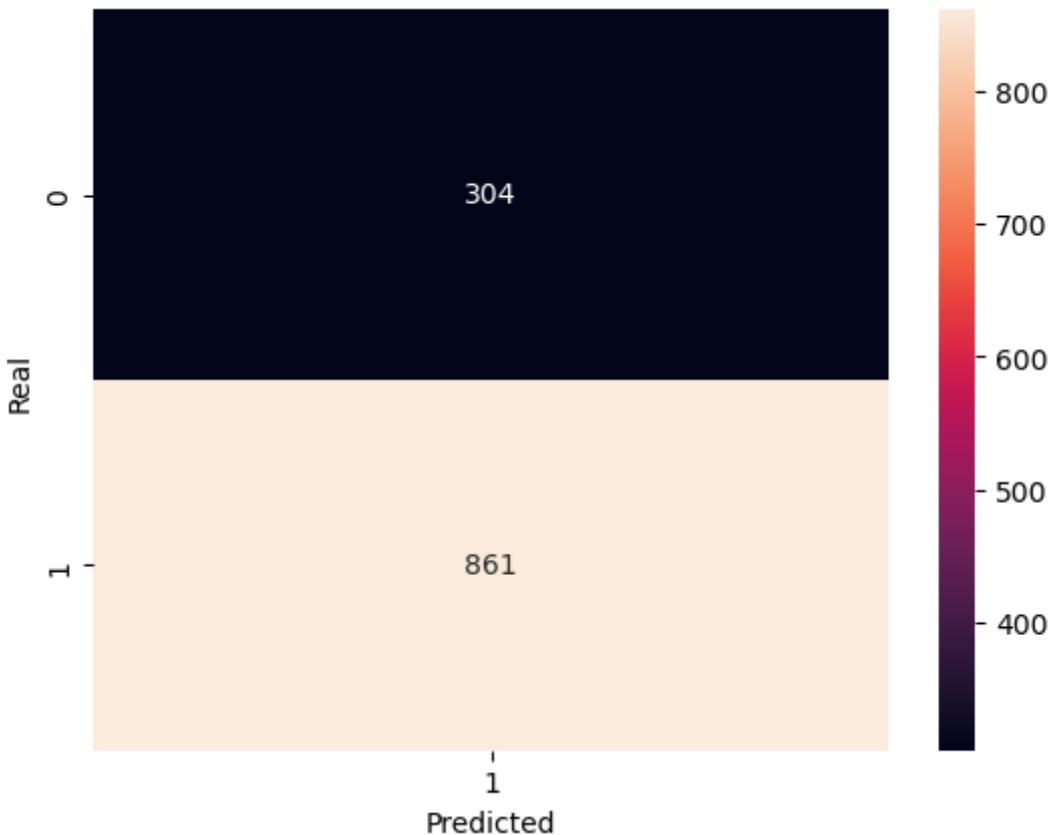


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 202.7689220905304

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

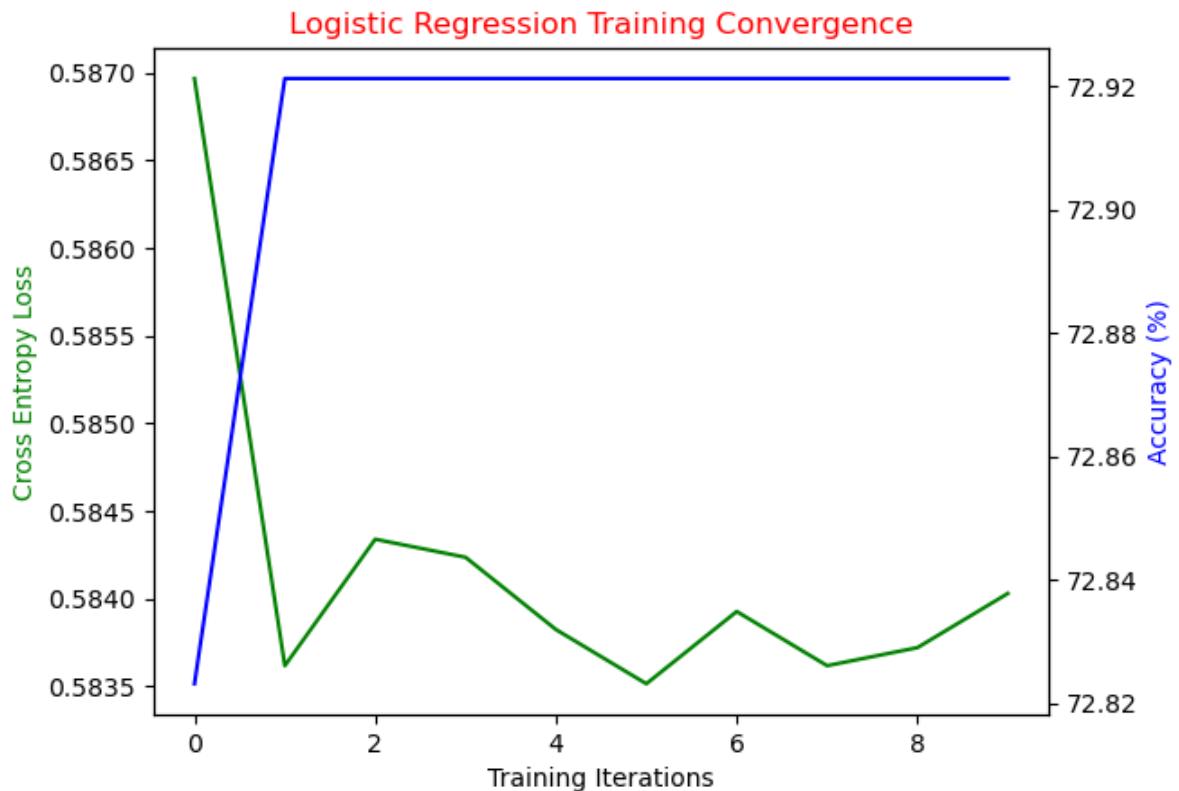
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time Accuracy Precision Recall F1 score

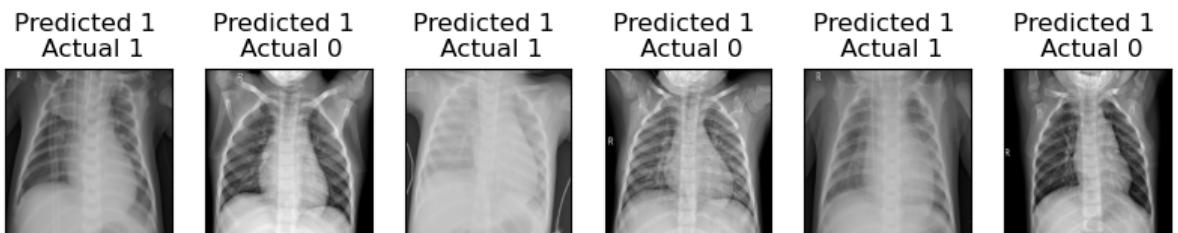
Logistic Regression	Time	Accuracy	Precision	Recall	F1 score
model_batch64_epochs10_lr0.001_optimizerSGD	202.768922	0.739056	0.739056	1.0	0.849951

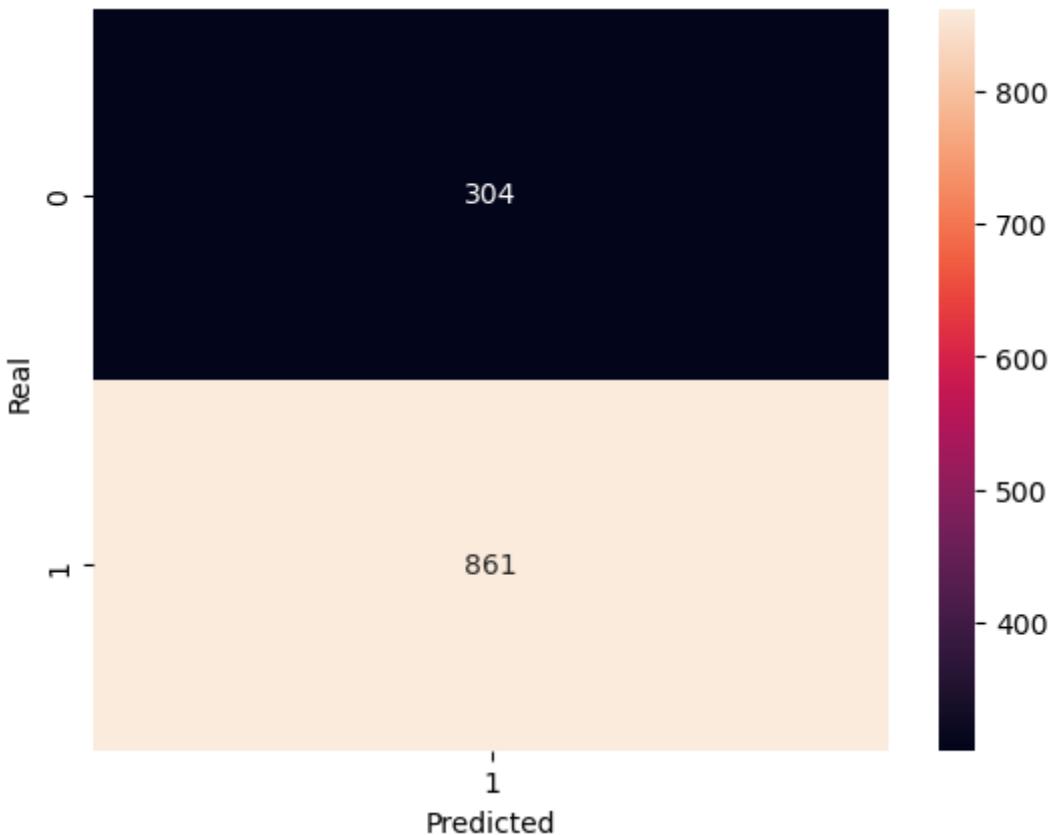
Data Stored Successfully  
Training with batch size: 64, epochs: 10, learning rate: 0.001, optimizer: Adam  
Current: 64/90  
Training [10%] Loss: 0.5870 Accuracy: 72.82%  
Training [20%] Loss: 0.5836 Accuracy: 72.92%  
Training [30%] Loss: 0.5843 Accuracy: 72.92%  
Training [40%] Loss: 0.5842 Accuracy: 72.92%  
Training [50%] Loss: 0.5838 Accuracy: 72.92%  
Training [60%] Loss: 0.5835 Accuracy: 72.92%  
Training [70%] Loss: 0.5839 Accuracy: 72.92%  
Training [80%] Loss: 0.5836 Accuracy: 72.92%  
Training [90%] Loss: 0.5837 Accuracy: 72.92%  
Training [100%] Loss: 0.5840 Accuracy: 72.92%  
Time taken: 203.2465853691101



Performance on test data:

Loss: 0.5747  
Accuracy: 73.91%





Time taken: 203.2465853691101

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

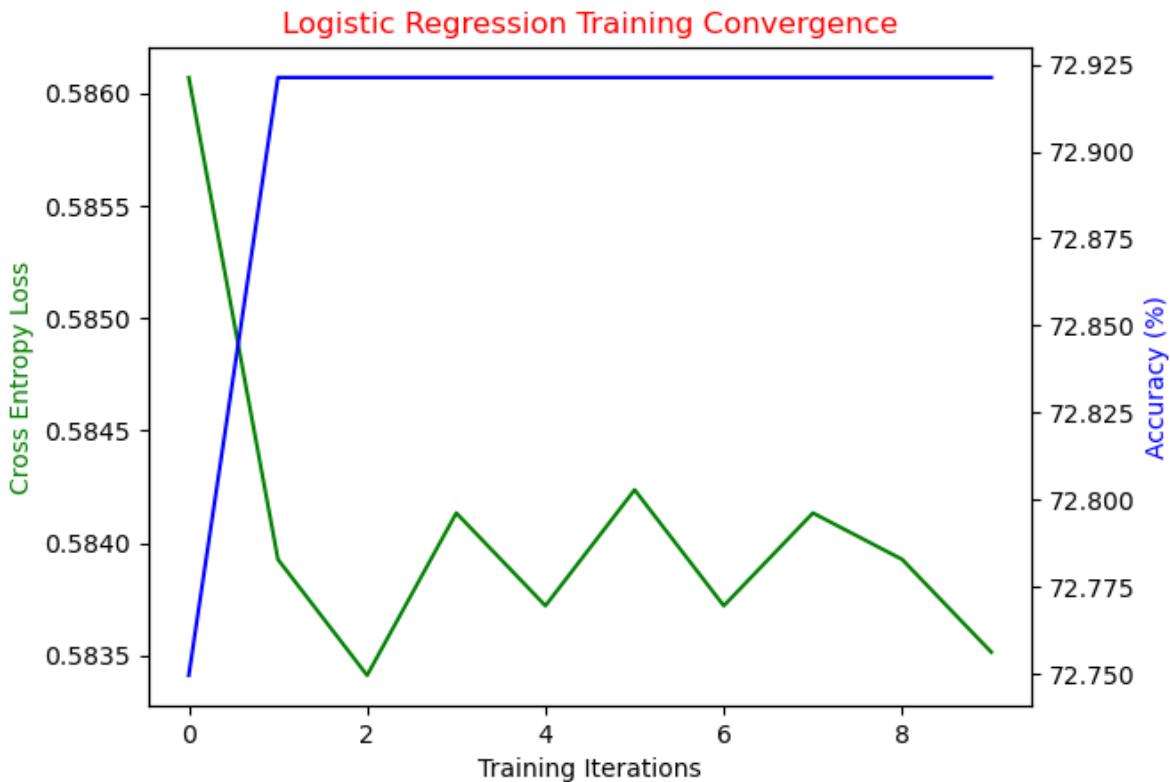
Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs10_lr0.001_optimizerAdam</b>	203.246585	0.739056	0.739056	1.0	0.849951

```
Data Stored Successfully
Training with batch size: 64, epochs: 10, learning rate: 0.01, optimizer: SGD
Current: 65/90
Training [10%] Loss: 0.5861 Accuracy: 72.75%
Training [20%] Loss: 0.5839 Accuracy: 72.92%
Training [30%] Loss: 0.5834 Accuracy: 72.92%
Training [40%] Loss: 0.5841 Accuracy: 72.92%
Training [50%] Loss: 0.5837 Accuracy: 72.92%
Training [60%] Loss: 0.5842 Accuracy: 72.92%
Training [70%] Loss: 0.5837 Accuracy: 72.92%
Training [80%] Loss: 0.5841 Accuracy: 72.92%
Training [90%] Loss: 0.5839 Accuracy: 72.92%
Training [100%] Loss: 0.5835 Accuracy: 72.92%
Time taken: 199.65758228302002
```



### Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

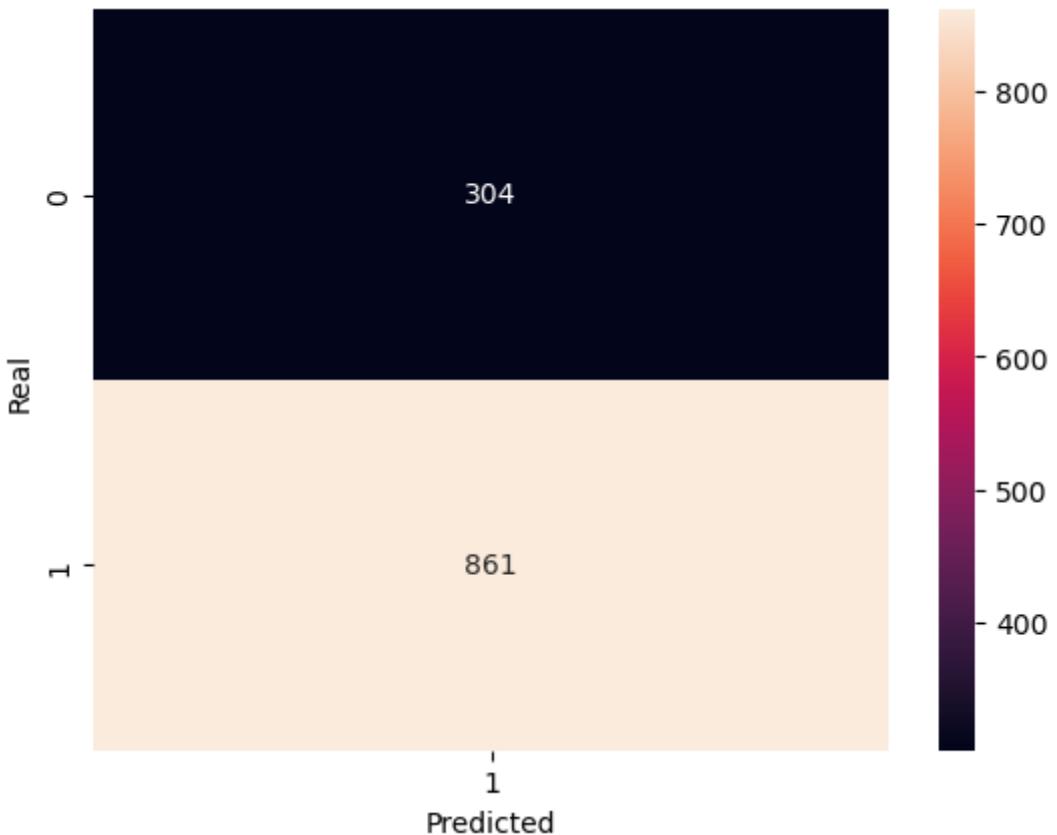


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 199.65758228302002

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

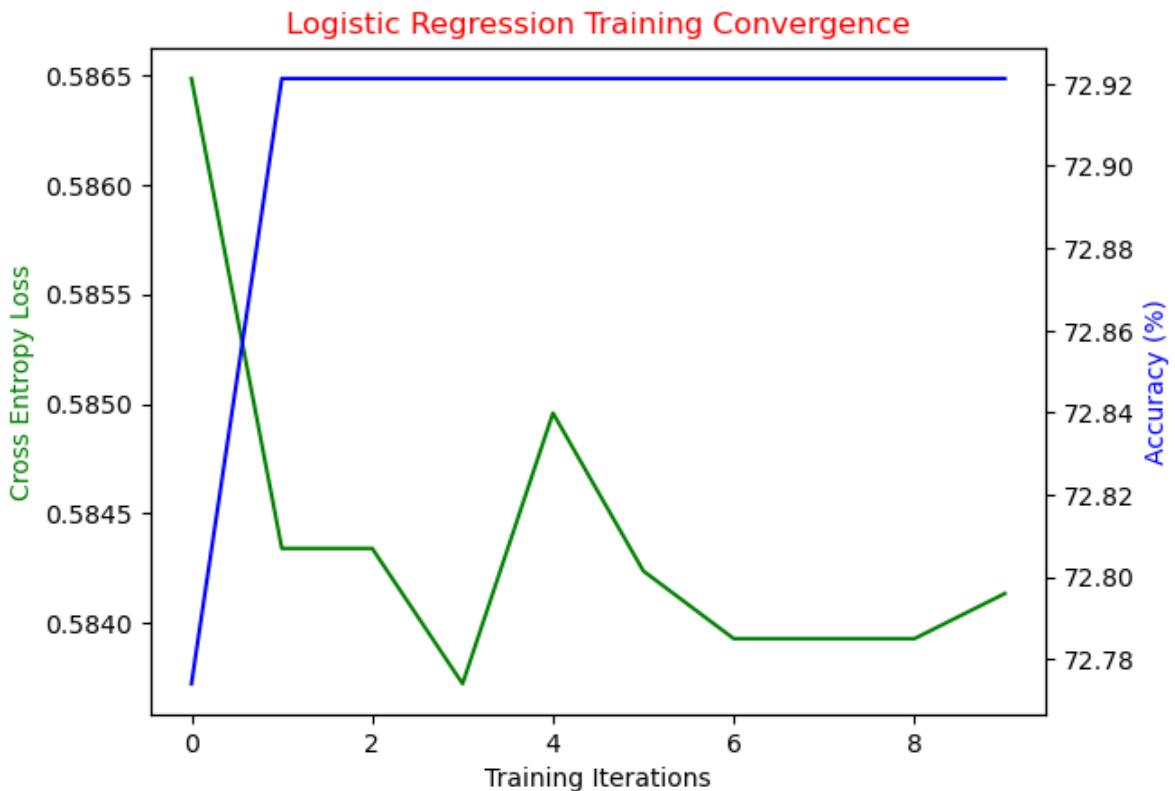
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
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1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

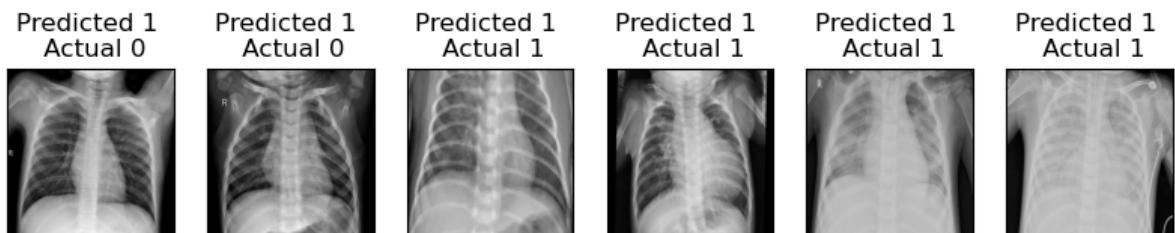
Logistic Regression model_batch64_epochs10_lr0.01_optimizerSGD	199.657582	0.739056	0.739056	1.0	0.849951
---	------------	----------	----------	-----	----------

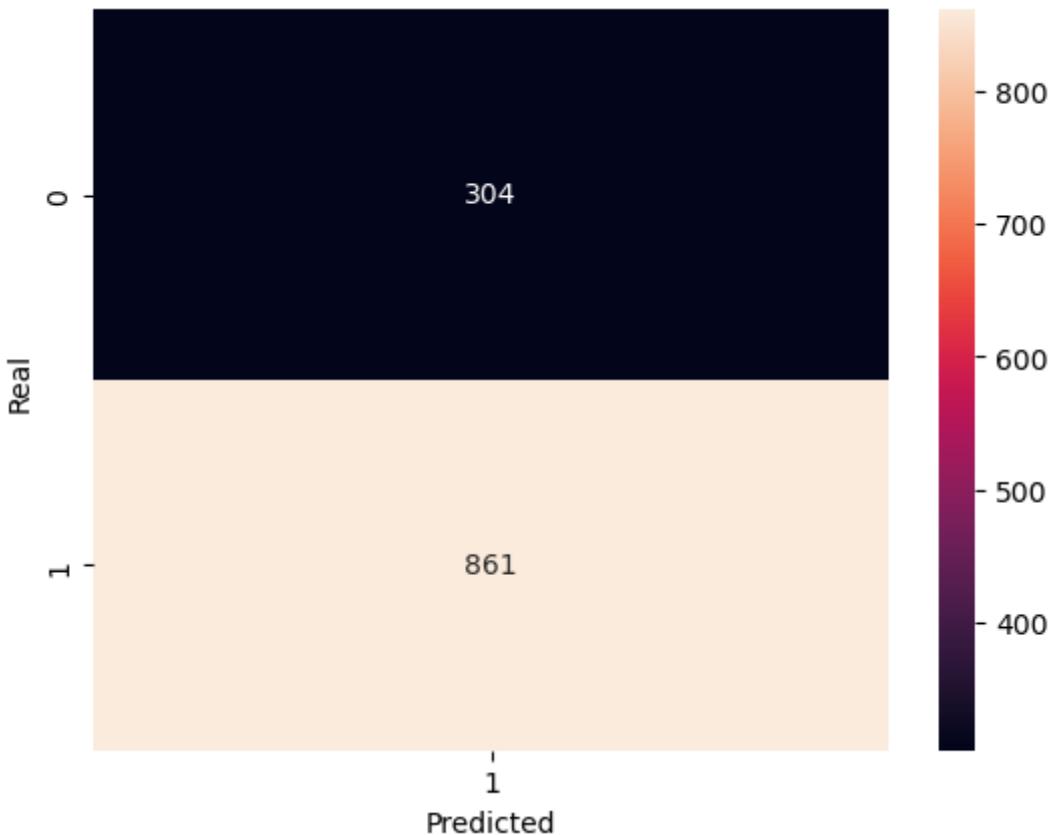
Data Stored Successfully  
Training with batch size: 64, epochs: 10, learning rate: 0.01, optimizer: Adam  
Current: 66/90  
Training [10%] Loss: 0.5865 Accuracy: 72.77%  
Training [20%] Loss: 0.5843 Accuracy: 72.92%  
Training [30%] Loss: 0.5843 Accuracy: 72.92%  
Training [40%] Loss: 0.5837 Accuracy: 72.92%  
Training [50%] Loss: 0.5850 Accuracy: 72.92%  
Training [60%] Loss: 0.5842 Accuracy: 72.92%  
Training [70%] Loss: 0.5839 Accuracy: 72.92%  
Training [80%] Loss: 0.5839 Accuracy: 72.92%  
Training [90%] Loss: 0.5839 Accuracy: 72.92%  
Training [100%] Loss: 0.5841 Accuracy: 72.92%  
Time taken: 201.059876203537



Performance on test data:

Loss: 0.5747  
Accuracy: 73.91%





Time taken: 201.059876203537

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

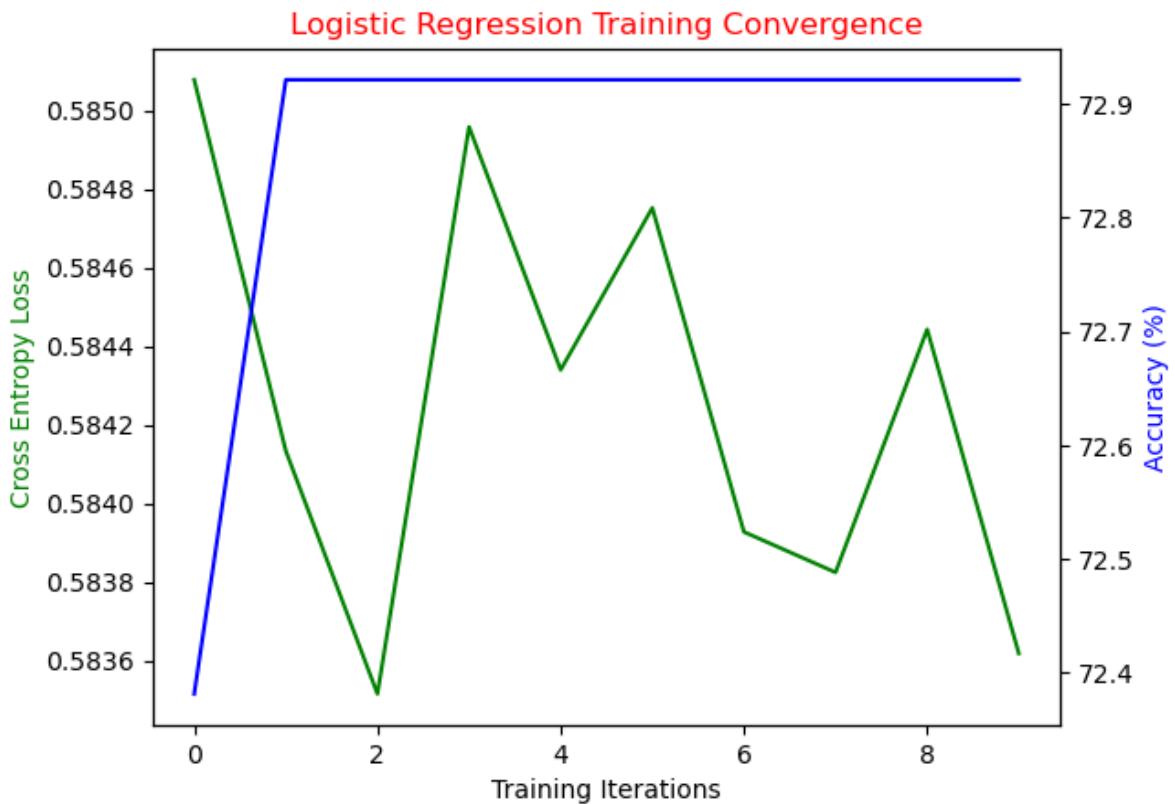
Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

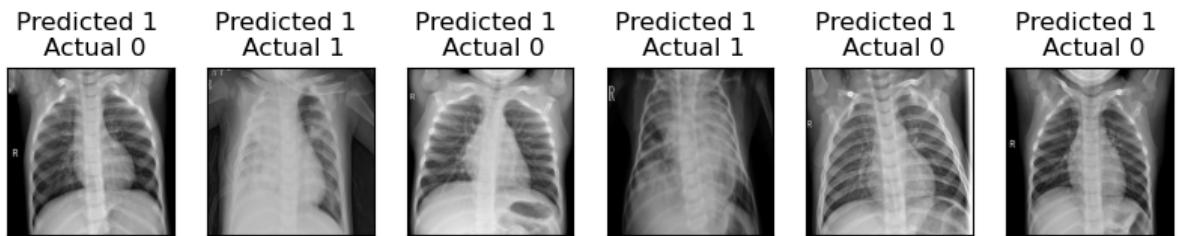
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch64_epochs10_lr0.01_optimizerAdam	201.059876	0.739056	0.739056	1.0	0.849951

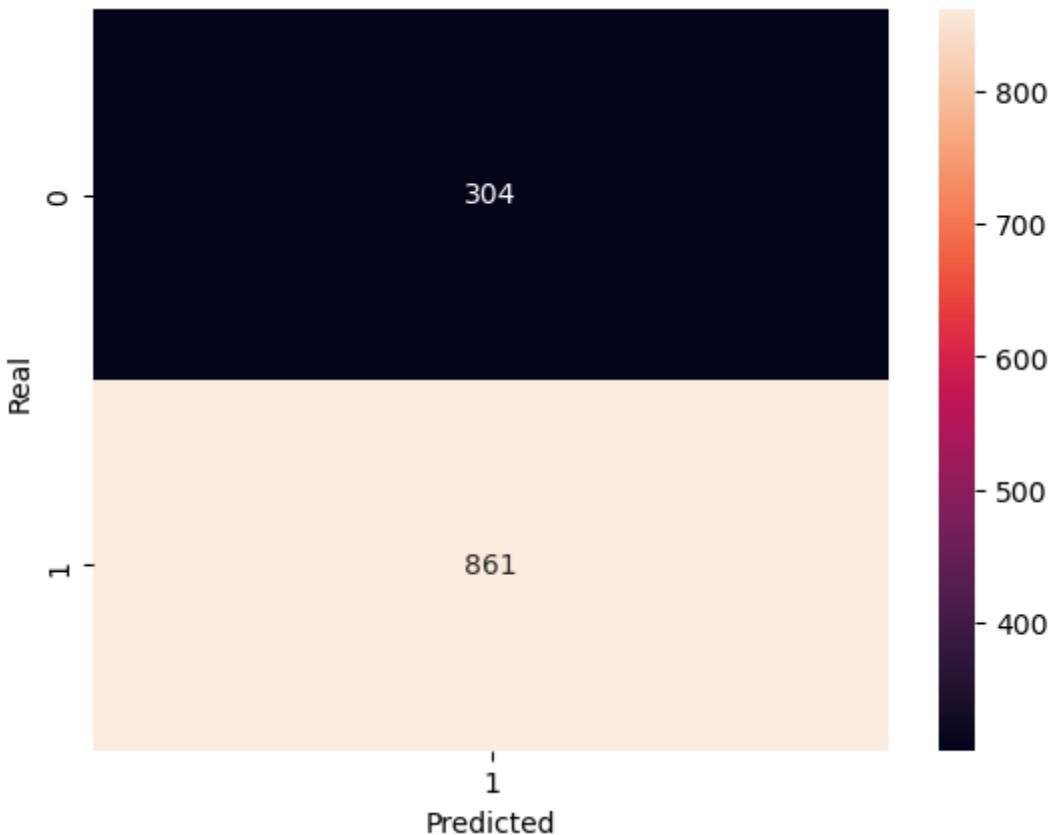
Data Stored Successfully  
Training with batch size: 64, epochs: 10, learning rate: 0.1, optimizer: SGD  
Current: 67/90  
Training [10%] Loss: 0.5851 Accuracy: 72.38%  
Training [20%] Loss: 0.5841 Accuracy: 72.92%  
Training [30%] Loss: 0.5835 Accuracy: 72.92%  
Training [40%] Loss: 0.5850 Accuracy: 72.92%  
Training [50%] Loss: 0.5843 Accuracy: 72.92%  
Training [60%] Loss: 0.5848 Accuracy: 72.92%  
Training [70%] Loss: 0.5839 Accuracy: 72.92%  
Training [80%] Loss: 0.5838 Accuracy: 72.92%  
Training [90%] Loss: 0.5844 Accuracy: 72.92%  
Training [100%] Loss: 0.5836 Accuracy: 72.92%  
Time taken: 198.21016931533813



Performance on test data:

Loss: 0.5747  
Accuracy: 73.91%





Time taken: 198.21016931533813

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

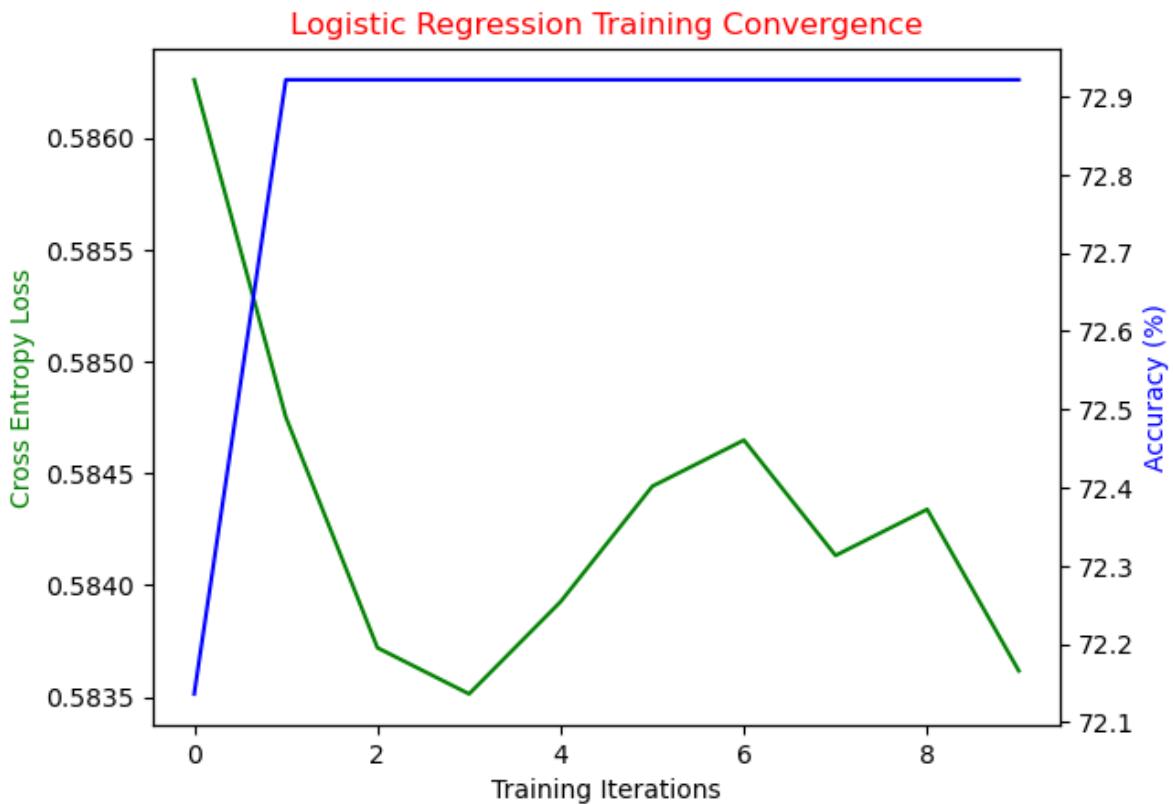
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch64_epochs10_lr0.1_optimizerSGD	198.210169	0.739056	0.739056	1.0	0.849951
--	------------	----------	----------	-----	----------

```
Data Stored Successfully
Training with batch size: 64, epochs: 10, learning rate: 0.1, optimizer: Adam
Current: 68/90
Training [10%] Loss: 0.5863 Accuracy: 72.14%
Training [20%] Loss: 0.5848 Accuracy: 72.92%
Training [30%] Loss: 0.5837 Accuracy: 72.92%
Training [40%] Loss: 0.5835 Accuracy: 72.92%
Training [50%] Loss: 0.5839 Accuracy: 72.92%
Training [60%] Loss: 0.5844 Accuracy: 72.92%
Training [70%] Loss: 0.5846 Accuracy: 72.92%
Training [80%] Loss: 0.5841 Accuracy: 72.92%
Training [90%] Loss: 0.5843 Accuracy: 72.92%
Training [100%] Loss: 0.5836 Accuracy: 72.92%
Time taken: 200.74035692214966
```



### Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

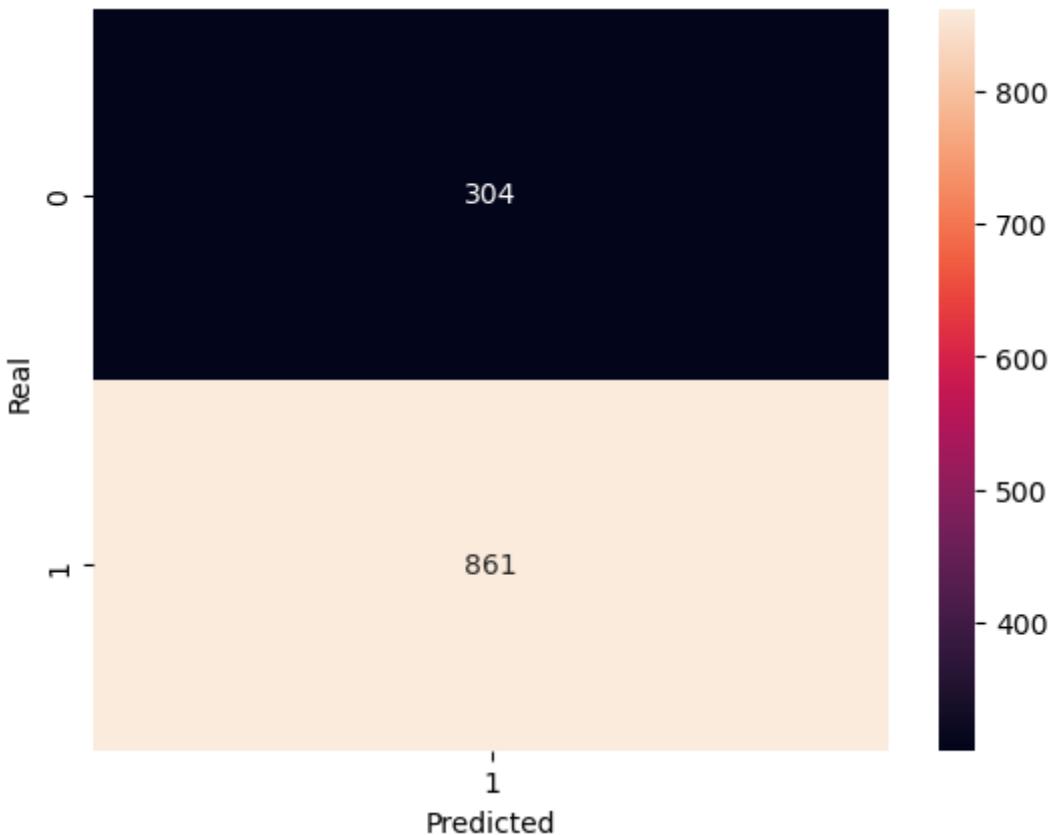


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 200.74035692214966

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

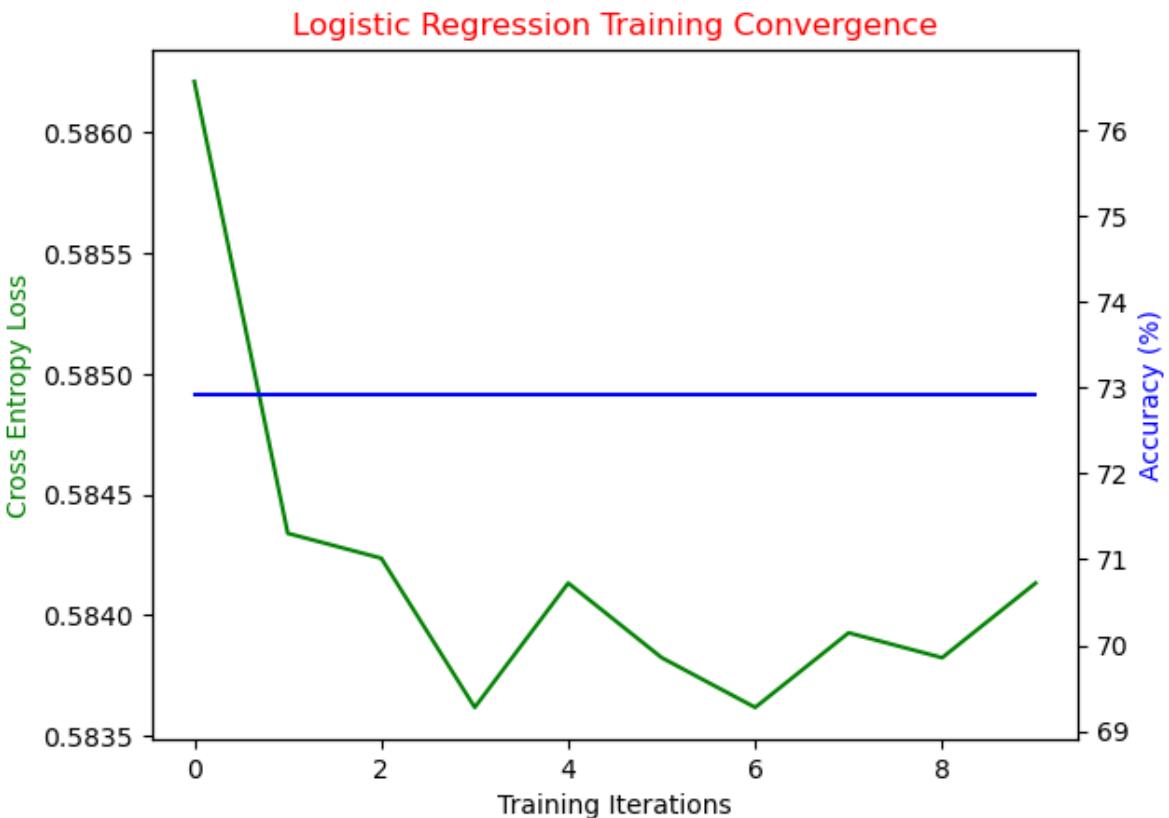
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch64_epochs10_lr0.1_optimizerAdam	200.740357	0.739056	0.739056	1.0	0.849951
---	------------	----------	----------	-----	----------

```
Data Stored Successfully
Training with batch size: 64, epochs: 10, learning rate: 1, optimizer: SGD
Current: 69/90
Training [10%] Loss: 0.5862 Accuracy: 72.92%
Training [20%] Loss: 0.5843 Accuracy: 72.92%
Training [30%] Loss: 0.5842 Accuracy: 72.92%
Training [40%] Loss: 0.5836 Accuracy: 72.92%
Training [50%] Loss: 0.5841 Accuracy: 72.92%
Training [60%] Loss: 0.5838 Accuracy: 72.92%
Training [70%] Loss: 0.5836 Accuracy: 72.92%
Training [80%] Loss: 0.5839 Accuracy: 72.92%
Training [90%] Loss: 0.5838 Accuracy: 72.92%
Training [100%] Loss: 0.5841 Accuracy: 72.92%
Time taken: 198.99372816085815
```



#### Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

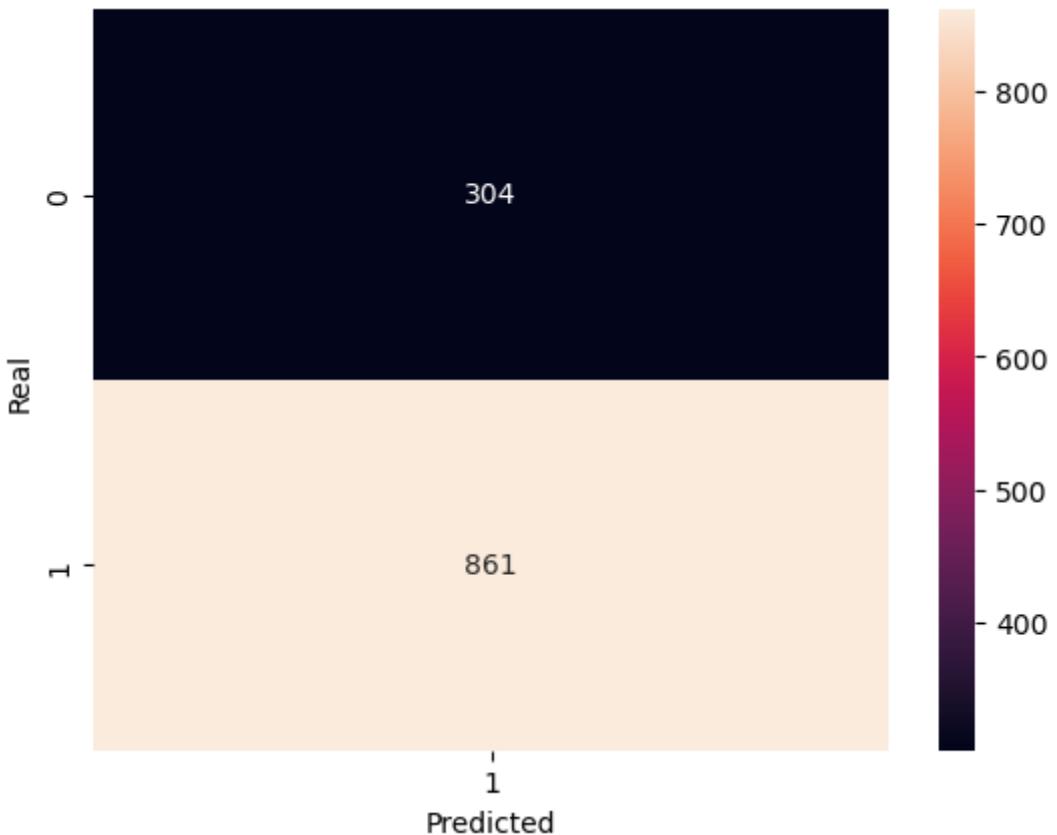


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 198.99372816085815

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

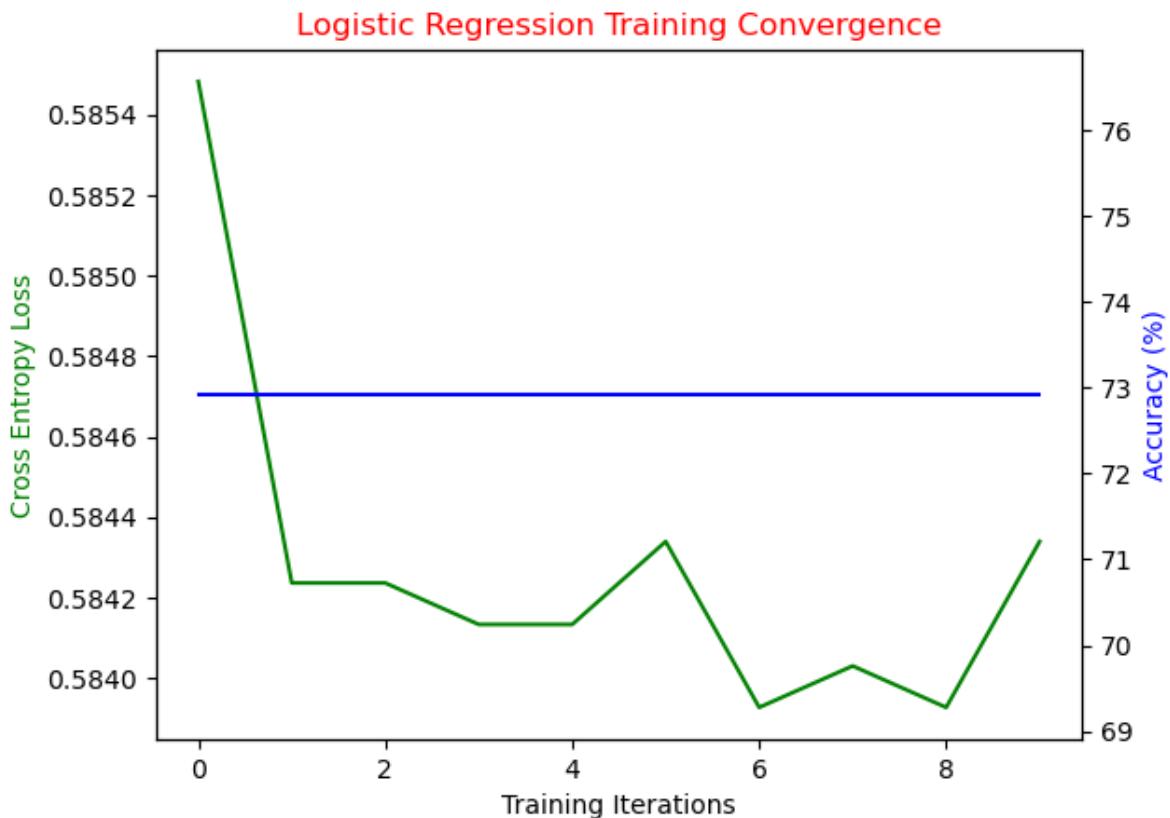
	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time Accuracy Precision Recall F1 score

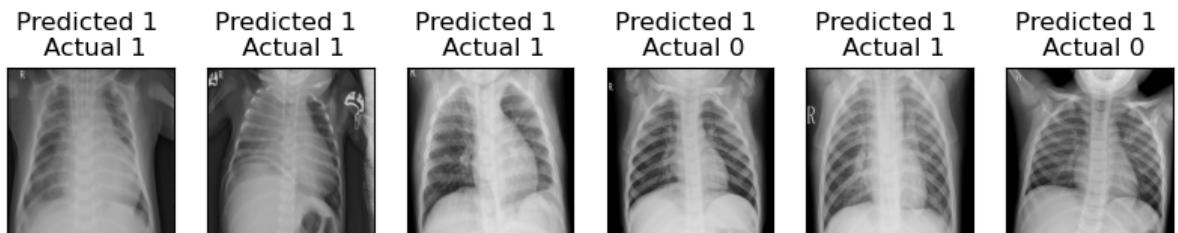
Logistic Regression model_batch64_epochs10_lr1_optimizerSGD	Time	Accuracy	Precision	Recall	F1 score
	198.993728	0.739056	0.739056	1.0	0.849951

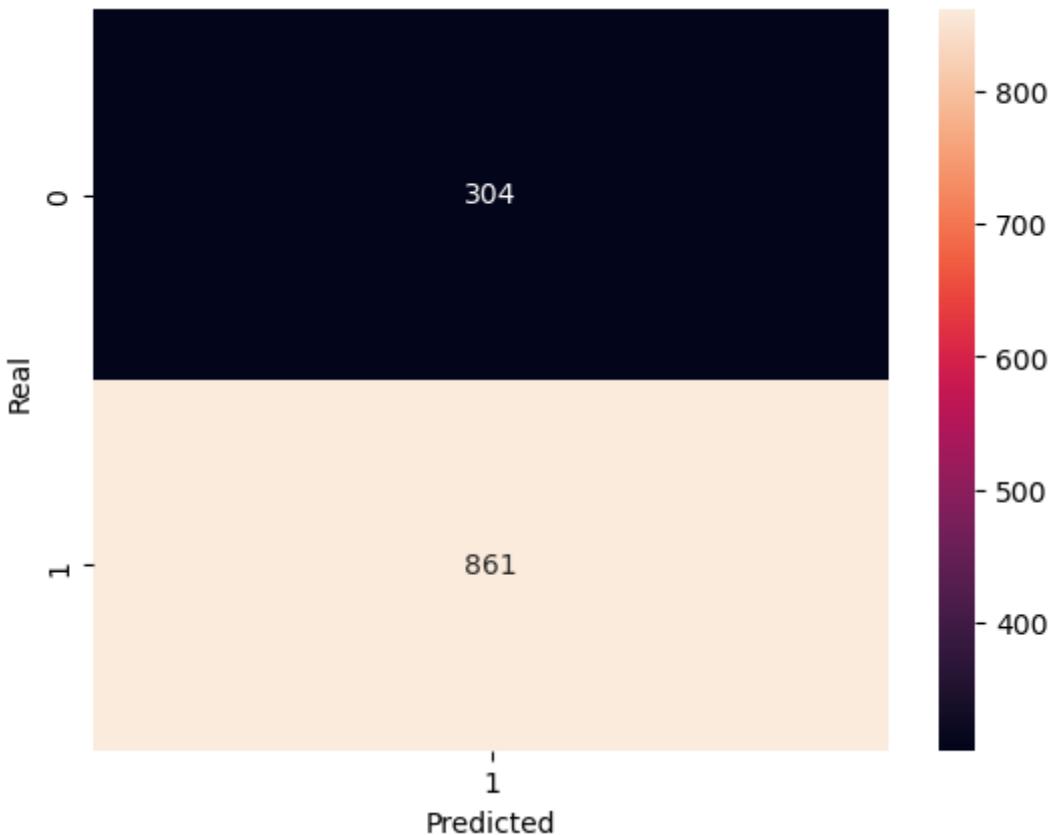
Data Stored Successfully  
Training with batch size: 64, epochs: 10, learning rate: 1, optimizer: Adam  
Current: 70/90  
Training [10%] Loss: 0.5855 Accuracy: 72.92%  
Training [20%] Loss: 0.5842 Accuracy: 72.92%  
Training [30%] Loss: 0.5842 Accuracy: 72.92%  
Training [40%] Loss: 0.5841 Accuracy: 72.92%  
Training [50%] Loss: 0.5841 Accuracy: 72.92%  
Training [60%] Loss: 0.5843 Accuracy: 72.92%  
Training [70%] Loss: 0.5839 Accuracy: 72.92%  
Training [80%] Loss: 0.5840 Accuracy: 72.92%  
Training [90%] Loss: 0.5839 Accuracy: 72.92%  
Training [100%] Loss: 0.5843 Accuracy: 72.92%  
Time taken: 201.24700164794922



Performance on test data:

Loss: 0.5747  
Accuracy: 73.91%





Time taken: 201.24700164794922

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch64_epochs10_lr1_optimizerAdam	201.247002	0.739056	0.739056	1.0	0.849951
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Data Stored Successfully

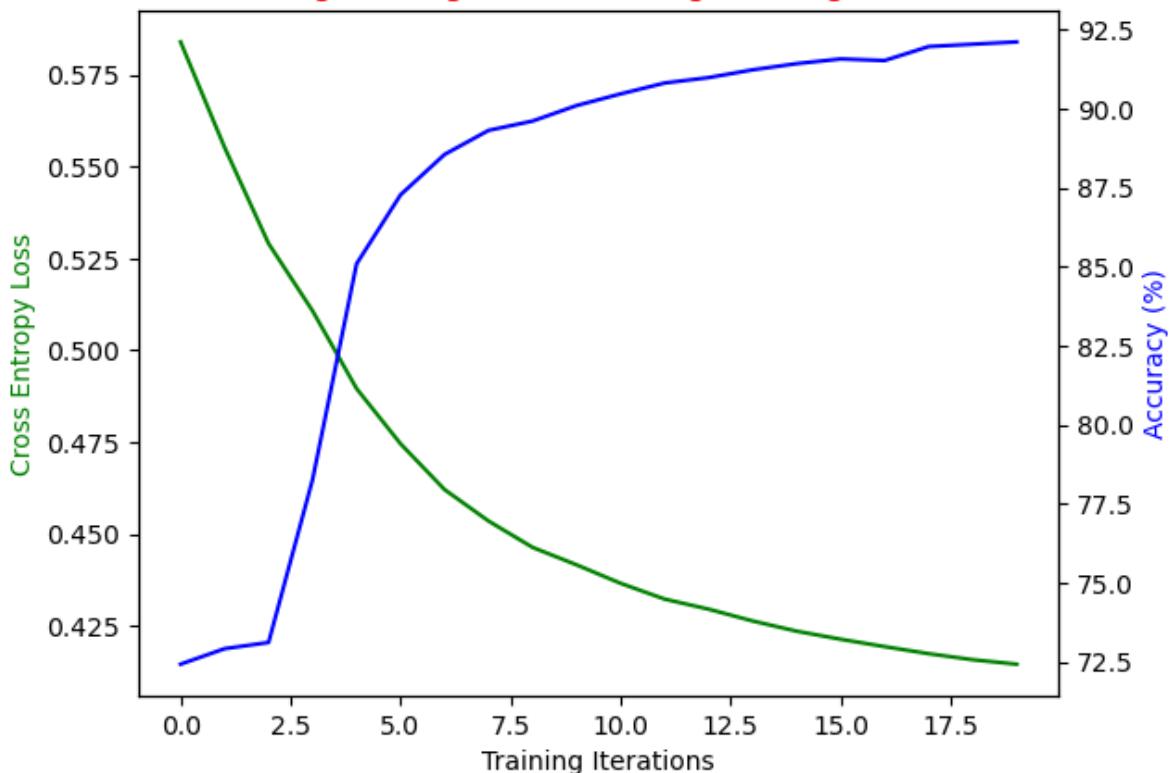
Training with batch size: 64, epochs: 20, learning rate: 0.0001, optimizer: SGD

Current: 71/90

Training [5%]	Loss: 0.5839	Accuracy: 72.43%
Training [10%]	Loss: 0.5552	Accuracy: 72.92%
Training [15%]	Loss: 0.5290	Accuracy: 73.12%
Training [20%]	Loss: 0.5107	Accuracy: 78.27%
Training [25%]	Loss: 0.4896	Accuracy: 85.09%
Training [30%]	Loss: 0.4745	Accuracy: 87.27%
Training [35%]	Loss: 0.4621	Accuracy: 88.55%
Training [40%]	Loss: 0.4535	Accuracy: 89.31%
Training [45%]	Loss: 0.4464	Accuracy: 89.60%
Training [50%]	Loss: 0.4416	Accuracy: 90.09%
Training [55%]	Loss: 0.4366	Accuracy: 90.46%
Training [60%]	Loss: 0.4323	Accuracy: 90.80%
Training [65%]	Loss: 0.4295	Accuracy: 90.97%
Training [70%]	Loss: 0.4263	Accuracy: 91.22%
Training [75%]	Loss: 0.4236	Accuracy: 91.42%
Training [80%]	Loss: 0.4214	Accuracy: 91.56%
Training [85%]	Loss: 0.4194	Accuracy: 91.51%
Training [90%]	Loss: 0.4174	Accuracy: 91.95%
Training [95%]	Loss: 0.4158	Accuracy: 92.03%
Training [100%]	Loss: 0.4146	Accuracy: 92.10%

Time taken: 399.7247004508972

### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.4042

Accuracy: 92.79%

Predicted 1  
Actual 0



Predicted 0  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

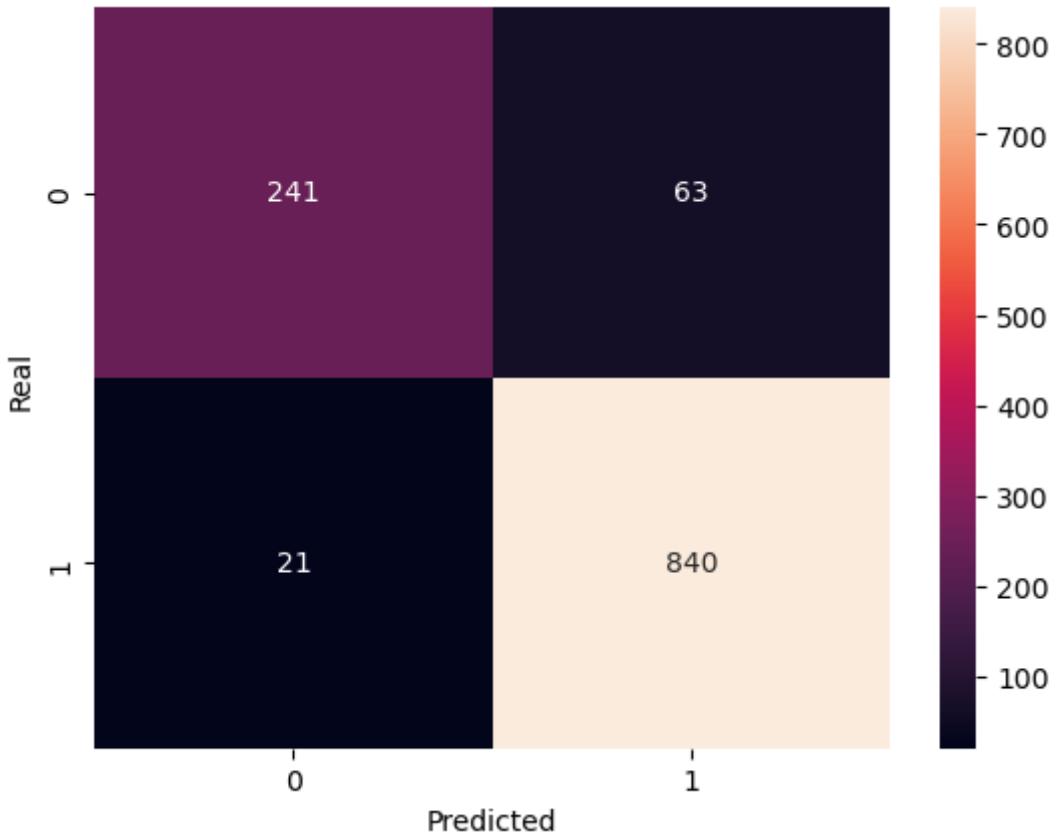


Predicted 1  
Actual 0



Predicted 1  
Actual 1





Time taken: 399.7247004508972

Test size: 1165

Total Accuracy: 0.9278969957081545

Total Precision: 0.9302325581395349

Total Recall: 0.975609756097561

Total F1 Score: 0.9523809523809524

Classification Report:

	precision	recall	f1-score	support
0	0.92	0.79	0.85	304
1	0.93	0.98	0.95	861
accuracy			0.93	1165
macro avg	0.93	0.88	0.90	1165
weighted avg	0.93	0.93	0.93	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
<b>model_batch64_epochs20_lr0.0001_optimizerSGD</b>	399.7247	0.927897	0.930233	0.97561	0.952381

Data Stored Successfully

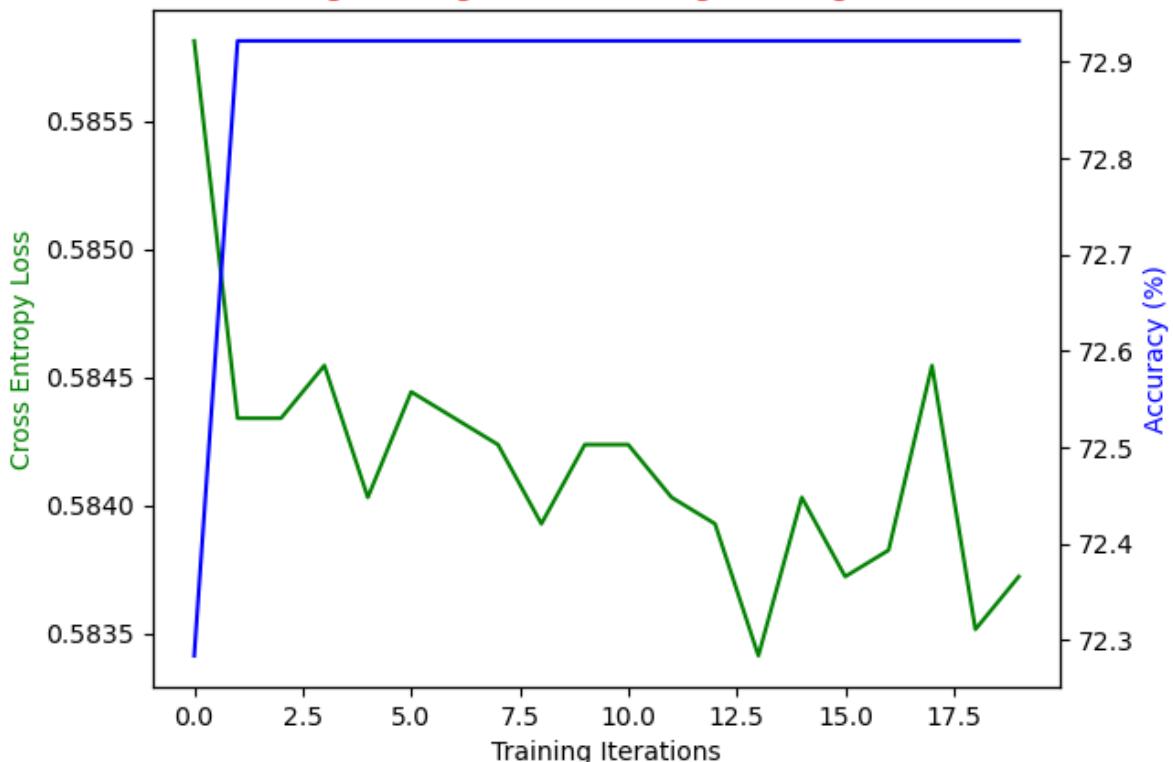
Training with batch size: 64, epochs: 20, learning rate: 0.0001, optimizer: Adam

Current: 72/90

Training [5%]	Loss: 0.5858	Accuracy: 72.28%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [15%]	Loss: 0.5843	Accuracy: 72.92%
Training [20%]	Loss: 0.5845	Accuracy: 72.92%
Training [25%]	Loss: 0.5840	Accuracy: 72.92%
Training [30%]	Loss: 0.5844	Accuracy: 72.92%
Training [35%]	Loss: 0.5843	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [45%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [55%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [65%]	Loss: 0.5839	Accuracy: 72.92%
Training [70%]	Loss: 0.5834	Accuracy: 72.92%
Training [75%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5837	Accuracy: 72.92%
Training [85%]	Loss: 0.5838	Accuracy: 72.92%
Training [90%]	Loss: 0.5845	Accuracy: 72.92%
Training [95%]	Loss: 0.5835	Accuracy: 72.92%
Training [100%]	Loss: 0.5837	Accuracy: 72.92%

Time taken: 410.6412582397461

Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 0



Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 1

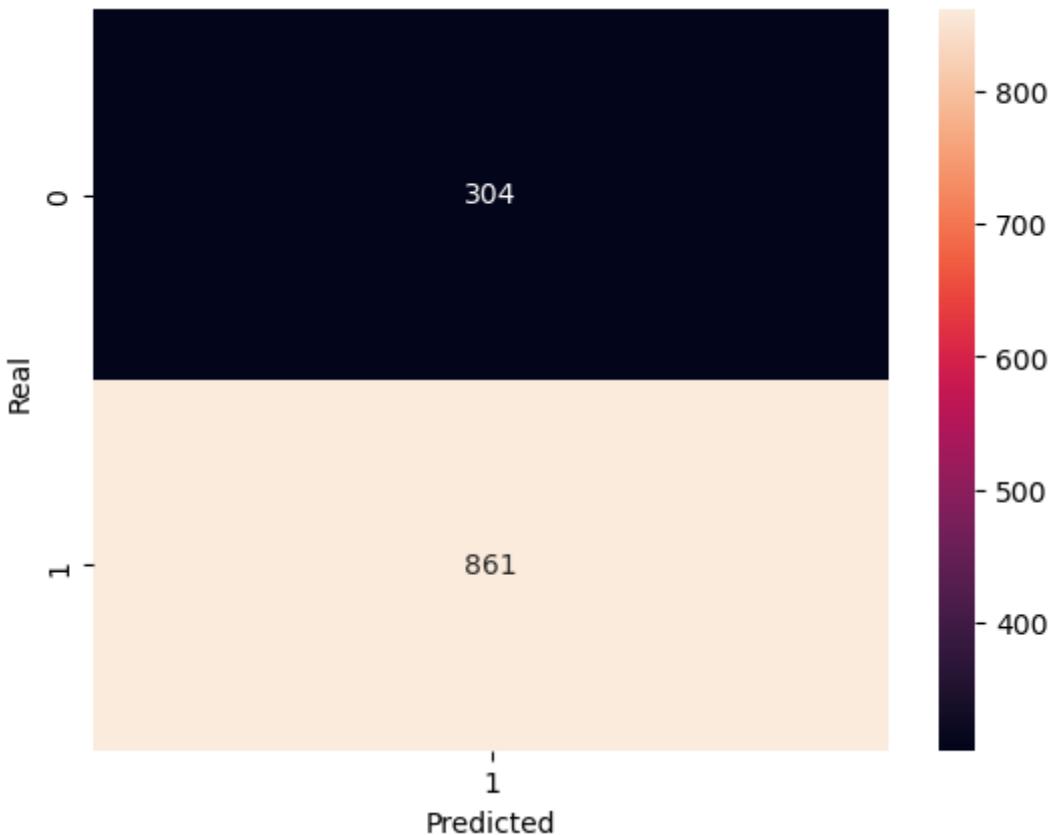


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 410.6412582397461

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch64_epochs20_lr0.0001_optimizerAdam	410.641258	0.739056	0.739056	1.0	0.849951

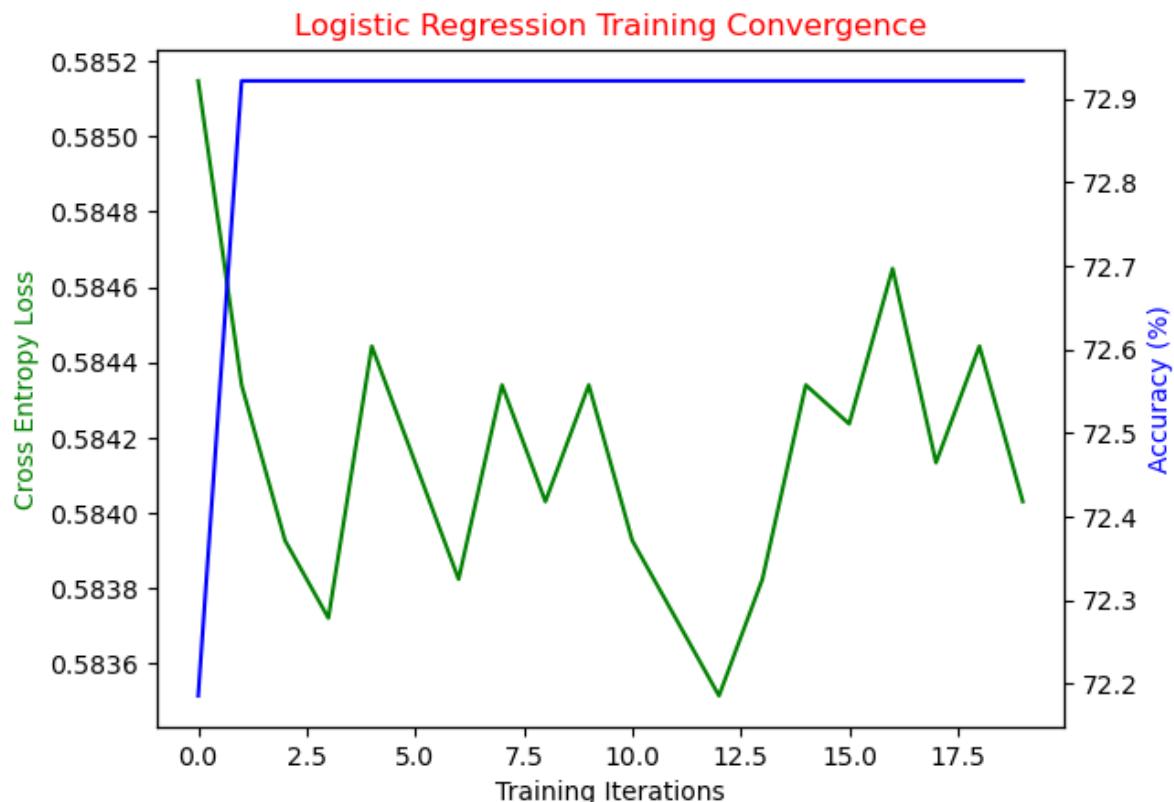
Data Stored Successfully

Training with batch size: 64, epochs: 20, learning rate: 0.001, optimizer: SGD

Current: 73/90

Training [5%]	Loss: 0.5851	Accuracy: 72.19%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [15%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5837	Accuracy: 72.92%
Training [25%]	Loss: 0.5844	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [35%]	Loss: 0.5838	Accuracy: 72.92%
Training [40%]	Loss: 0.5843	Accuracy: 72.92%
Training [45%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5843	Accuracy: 72.92%
Training [55%]	Loss: 0.5839	Accuracy: 72.92%
Training [60%]	Loss: 0.5837	Accuracy: 72.92%
Training [65%]	Loss: 0.5835	Accuracy: 72.92%
Training [70%]	Loss: 0.5838	Accuracy: 72.92%
Training [75%]	Loss: 0.5843	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [85%]	Loss: 0.5846	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [95%]	Loss: 0.5844	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 400.1477816104889



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 0



Predicted 1  
Actual 1

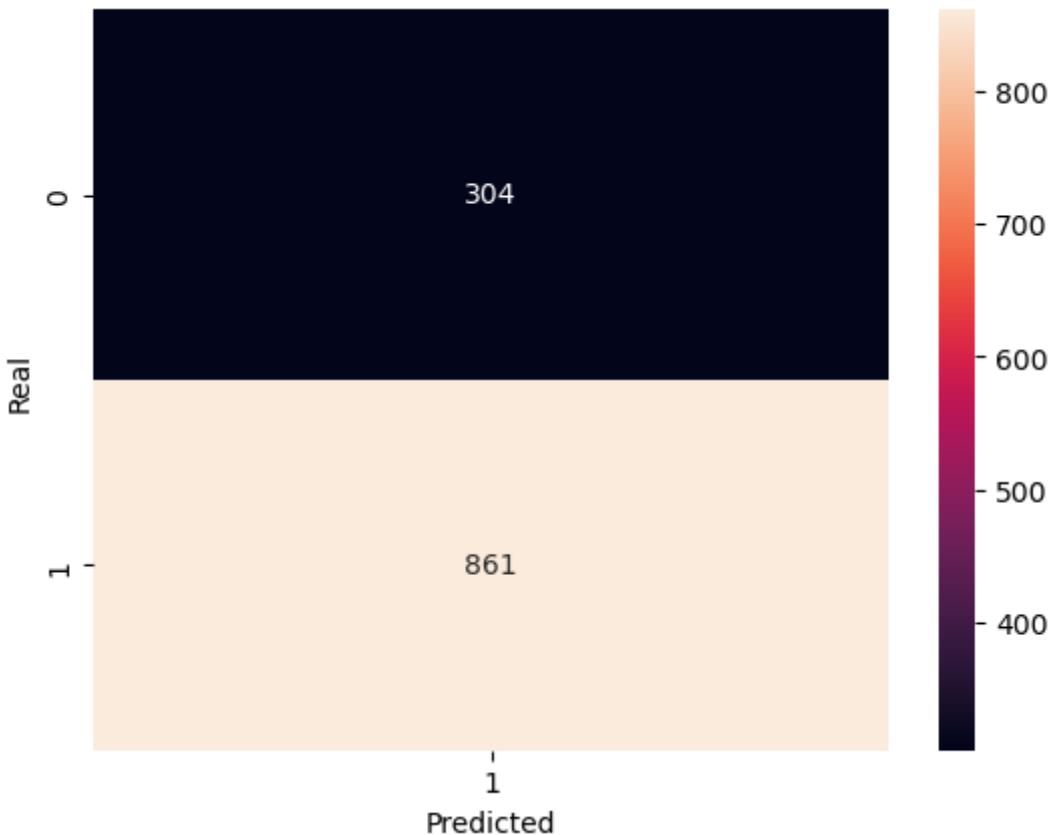


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 400.1477816104889

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch64_epochs20_lr0.001_optimizerSGD	400.147782	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

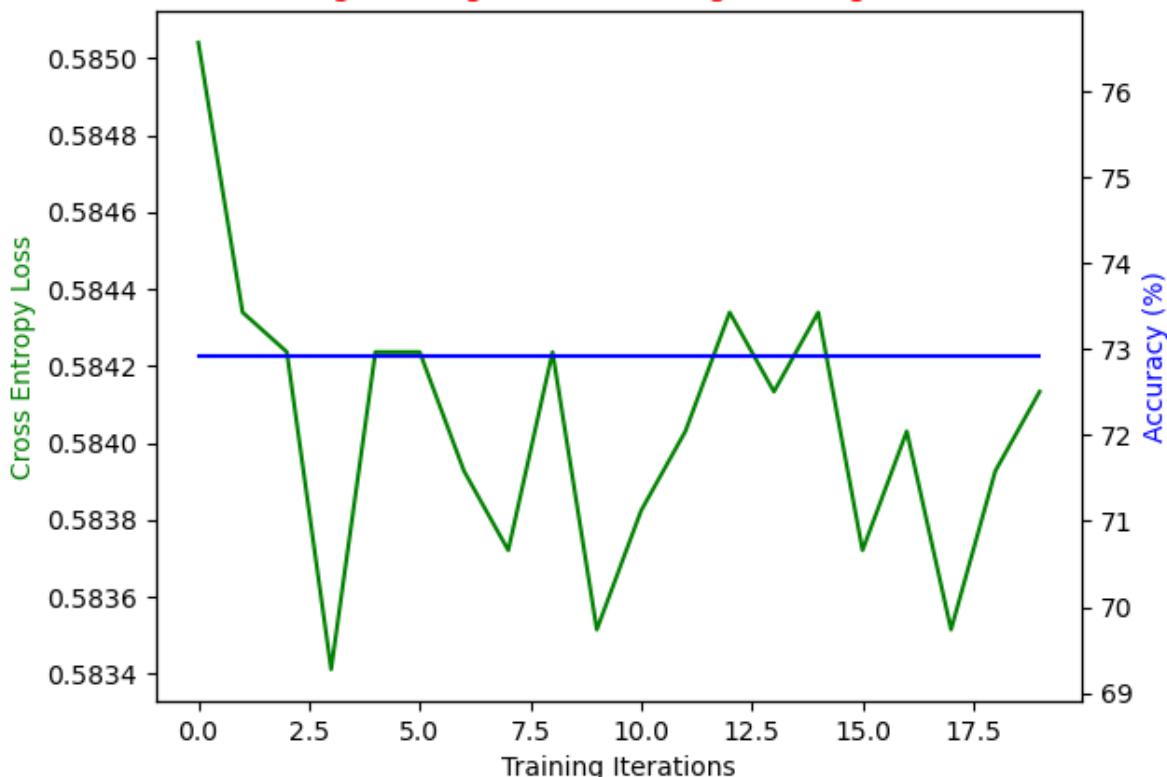
Training with batch size: 64, epochs: 20, learning rate: 0.001, optimizer: Adam

Current: 74/90

Training [5%]	Loss: 0.5850	Accuracy: 72.92%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [15%]	Loss: 0.5842	Accuracy: 72.92%
Training [20%]	Loss: 0.5834	Accuracy: 72.92%
Training [25%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [35%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5837	Accuracy: 72.92%
Training [45%]	Loss: 0.5842	Accuracy: 72.92%
Training [50%]	Loss: 0.5835	Accuracy: 72.92%
Training [55%]	Loss: 0.5838	Accuracy: 72.92%
Training [60%]	Loss: 0.5840	Accuracy: 72.92%
Training [65%]	Loss: 0.5843	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [75%]	Loss: 0.5843	Accuracy: 72.92%
Training [80%]	Loss: 0.5837	Accuracy: 72.92%
Training [85%]	Loss: 0.5840	Accuracy: 72.92%
Training [90%]	Loss: 0.5835	Accuracy: 72.92%
Training [95%]	Loss: 0.5839	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 409.8297984600067

Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 0



Predicted 1  
Actual 1

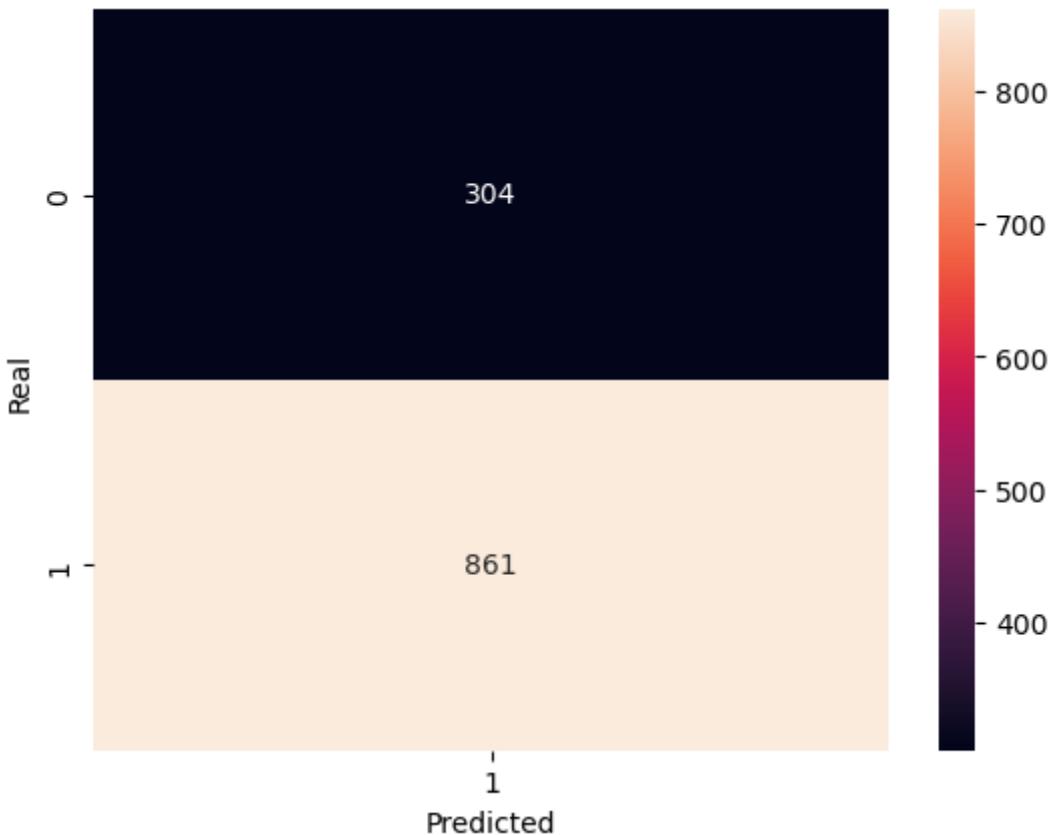


Predicted 1  
Actual 0



Predicted 1  
Actual 1





Time taken: 409.8297984600067

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs20_lr0.001_optimizerAdam</b>	409.829798	0.739056	0.739056	1.0	0.849951

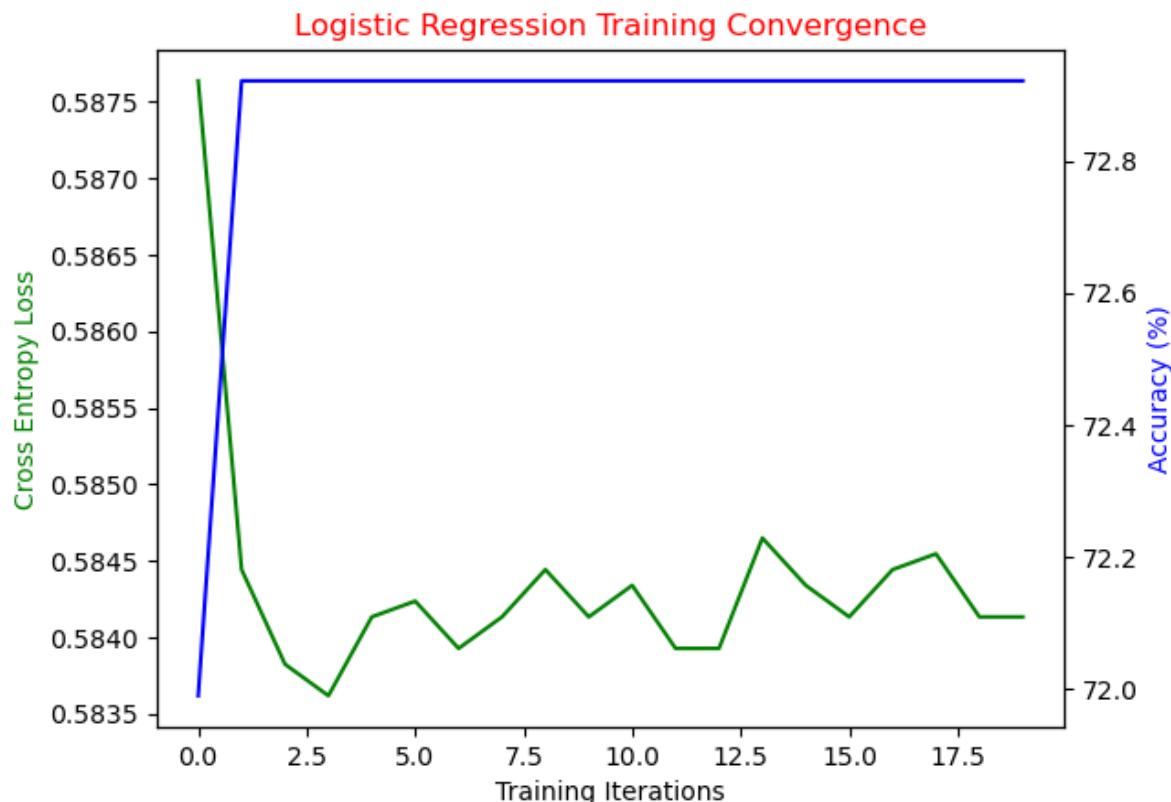
Data Stored Successfully

Training with batch size: 64, epochs: 20, learning rate: 0.01, optimizer: SGD

Current: 75/90

Training [5%]	Loss: 0.5876	Accuracy: 71.99%
Training [10%]	Loss: 0.5844	Accuracy: 72.92%
Training [15%]	Loss: 0.5838	Accuracy: 72.92%
Training [20%]	Loss: 0.5836	Accuracy: 72.92%
Training [25%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [35%]	Loss: 0.5839	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [45%]	Loss: 0.5844	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [55%]	Loss: 0.5843	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [65%]	Loss: 0.5839	Accuracy: 72.92%
Training [70%]	Loss: 0.5846	Accuracy: 72.92%
Training [75%]	Loss: 0.5843	Accuracy: 72.92%
Training [80%]	Loss: 0.5841	Accuracy: 72.92%
Training [85%]	Loss: 0.5844	Accuracy: 72.92%
Training [90%]	Loss: 0.5845	Accuracy: 72.92%
Training [95%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 400.8694086074829



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

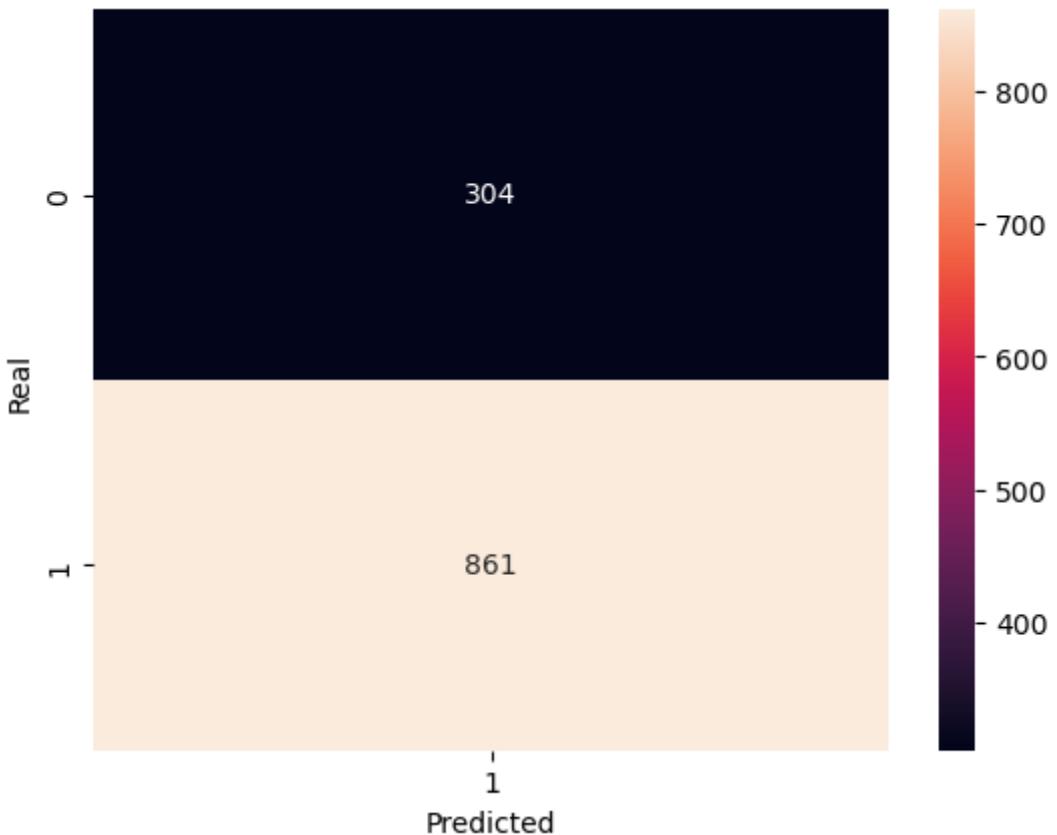


Predicted 1  
Actual 0



Predicted 1  
Actual 1





Time taken: 400.8694086074829

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

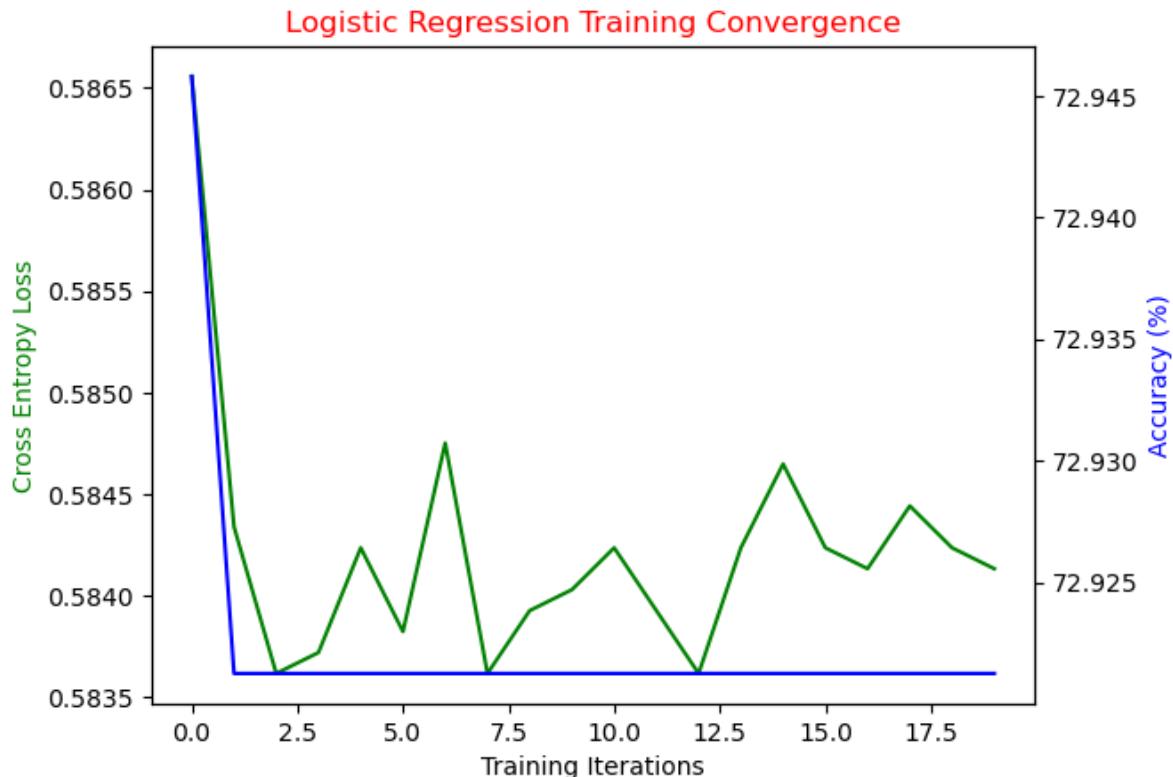
Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch64_epochs20_lr0.01_optimizerSGD	400.869409	0.739056	0.739056	1.0	0.849951
---	------------	----------	----------	-----	----------

Data Stored Successfully  
Training with batch size: 64, epochs: 20, learning rate: 0.01, optimizer: Adam  
Current: 76/90

Training [5%]	Loss: 0.5866	Accuracy: 72.95%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [15%]	Loss: 0.5836	Accuracy: 72.92%
Training [20%]	Loss: 0.5837	Accuracy: 72.92%
Training [25%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5838	Accuracy: 72.92%
Training [35%]	Loss: 0.5848	Accuracy: 72.92%
Training [40%]	Loss: 0.5836	Accuracy: 72.92%
Training [45%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [55%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [65%]	Loss: 0.5836	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [75%]	Loss: 0.5846	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [85%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5844	Accuracy: 72.92%
Training [95%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 410.1120808124542



#### Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

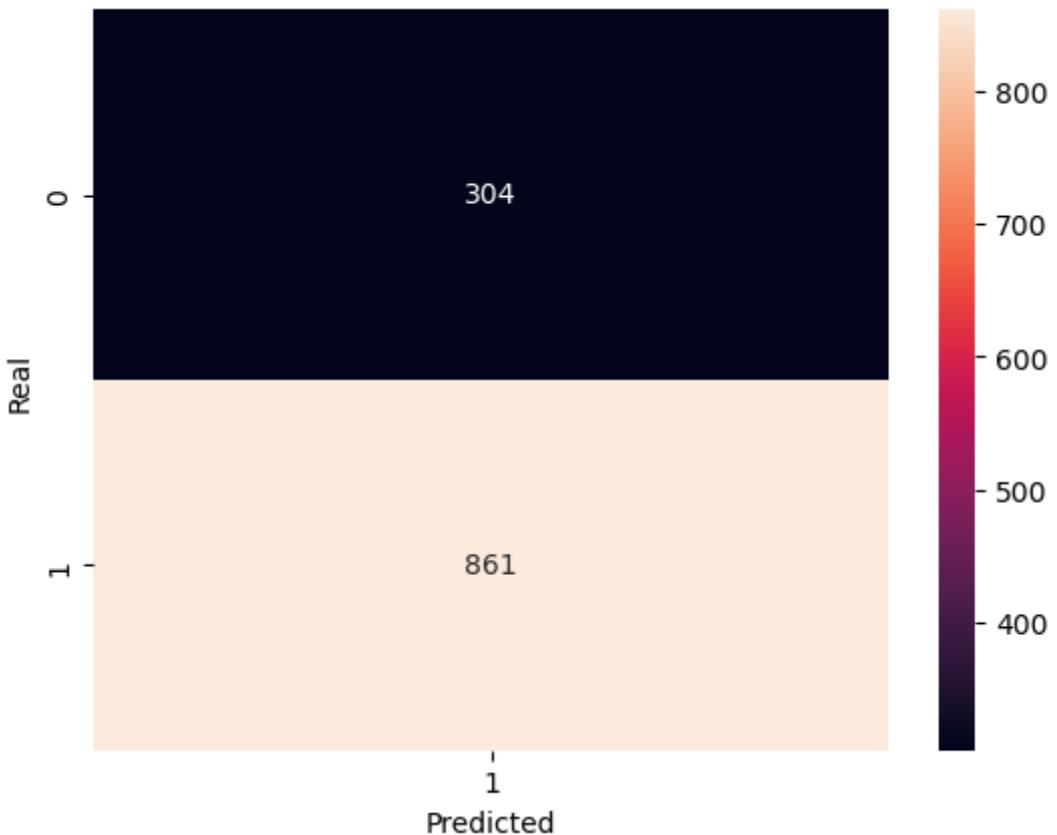


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 410.1120808124542

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

<b>Logistic Regression</b>				
<b>model_batch64_epochs20_lr0.01_optimizerAdam</b>	410.112081	0.739056	0.739056	1.0 0.849951

Data Stored Successfully

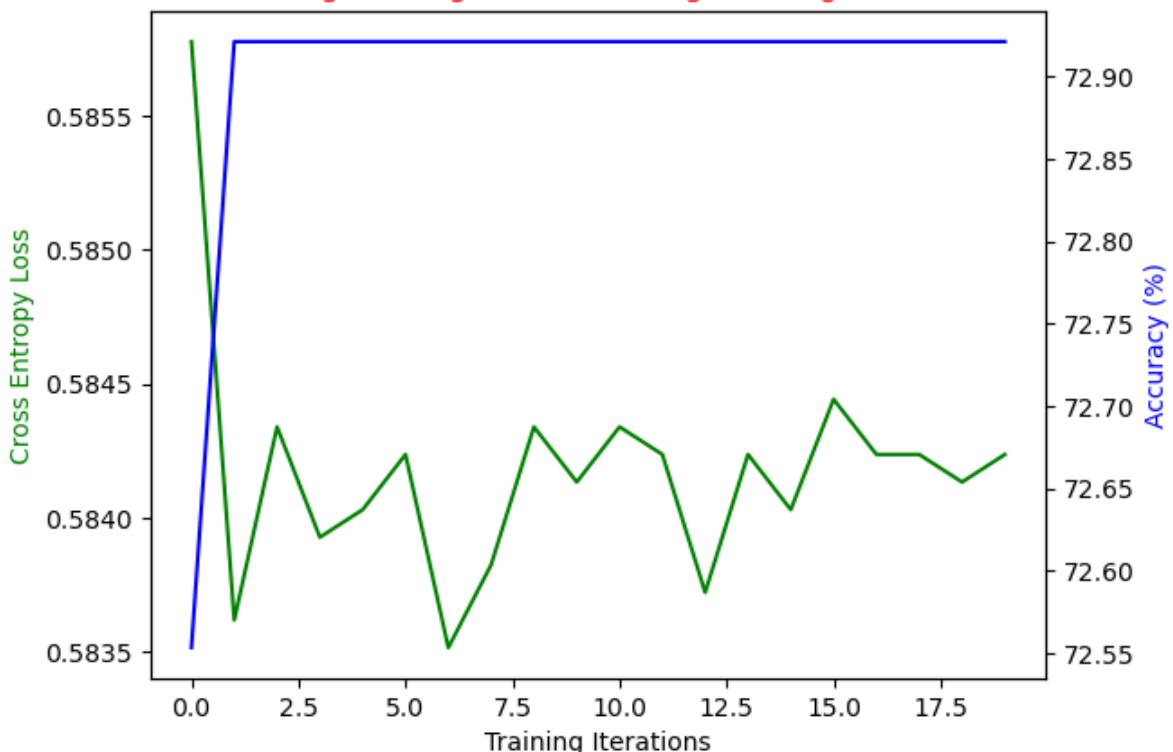
Training with batch size: 64, epochs: 20, learning rate: 0.1, optimizer: SGD

Current: 77/90

Training [%]	Loss	Accuracy
Training [ 5%]	0.5858	72.55%
Training [10%]	0.5836	72.92%
Training [15%]	0.5843	72.92%
Training [20%]	0.5839	72.92%
Training [25%]	0.5840	72.92%
Training [30%]	0.5842	72.92%
Training [35%]	0.5835	72.92%
Training [40%]	0.5838	72.92%
Training [45%]	0.5843	72.92%
Training [50%]	0.5841	72.92%
Training [55%]	0.5843	72.92%
Training [60%]	0.5842	72.92%
Training [65%]	0.5837	72.92%
Training [70%]	0.5842	72.92%
Training [75%]	0.5840	72.92%
Training [80%]	0.5844	72.92%
Training [85%]	0.5842	72.92%
Training [90%]	0.5842	72.92%
Training [95%]	0.5841	72.92%
Training [100%]	0.5842	72.92%

Time taken: 398.9622218608856

### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 0

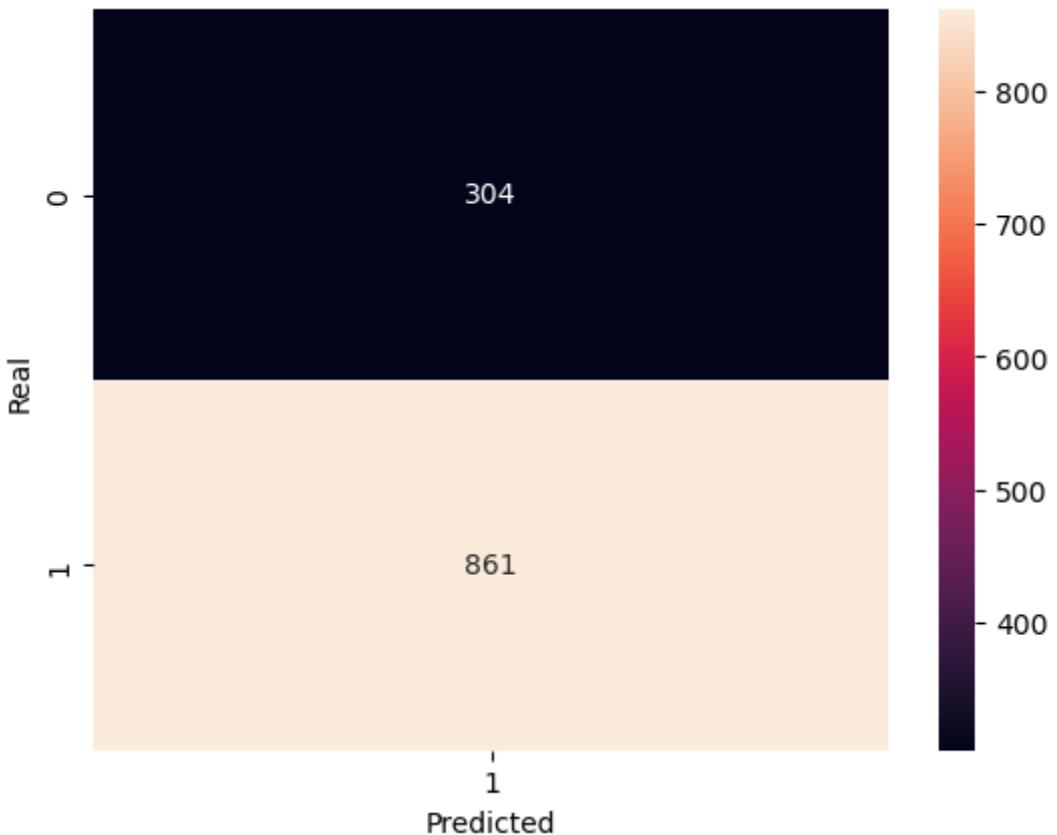


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 398.9622218608856

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch64_epochs20_lr0.1_optimizerSGD	398.962222	0.739056	0.739056	1.0	0.849951
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Data Stored Successfully

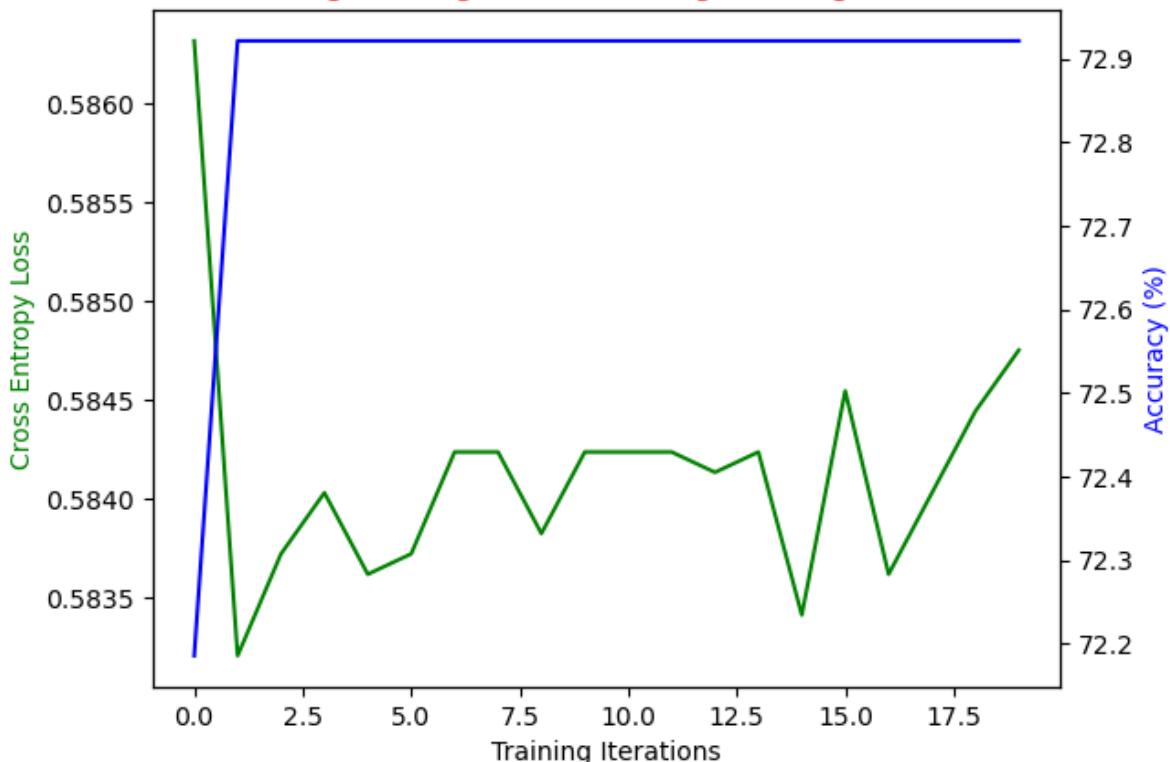
Training with batch size: 64, epochs: 20, learning rate: 0.1, optimizer: Adam

Current: 78/90

Training [5%]	Loss: 0.5863	Accuracy: 72.19%
Training [10%]	Loss: 0.5832	Accuracy: 72.92%
Training [15%]	Loss: 0.5837	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [25%]	Loss: 0.5836	Accuracy: 72.92%
Training [30%]	Loss: 0.5837	Accuracy: 72.92%
Training [35%]	Loss: 0.5842	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [45%]	Loss: 0.5838	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [55%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [65%]	Loss: 0.5841	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [75%]	Loss: 0.5834	Accuracy: 72.92%
Training [80%]	Loss: 0.5845	Accuracy: 72.92%
Training [85%]	Loss: 0.5836	Accuracy: 72.92%
Training [90%]	Loss: 0.5840	Accuracy: 72.92%
Training [95%]	Loss: 0.5844	Accuracy: 72.92%
Training [100%]	Loss: 0.5848	Accuracy: 72.92%

Time taken: 409.20268964767456

Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5748

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 0



Predicted 1  
Actual 0

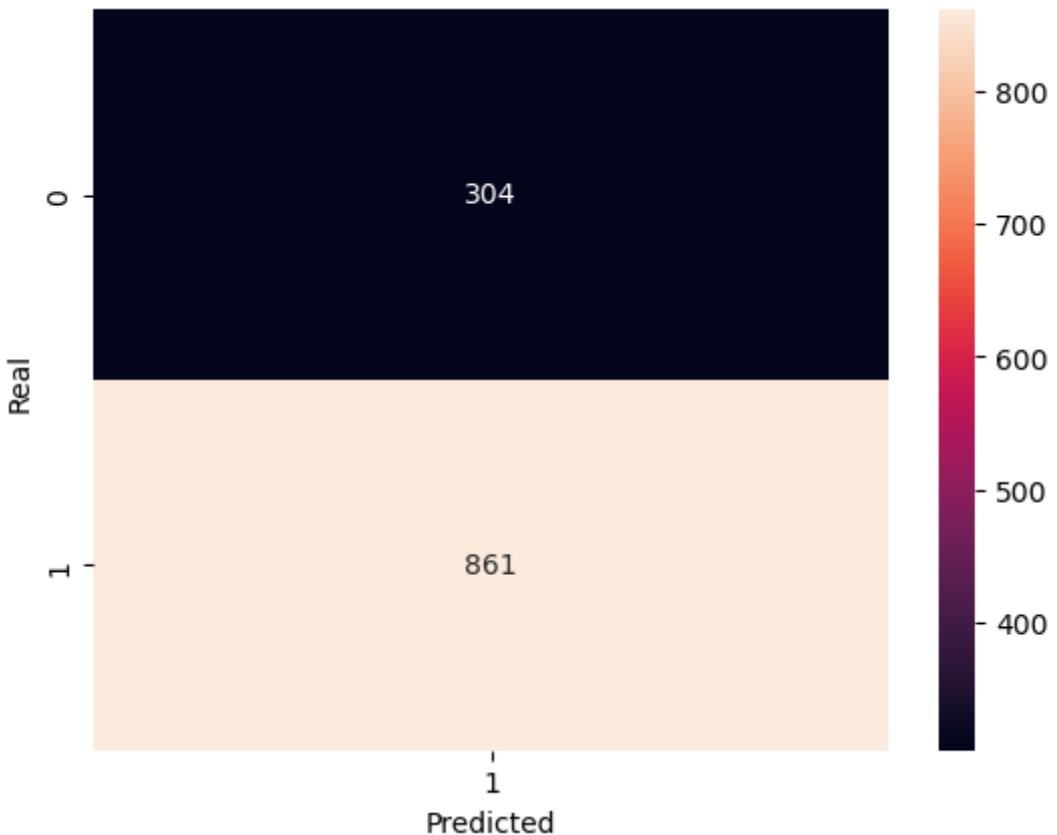


Predicted 1  
Actual 0



Predicted 1  
Actual 1





Time taken: 409.20268964767456

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
```

```
_warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
```

```
_warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
```

```
_warn_prf(average, modifier, msg_start, len(result))
```

Time	Accuracy	Precision	Recall	F1 score
------	----------	-----------	--------	----------

Logistic Regression model_batch64_epochs20_lr0.1_optimizerAdam	409.20269	0.739056	0.739056	1.0	0.849951
---	-----------	----------	----------	-----	----------

Data Stored Successfully

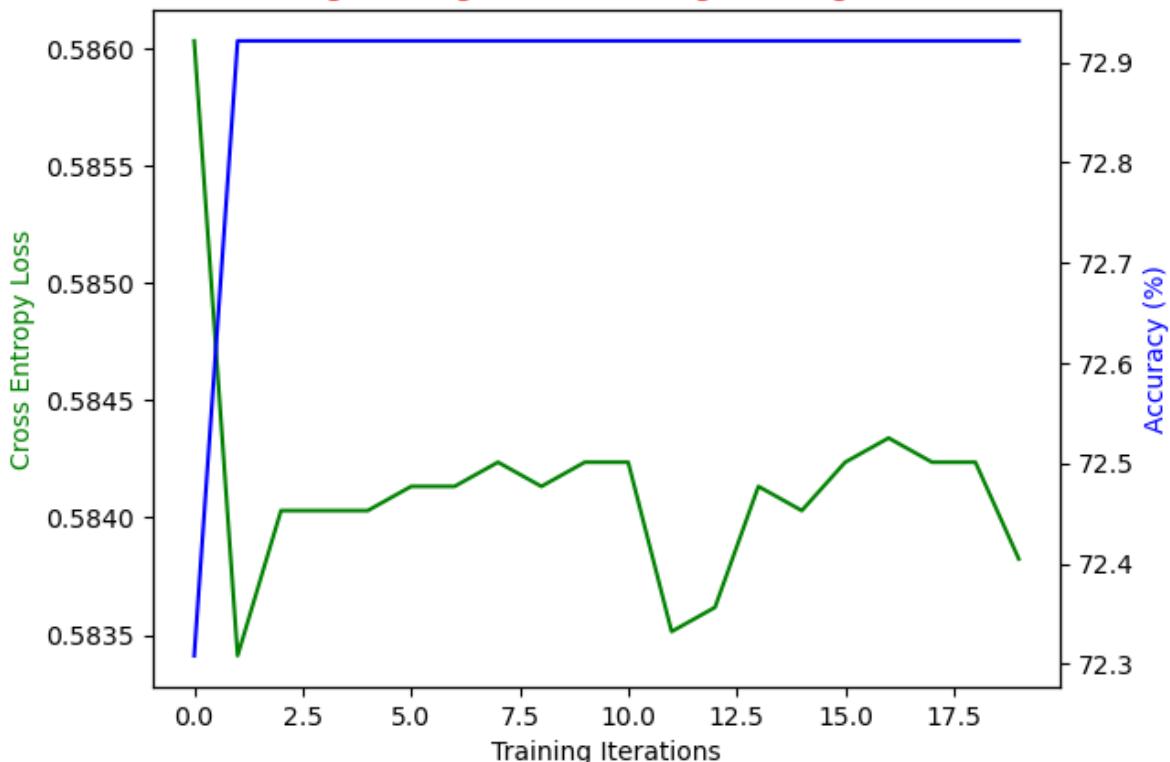
Training with batch size: 64, epochs: 20, learning rate: 1, optimizer: SGD

Current: 79/90

Training [5%]	Loss: 0.5860	Accuracy: 72.31%
Training [10%]	Loss: 0.5834	Accuracy: 72.92%
Training [15%]	Loss: 0.5840	Accuracy: 72.92%
Training [20%]	Loss: 0.5840	Accuracy: 72.92%
Training [25%]	Loss: 0.5840	Accuracy: 72.92%
Training [30%]	Loss: 0.5841	Accuracy: 72.92%
Training [35%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5842	Accuracy: 72.92%
Training [45%]	Loss: 0.5841	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [55%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5835	Accuracy: 72.92%
Training [65%]	Loss: 0.5836	Accuracy: 72.92%
Training [70%]	Loss: 0.5841	Accuracy: 72.92%
Training [75%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [85%]	Loss: 0.5843	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [95%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5838	Accuracy: 72.92%

Time taken: 400.8607876300812

### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

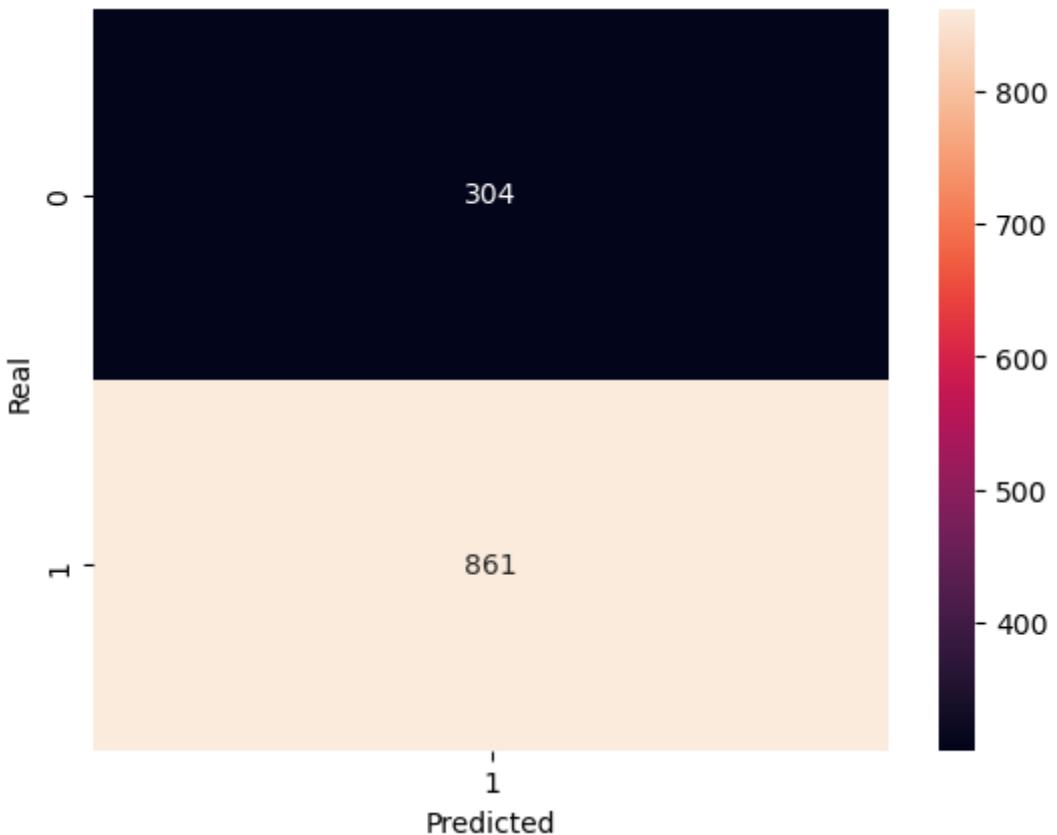


Predicted 1  
Actual 0



Predicted 1  
Actual 0





Time taken: 400.8607876300812

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

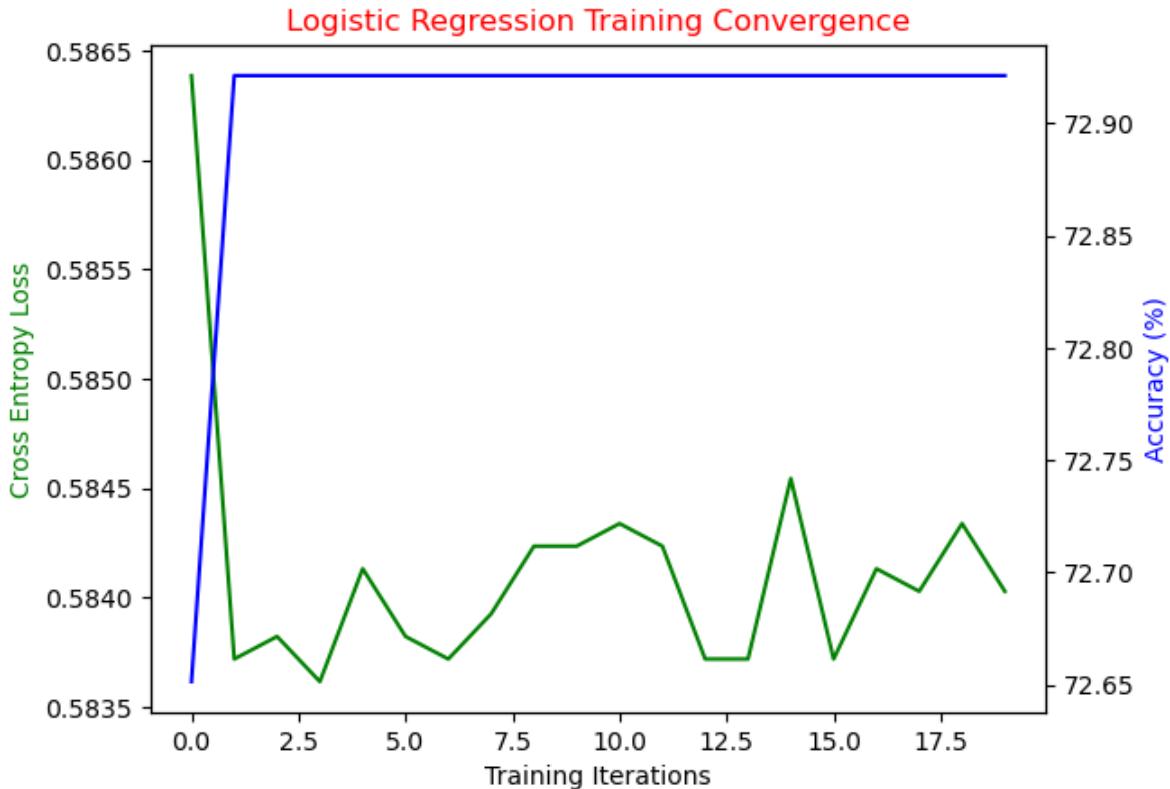
Time Accuracy Precision Recall F1 score

Logistic Regression model_batch64_epochs20_lr1_optimizerSGD	Time	Accuracy	Precision	Recall	F1 score
	400.860788	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 64, epochs: 20, learning rate: 1, optimizer: Adam  
Current: 80/90

Training [5%]	Loss: 0.5864	Accuracy: 72.65%
Training [10%]	Loss: 0.5837	Accuracy: 72.92%
Training [15%]	Loss: 0.5838	Accuracy: 72.92%
Training [20%]	Loss: 0.5836	Accuracy: 72.92%
Training [25%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5838	Accuracy: 72.92%
Training [35%]	Loss: 0.5837	Accuracy: 72.92%
Training [40%]	Loss: 0.5839	Accuracy: 72.92%
Training [45%]	Loss: 0.5842	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [55%]	Loss: 0.5843	Accuracy: 72.92%
Training [60%]	Loss: 0.5842	Accuracy: 72.92%
Training [65%]	Loss: 0.5837	Accuracy: 72.92%
Training [70%]	Loss: 0.5837	Accuracy: 72.92%
Training [75%]	Loss: 0.5845	Accuracy: 72.92%
Training [80%]	Loss: 0.5837	Accuracy: 72.92%
Training [85%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5840	Accuracy: 72.92%
Training [95%]	Loss: 0.5843	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 410.8679690361023



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Predicted 1  
Actual 1

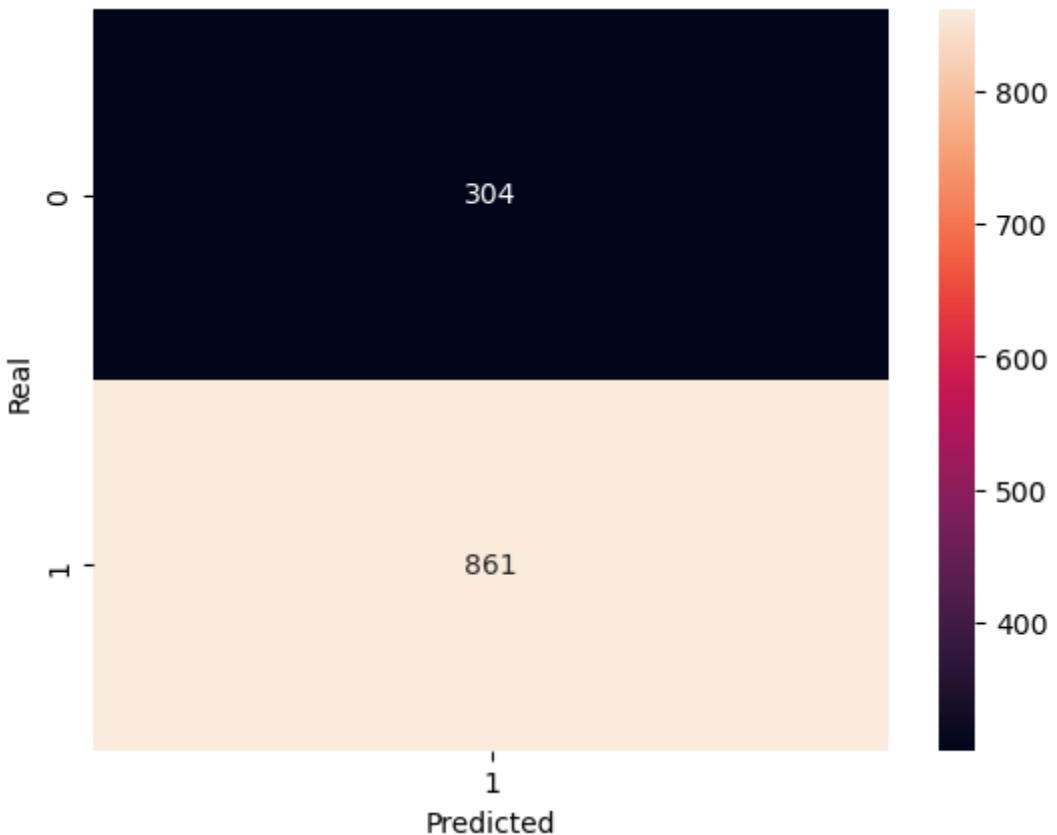


Predicted 1  
Actual 1



Predicted 1  
Actual 1





Time taken: 410.8679690361023

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

Time Accuracy Precision Recall F1 score

Logistic Regression model_batch64_epochs20_lr1_optimizerAdam	Time	Accuracy	Precision	Recall	F1 score
	410.867969	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

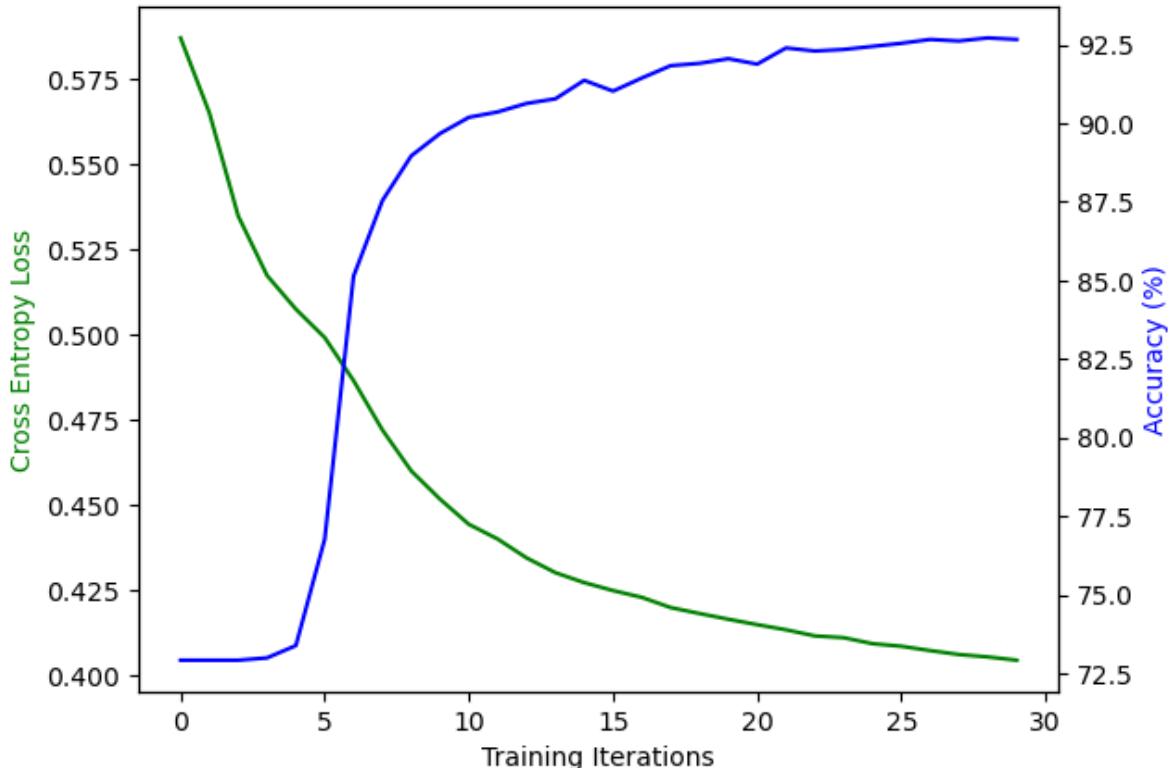
Training with batch size: 64, epochs: 30, learning rate: 0.0001, optimizer: SGD

Current: 81/90

Training [3%]	Loss: 0.5871	Accuracy: 72.92%
Training [7%]	Loss: 0.5651	Accuracy: 72.92%
Training [10%]	Loss: 0.5348	Accuracy: 72.92%
Training [13%]	Loss: 0.5174	Accuracy: 72.99%
Training [17%]	Loss: 0.5075	Accuracy: 73.39%
Training [20%]	Loss: 0.4992	Accuracy: 76.77%
Training [23%]	Loss: 0.4866	Accuracy: 85.14%
Training [27%]	Loss: 0.4721	Accuracy: 87.54%
Training [30%]	Loss: 0.4601	Accuracy: 88.96%
Training [33%]	Loss: 0.4518	Accuracy: 89.67%
Training [37%]	Loss: 0.4444	Accuracy: 90.19%
Training [40%]	Loss: 0.4401	Accuracy: 90.36%
Training [43%]	Loss: 0.4346	Accuracy: 90.63%
Training [47%]	Loss: 0.4303	Accuracy: 90.78%
Training [50%]	Loss: 0.4273	Accuracy: 91.37%
Training [53%]	Loss: 0.4250	Accuracy: 91.02%
Training [57%]	Loss: 0.4230	Accuracy: 91.44%
Training [60%]	Loss: 0.4200	Accuracy: 91.83%
Training [63%]	Loss: 0.4183	Accuracy: 91.91%
Training [67%]	Loss: 0.4166	Accuracy: 92.05%
Training [70%]	Loss: 0.4150	Accuracy: 91.88%
Training [73%]	Loss: 0.4135	Accuracy: 92.40%
Training [77%]	Loss: 0.4117	Accuracy: 92.30%
Training [80%]	Loss: 0.4112	Accuracy: 92.35%
Training [83%]	Loss: 0.4094	Accuracy: 92.45%
Training [87%]	Loss: 0.4087	Accuracy: 92.54%
Training [90%]	Loss: 0.4074	Accuracy: 92.67%
Training [93%]	Loss: 0.4062	Accuracy: 92.62%
Training [97%]	Loss: 0.4055	Accuracy: 92.72%
Training [100%]	Loss: 0.4046	Accuracy: 92.67%

Time taken: 594.5287621021271

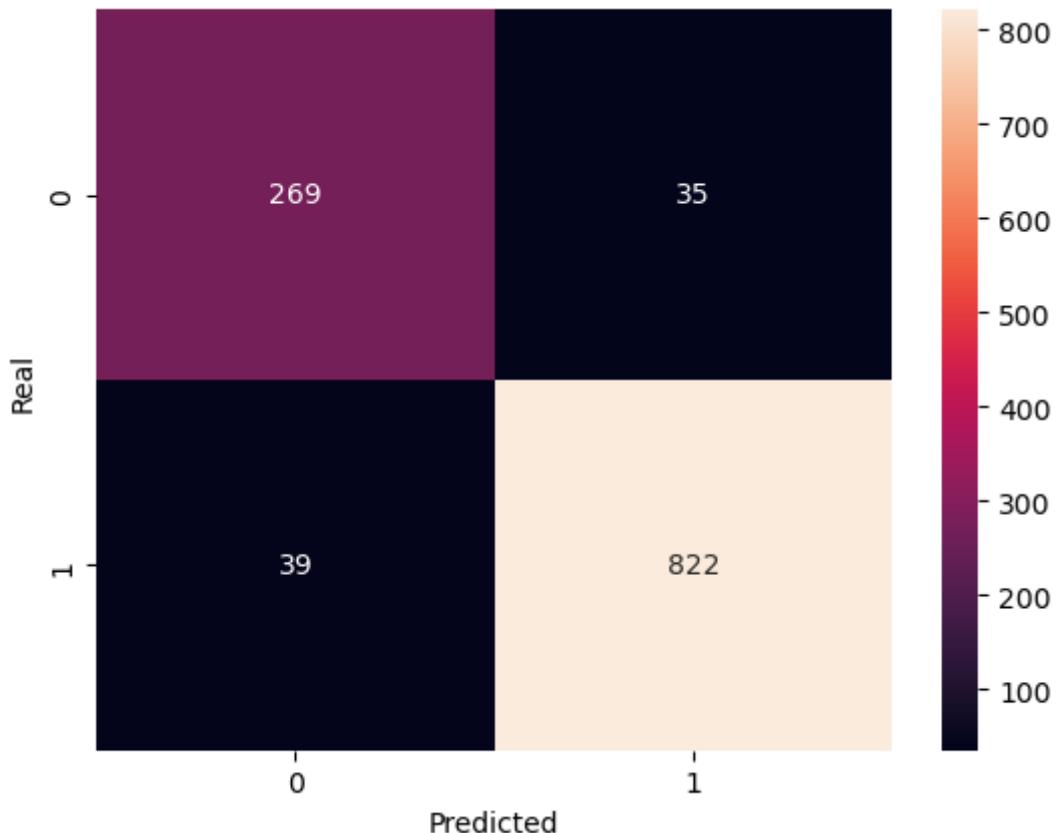
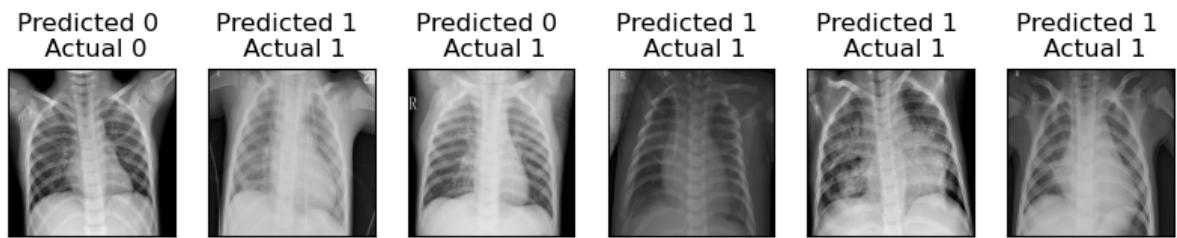
Logistic Regression Training Convergence



Performance on test data:

Loss: 0.3980

Accuracy: 93.65%



Time taken: 594.5287621021271

Test size: 1165

Total Accuracy: 0.936480686695279

Total Precision: 0.9591598599766628

Total Recall: 0.9547038327526133

Total F1 Score: 0.9569266589057043

Classification Report:

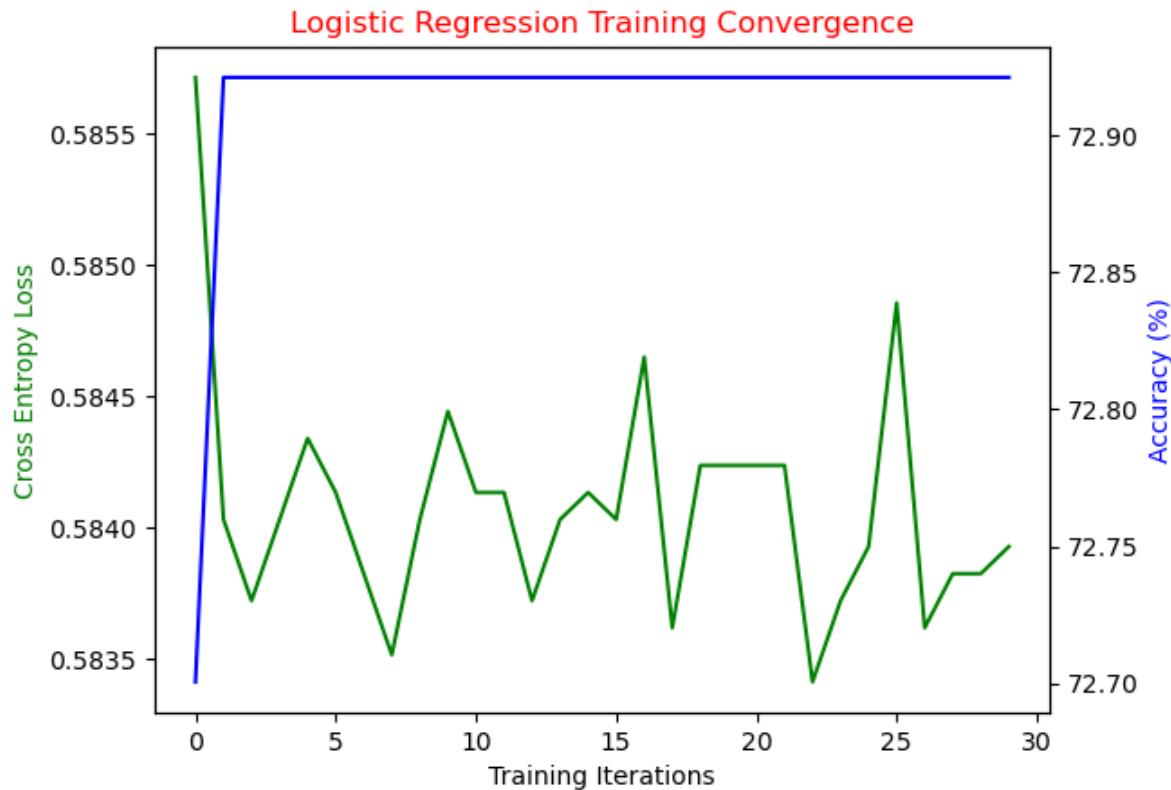
	precision	recall	f1-score	support
0	0.87	0.88	0.88	304
1	0.96	0.95	0.96	861
accuracy			0.94	1165
macro avg	0.92	0.92	0.92	1165
weighted avg	0.94	0.94	0.94	1165

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b>					
model_batch64_epochs30_lr0.0001_optimizerSGD	594.528762	0.936481	0.95916	0.954704	0.95692

Data Stored Successfully  
 Training with batch size: 64, epochs: 30, learning rate: 0.0001, optimizer: Adam  
 Current: 82/90

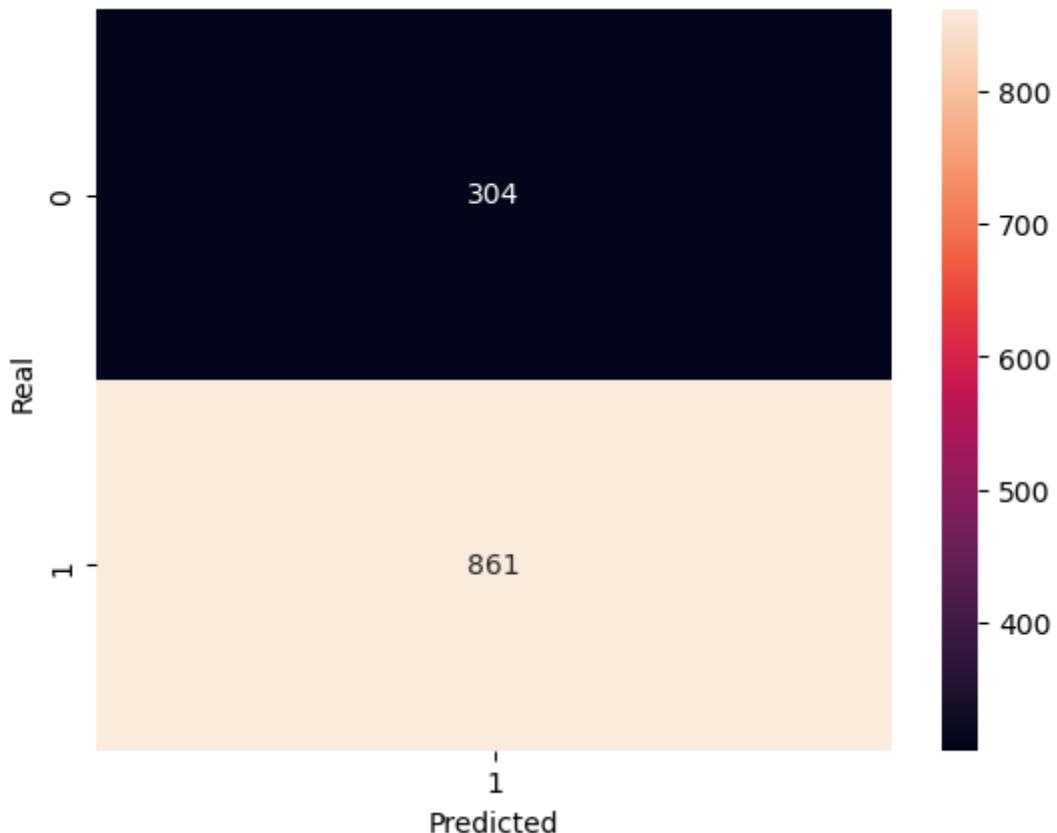
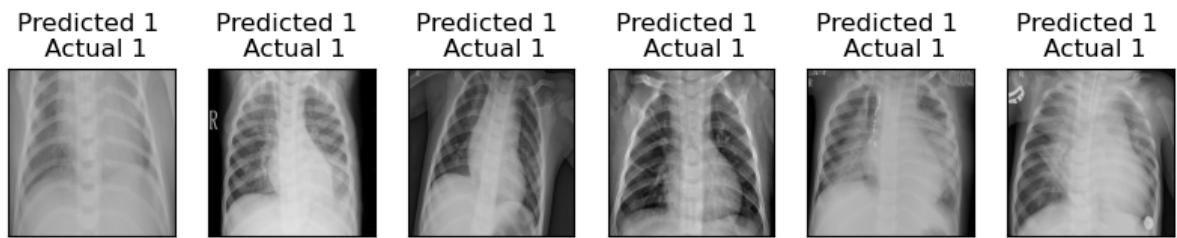
Training [3%]	Loss: 0.5857	Accuracy: 72.70%
Training [7%]	Loss: 0.5840	Accuracy: 72.92%
Training [10%]	Loss: 0.5837	Accuracy: 72.92%
Training [13%]	Loss: 0.5840	Accuracy: 72.92%
Training [17%]	Loss: 0.5843	Accuracy: 72.92%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [23%]	Loss: 0.5838	Accuracy: 72.92%
Training [27%]	Loss: 0.5835	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [33%]	Loss: 0.5844	Accuracy: 72.92%
Training [37%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [43%]	Loss: 0.5837	Accuracy: 72.92%
Training [47%]	Loss: 0.5840	Accuracy: 72.92%
Training [50%]	Loss: 0.5841	Accuracy: 72.92%
Training [53%]	Loss: 0.5840	Accuracy: 72.92%
Training [57%]	Loss: 0.5846	Accuracy: 72.92%
Training [60%]	Loss: 0.5836	Accuracy: 72.92%
Training [63%]	Loss: 0.5842	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [73%]	Loss: 0.5842	Accuracy: 72.92%
Training [77%]	Loss: 0.5834	Accuracy: 72.92%
Training [80%]	Loss: 0.5837	Accuracy: 72.92%
Training [83%]	Loss: 0.5839	Accuracy: 72.92%
Training [87%]	Loss: 0.5849	Accuracy: 72.92%
Training [90%]	Loss: 0.5836	Accuracy: 72.92%
Training [93%]	Loss: 0.5838	Accuracy: 72.92%
Training [97%]	Loss: 0.5838	Accuracy: 72.92%
Training [100%]	Loss: 0.5839	Accuracy: 72.92%

Time taken: 619.6276483535767



Performance on test data:

Loss: 0.5747  
 Accuracy: 73.91%



Time taken: 619.6276483535767

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

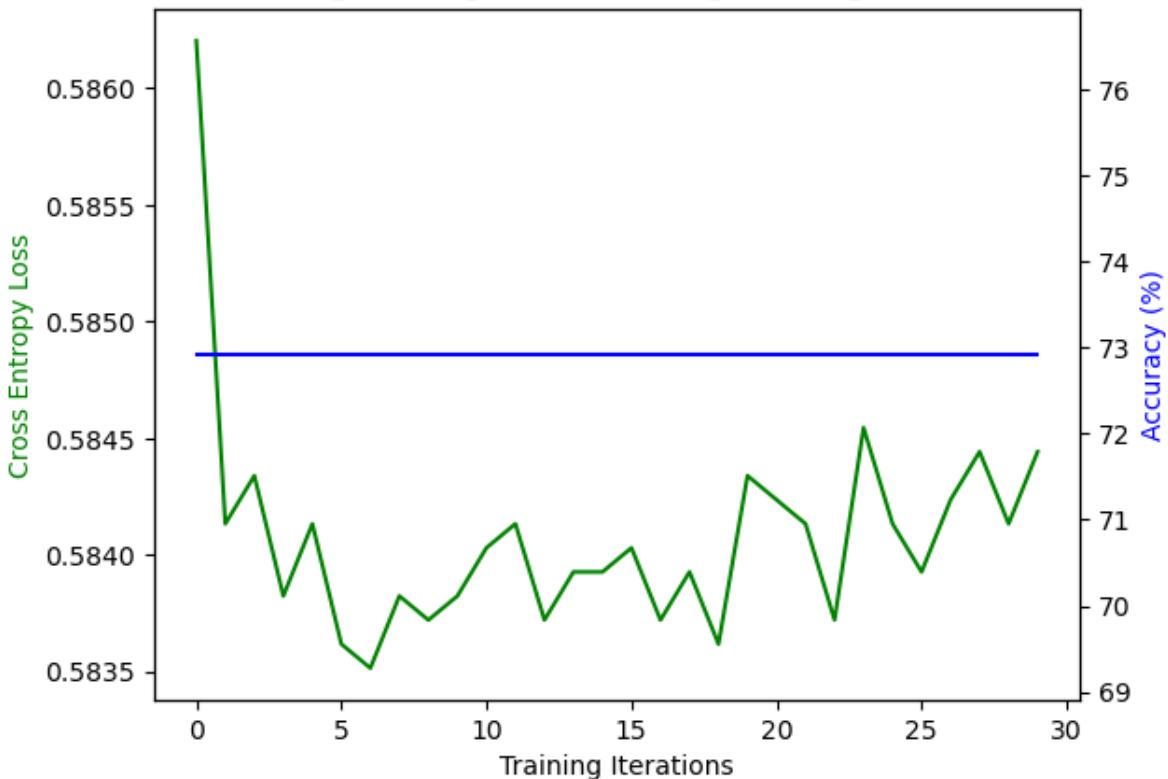
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr0.0001_optimizerAdam</b>	619.627648	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 64, epochs: 30, learning rate: 0.001, optimizer: SGD  
Current: 83/90

Training [3%]	Loss: 0.5862	Accuracy: 72.92%
Training [7%]	Loss: 0.5841	Accuracy: 72.92%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [13%]	Loss: 0.5838	Accuracy: 72.92%
Training [17%]	Loss: 0.5841	Accuracy: 72.92%
Training [20%]	Loss: 0.5836	Accuracy: 72.92%
Training [23%]	Loss: 0.5835	Accuracy: 72.92%
Training [27%]	Loss: 0.5838	Accuracy: 72.92%
Training [30%]	Loss: 0.5837	Accuracy: 72.92%
Training [33%]	Loss: 0.5838	Accuracy: 72.92%
Training [37%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [43%]	Loss: 0.5837	Accuracy: 72.92%
Training [47%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5839	Accuracy: 72.92%
Training [53%]	Loss: 0.5840	Accuracy: 72.92%
Training [57%]	Loss: 0.5837	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5836	Accuracy: 72.92%
Training [67%]	Loss: 0.5843	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [73%]	Loss: 0.5841	Accuracy: 72.92%
Training [77%]	Loss: 0.5837	Accuracy: 72.92%
Training [80%]	Loss: 0.5845	Accuracy: 72.92%
Training [83%]	Loss: 0.5841	Accuracy: 72.92%
Training [87%]	Loss: 0.5839	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [93%]	Loss: 0.5844	Accuracy: 72.92%
Training [97%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5844	Accuracy: 72.92%

Time taken: 599.9544579982758

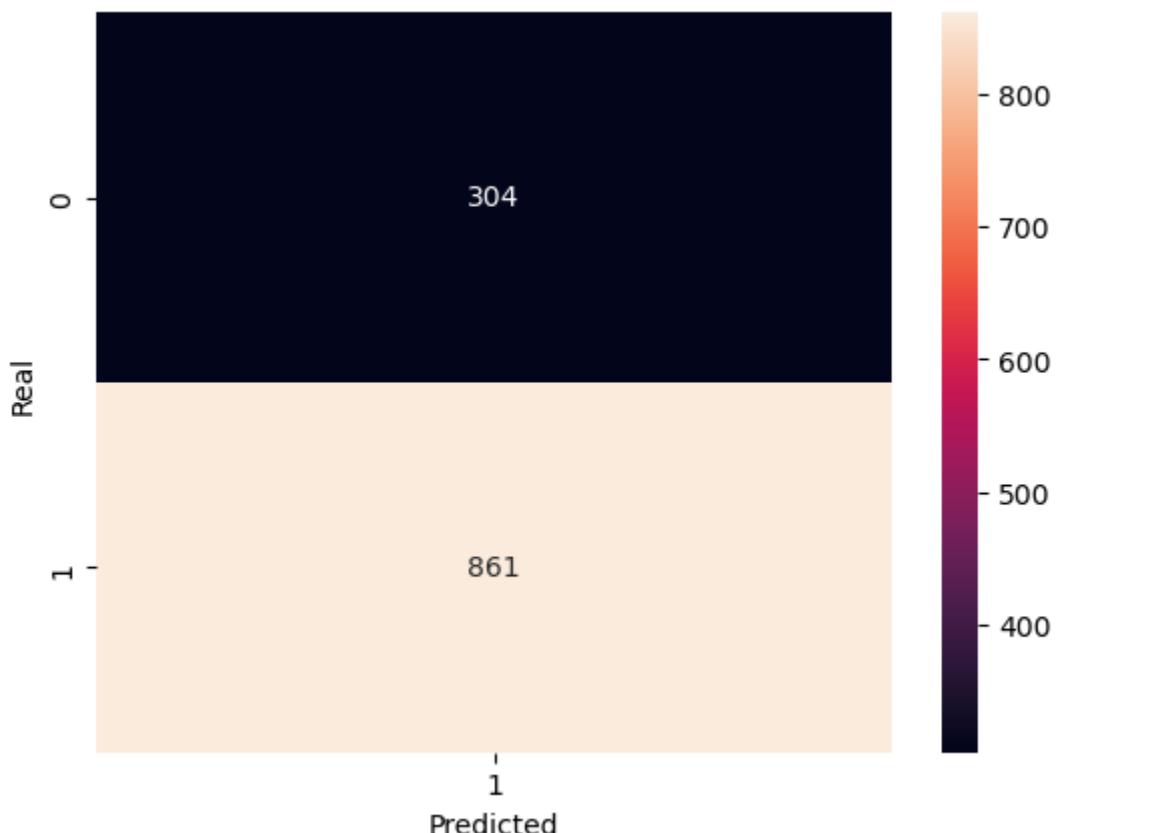
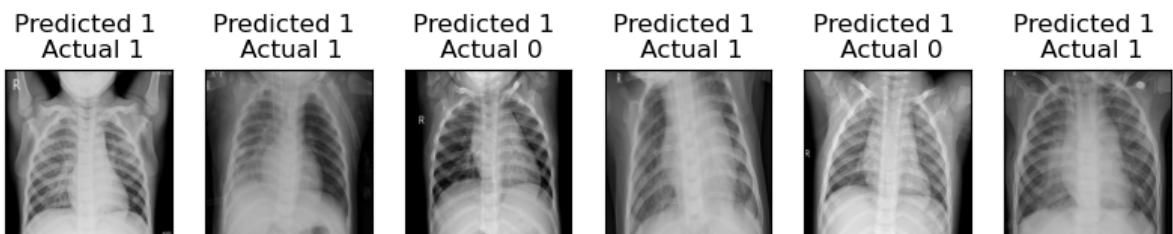
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%



```
Time taken: 599.9544579982758
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:
```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr0.001_optimizerSGD</b>	599.954458	0.739056	0.739056	1.0	0.849951

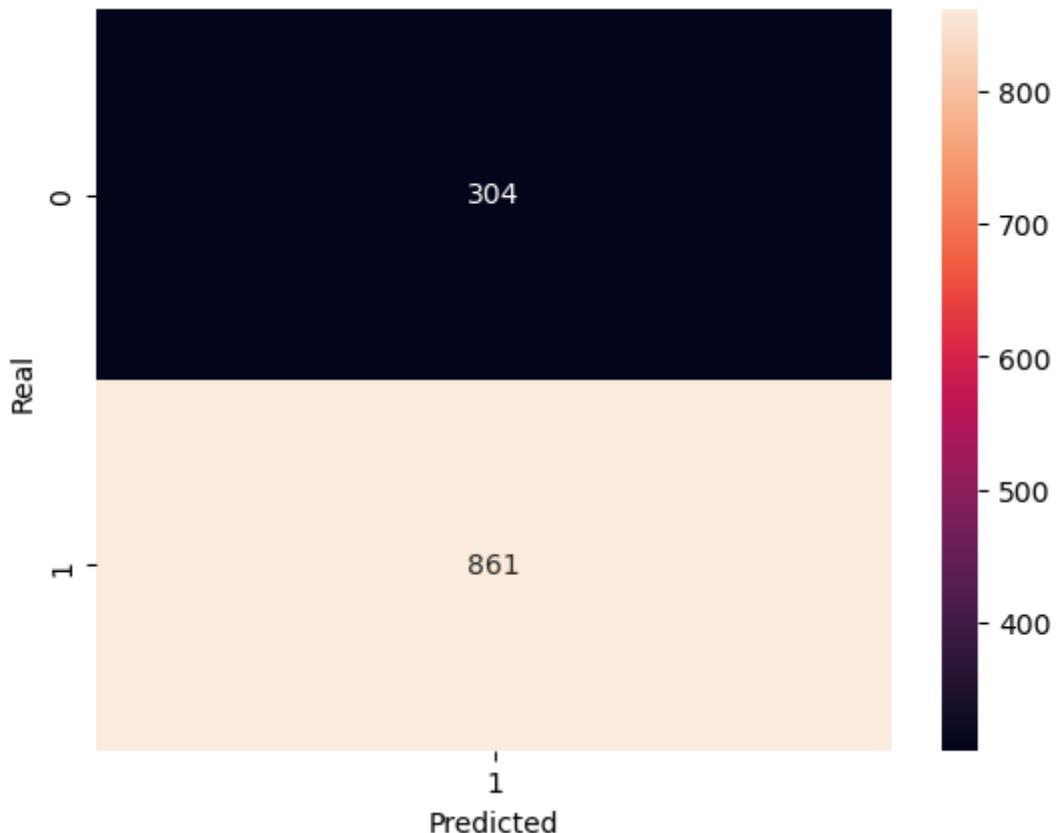
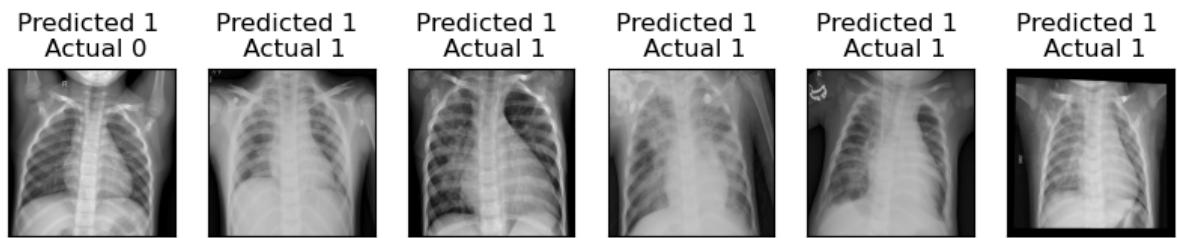
Data Stored Successfully  
 Training with batch size: 64, epochs: 30, learning rate: 0.001, optimizer: Adam  
 Current: 84/90

Training [3%]	Loss: 0.5860	Accuracy: 72.19%
Training [7%]	Loss: 0.5840	Accuracy: 72.92%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [13%]	Loss: 0.5833	Accuracy: 72.92%
Training [17%]	Loss: 0.5840	Accuracy: 72.92%
Training [20%]	Loss: 0.5843	Accuracy: 72.92%
Training [23%]	Loss: 0.5838	Accuracy: 72.92%
Training [27%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [33%]	Loss: 0.5841	Accuracy: 72.92%
Training [37%]	Loss: 0.5844	Accuracy: 72.92%
Training [40%]	Loss: 0.5840	Accuracy: 72.92%
Training [43%]	Loss: 0.5846	Accuracy: 72.92%
Training [47%]	Loss: 0.5835	Accuracy: 72.92%
Training [50%]	Loss: 0.5840	Accuracy: 72.92%
Training [53%]	Loss: 0.5842	Accuracy: 72.92%
Training [57%]	Loss: 0.5843	Accuracy: 72.92%
Training [60%]	Loss: 0.5837	Accuracy: 72.92%
Training [63%]	Loss: 0.5845	Accuracy: 72.92%
Training [67%]	Loss: 0.5846	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [73%]	Loss: 0.5839	Accuracy: 72.92%
Training [77%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5842	Accuracy: 72.92%
Training [83%]	Loss: 0.5839	Accuracy: 72.92%
Training [87%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5843	Accuracy: 72.92%
Training [93%]	Loss: 0.5838	Accuracy: 72.92%
Training [97%]	Loss: 0.5840	Accuracy: 72.92%
Training [100%]	Loss: 0.5837	Accuracy: 72.92%

Time taken: 623.4417991638184



Performance on test data:  
 Loss: 0.5747  
 Accuracy: 73.91%



Time taken: 623.4417991638184

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

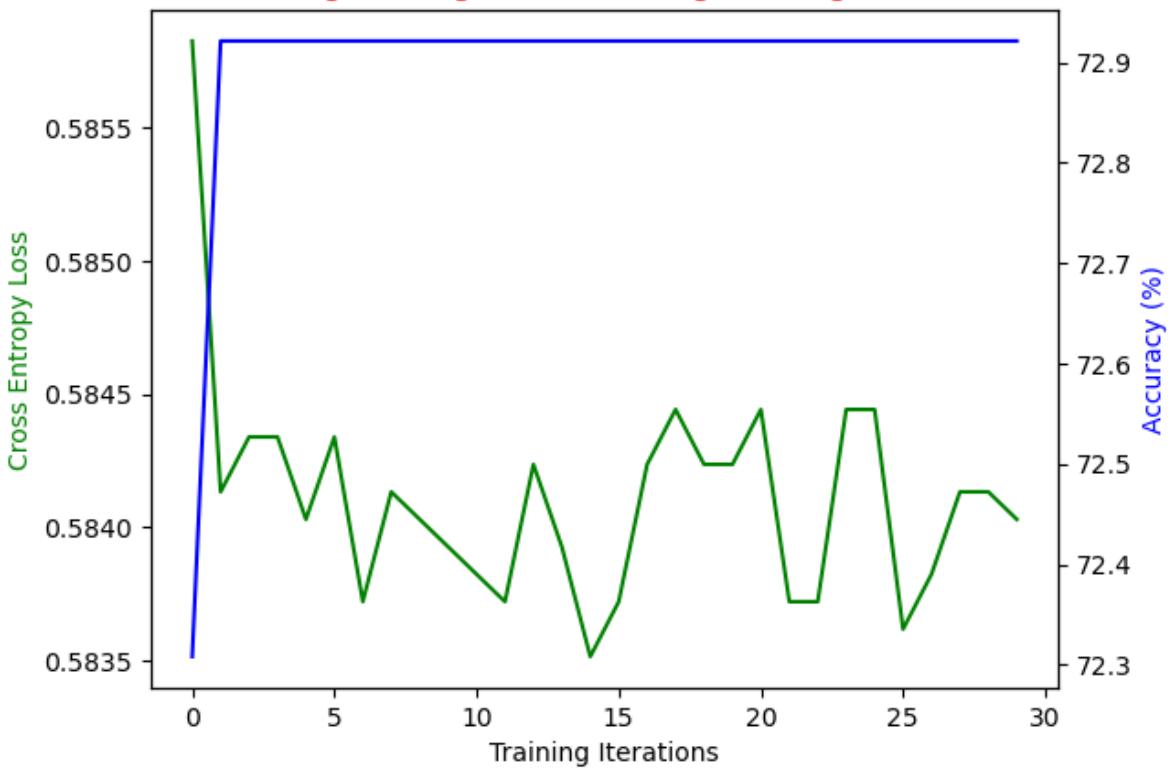
	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr0.001_optimizerAdam</b>	623.441799	0.739056	0.739056	1.0	0.849951

Data Stored Successfully  
Training with batch size: 64, epochs: 30, learning rate: 0.01, optimizer: SGD  
Current: 85/90

Training [3%]	Loss: 0.5858	Accuracy: 72.31%
Training [7%]	Loss: 0.5841	Accuracy: 72.92%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [13%]	Loss: 0.5843	Accuracy: 72.92%
Training [17%]	Loss: 0.5840	Accuracy: 72.92%
Training [20%]	Loss: 0.5843	Accuracy: 72.92%
Training [23%]	Loss: 0.5837	Accuracy: 72.92%
Training [27%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5840	Accuracy: 72.92%
Training [33%]	Loss: 0.5839	Accuracy: 72.92%
Training [37%]	Loss: 0.5838	Accuracy: 72.92%
Training [40%]	Loss: 0.5837	Accuracy: 72.92%
Training [43%]	Loss: 0.5842	Accuracy: 72.92%
Training [47%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5835	Accuracy: 72.92%
Training [53%]	Loss: 0.5837	Accuracy: 72.92%
Training [57%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5844	Accuracy: 72.92%
Training [63%]	Loss: 0.5842	Accuracy: 72.92%
Training [67%]	Loss: 0.5842	Accuracy: 72.92%
Training [70%]	Loss: 0.5844	Accuracy: 72.92%
Training [73%]	Loss: 0.5837	Accuracy: 72.92%
Training [77%]	Loss: 0.5837	Accuracy: 72.92%
Training [80%]	Loss: 0.5844	Accuracy: 72.92%
Training [83%]	Loss: 0.5844	Accuracy: 72.92%
Training [87%]	Loss: 0.5836	Accuracy: 72.92%
Training [90%]	Loss: 0.5838	Accuracy: 72.92%
Training [93%]	Loss: 0.5841	Accuracy: 72.92%
Training [97%]	Loss: 0.5841	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 602.9936096668243

### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%

Predicted 1  
Actual 1



Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 0



Predicted 1  
Actual 1



Predicted 1  
Actual 1



Real

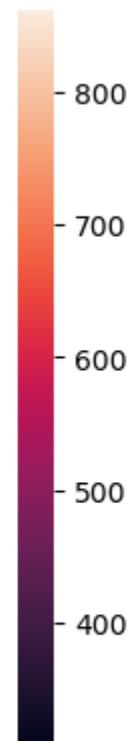
1

304

861

1

Predicted



```
Time taken: 602.9936096668243
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:
```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr0.01_optimizerSGD</b>	602.99361	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

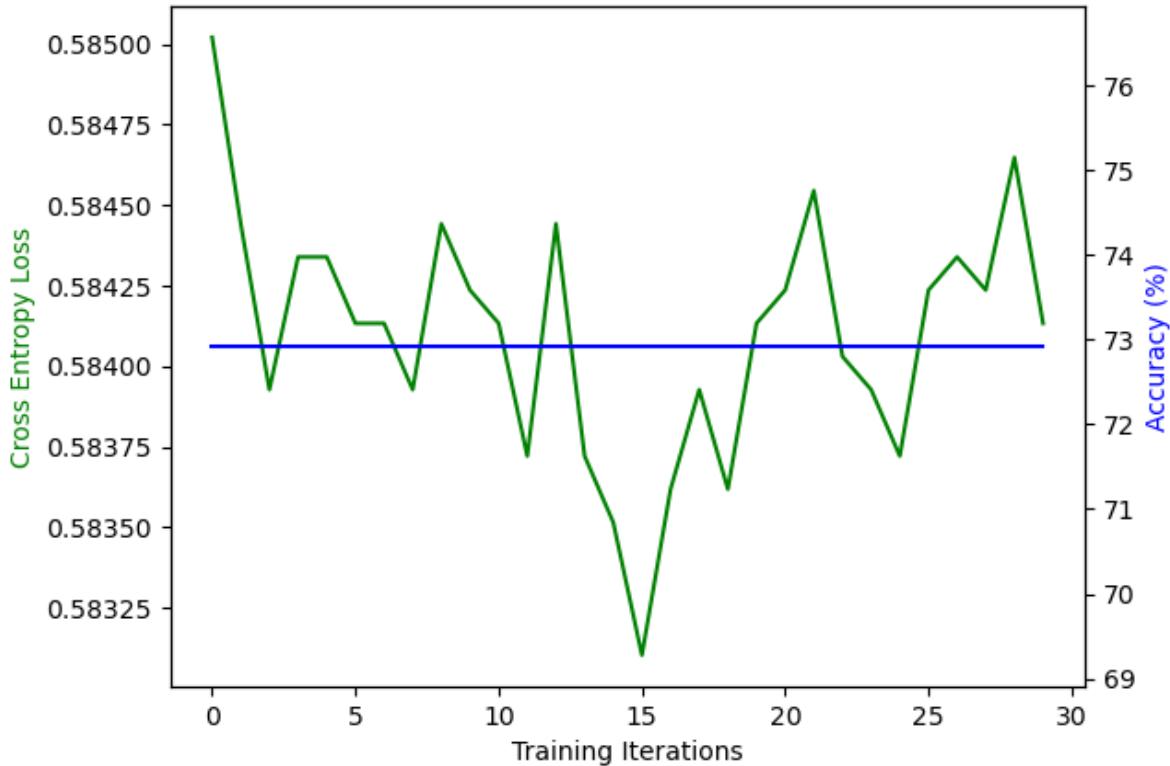
Training with batch size: 64, epochs: 30, learning rate: 0.01, optimizer: Adam

Current: 86/90

Training [3%]	Loss: 0.5850	Accuracy: 72.92%
Training [7%]	Loss: 0.5844	Accuracy: 72.92%
Training [10%]	Loss: 0.5839	Accuracy: 72.92%
Training [13%]	Loss: 0.5843	Accuracy: 72.92%
Training [17%]	Loss: 0.5843	Accuracy: 72.92%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [23%]	Loss: 0.5841	Accuracy: 72.92%
Training [27%]	Loss: 0.5839	Accuracy: 72.92%
Training [30%]	Loss: 0.5844	Accuracy: 72.92%
Training [33%]	Loss: 0.5842	Accuracy: 72.92%
Training [37%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5837	Accuracy: 72.92%
Training [43%]	Loss: 0.5844	Accuracy: 72.92%
Training [47%]	Loss: 0.5837	Accuracy: 72.92%
Training [50%]	Loss: 0.5835	Accuracy: 72.92%
Training [53%]	Loss: 0.5831	Accuracy: 72.92%
Training [57%]	Loss: 0.5836	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5836	Accuracy: 72.92%
Training [67%]	Loss: 0.5841	Accuracy: 72.92%
Training [70%]	Loss: 0.5842	Accuracy: 72.92%
Training [73%]	Loss: 0.5845	Accuracy: 72.92%
Training [77%]	Loss: 0.5840	Accuracy: 72.92%
Training [80%]	Loss: 0.5839	Accuracy: 72.92%
Training [83%]	Loss: 0.5837	Accuracy: 72.92%
Training [87%]	Loss: 0.5842	Accuracy: 72.92%
Training [90%]	Loss: 0.5843	Accuracy: 72.92%
Training [93%]	Loss: 0.5842	Accuracy: 72.92%
Training [97%]	Loss: 0.5846	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 618.9918177127838

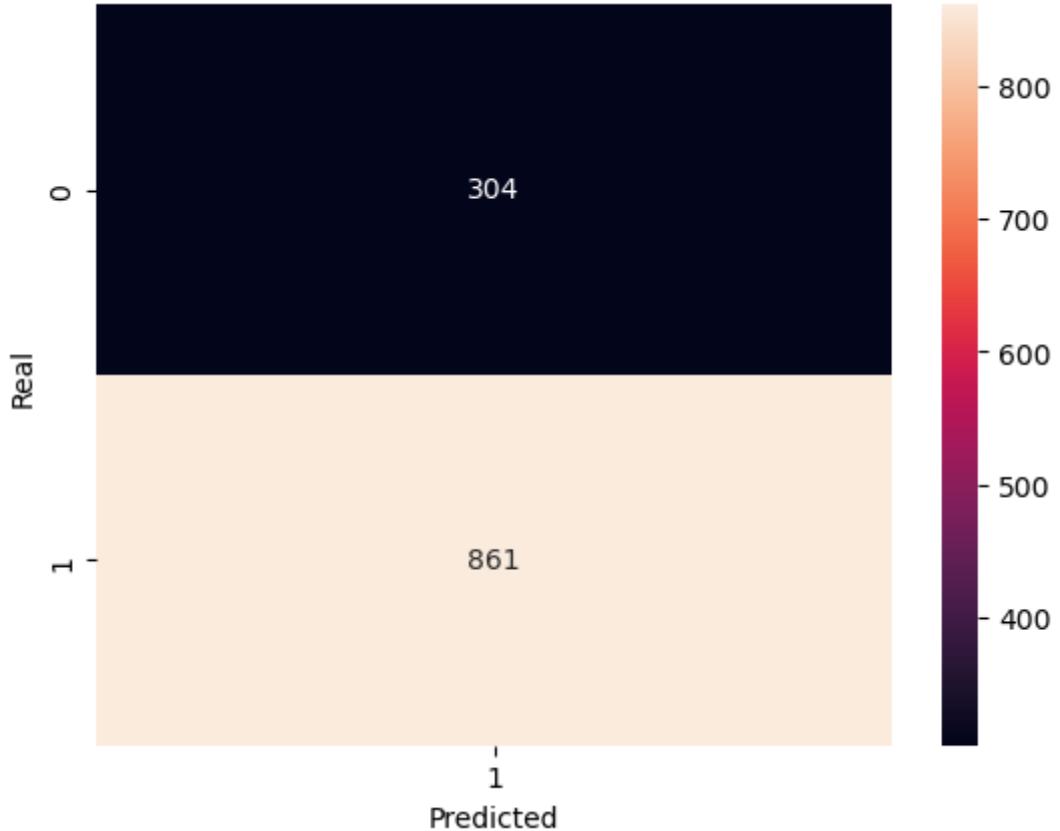
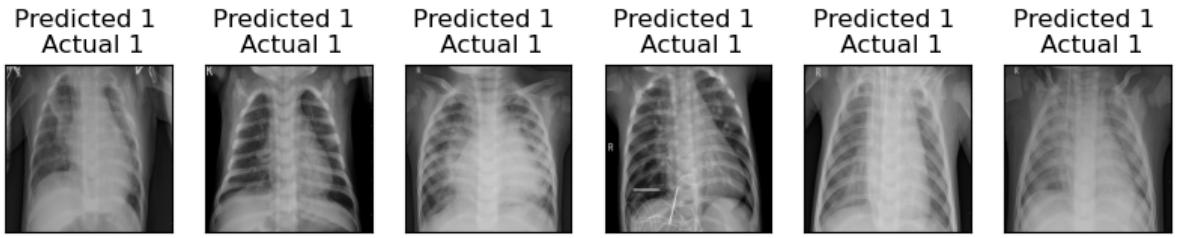
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%



Time taken: 618.9918177127838

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr0.01_optimizerAdam</b>	618.991818	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

Training with batch size: 64, epochs: 30, learning rate: 0.1, optimizer: SGD  
Current: 87/90

Training [3%]	Loss: 0.5869	Accuracy: 72.14%
Training [7%]	Loss: 0.5843	Accuracy: 72.92%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [13%]	Loss: 0.5836	Accuracy: 72.92%
Training [17%]	Loss: 0.5839	Accuracy: 72.92%
Training [20%]	Loss: 0.5837	Accuracy: 72.92%
Training [23%]	Loss: 0.5840	Accuracy: 72.92%
Training [27%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [33%]	Loss: 0.5844	Accuracy: 72.92%
Training [37%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5841	Accuracy: 72.92%
Training [43%]	Loss: 0.5836	Accuracy: 72.92%
Training [47%]	Loss: 0.5842	Accuracy: 72.92%
Training [50%]	Loss: 0.5843	Accuracy: 72.92%
Training [53%]	Loss: 0.5844	Accuracy: 72.92%
Training [57%]	Loss: 0.5845	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5841	Accuracy: 72.92%
Training [67%]	Loss: 0.5839	Accuracy: 72.92%
Training [70%]	Loss: 0.5838	Accuracy: 72.92%
Training [73%]	Loss: 0.5843	Accuracy: 72.92%
Training [77%]	Loss: 0.5839	Accuracy: 72.92%
Training [80%]	Loss: 0.5840	Accuracy: 72.92%
Training [83%]	Loss: 0.5843	Accuracy: 72.92%
Training [87%]	Loss: 0.5844	Accuracy: 72.92%
Training [90%]	Loss: 0.5837	Accuracy: 72.92%
Training [93%]	Loss: 0.5841	Accuracy: 72.92%
Training [97%]	Loss: 0.5837	Accuracy: 72.92%
Training [100%]	Loss: 0.5834	Accuracy: 72.92%

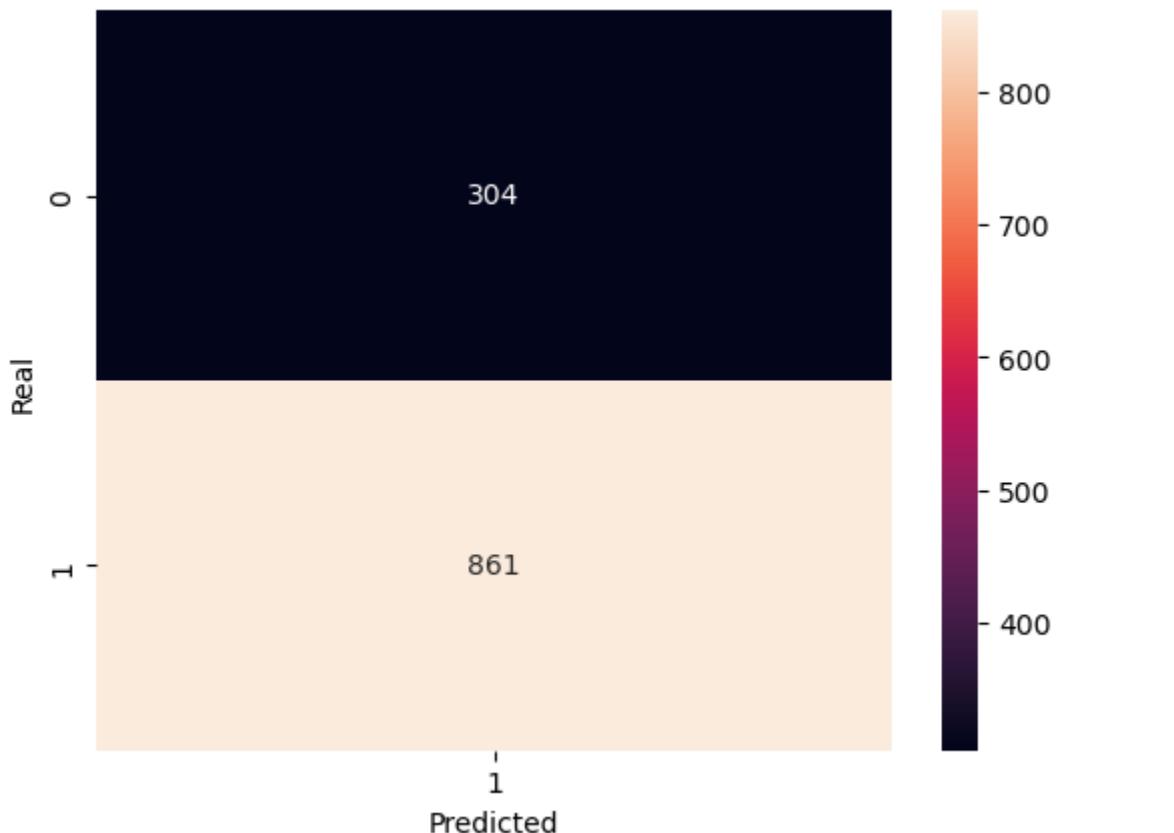
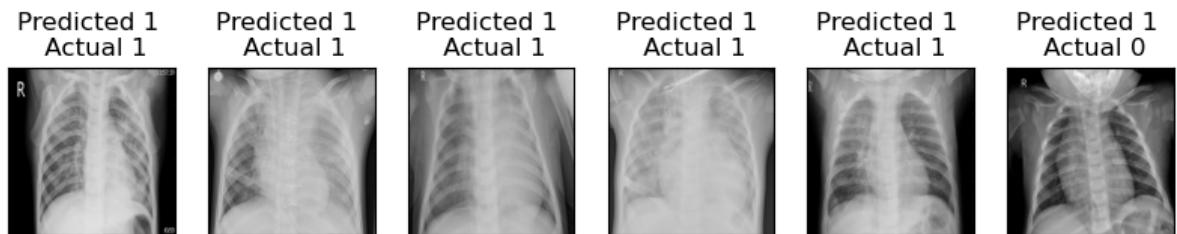
Time taken: 601.7377729415894



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%



```
Time taken: 601.7377729415894
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:
```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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0.0 in labels with no predicted samples. Use `zero_division` parameter to control
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr0.1_optimizerSGD</b>	601.737773	0.739056	0.739056	1.0	0.849951

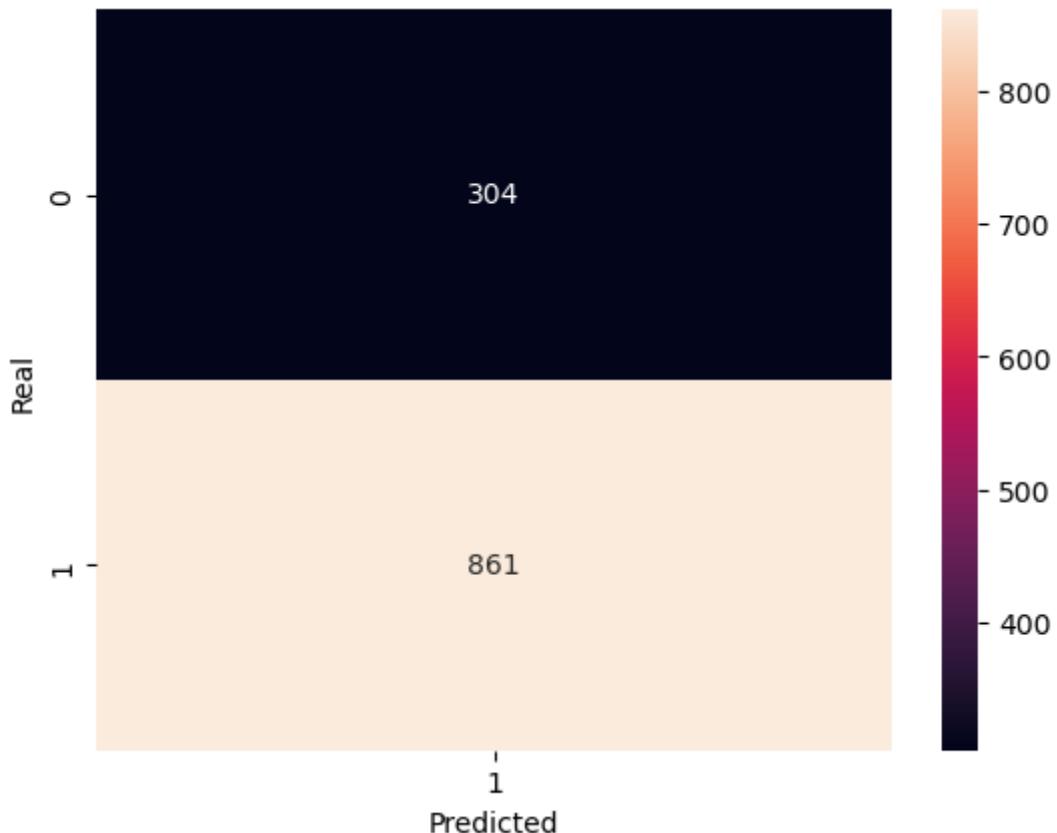
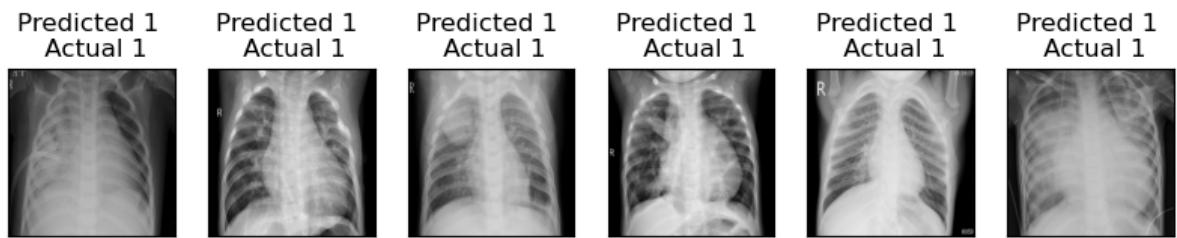
Data Stored Successfully  
 Training with batch size: 64, epochs: 30, learning rate: 0.1, optimizer: Adam  
 Current: 88/90

Training [3%]	Loss: 0.5865	Accuracy: 72.28%
Training [7%]	Loss: 0.5844	Accuracy: 72.92%
Training [10%]	Loss: 0.5846	Accuracy: 72.92%
Training [13%]	Loss: 0.5841	Accuracy: 72.92%
Training [17%]	Loss: 0.5840	Accuracy: 72.92%
Training [20%]	Loss: 0.5837	Accuracy: 72.92%
Training [23%]	Loss: 0.5843	Accuracy: 72.92%
Training [27%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5843	Accuracy: 72.92%
Training [33%]	Loss: 0.5848	Accuracy: 72.92%
Training [37%]	Loss: 0.5842	Accuracy: 72.92%
Training [40%]	Loss: 0.5848	Accuracy: 72.92%
Training [43%]	Loss: 0.5844	Accuracy: 72.92%
Training [47%]	Loss: 0.5839	Accuracy: 72.92%
Training [50%]	Loss: 0.5837	Accuracy: 72.92%
Training [53%]	Loss: 0.5851	Accuracy: 72.92%
Training [57%]	Loss: 0.5843	Accuracy: 72.92%
Training [60%]	Loss: 0.5839	Accuracy: 72.92%
Training [63%]	Loss: 0.5848	Accuracy: 72.92%
Training [67%]	Loss: 0.5844	Accuracy: 72.92%
Training [70%]	Loss: 0.5843	Accuracy: 72.92%
Training [73%]	Loss: 0.5842	Accuracy: 72.92%
Training [77%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5844	Accuracy: 72.92%
Training [83%]	Loss: 0.5835	Accuracy: 72.92%
Training [87%]	Loss: 0.5842	Accuracy: 72.92%
Training [90%]	Loss: 0.5842	Accuracy: 72.92%
Training [93%]	Loss: 0.5834	Accuracy: 72.92%
Training [97%]	Loss: 0.5837	Accuracy: 72.92%
Training [100%]	Loss: 0.5841	Accuracy: 72.92%

Time taken: 623.172290802002



Performance on test data:  
 Loss: 0.5747  
 Accuracy: 73.91%



Time taken: 623.172290802002

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr0.1_optimizerAdam</b>	623.172291	0.739056	0.739056	1.0	0.849951

Data Stored Successfully

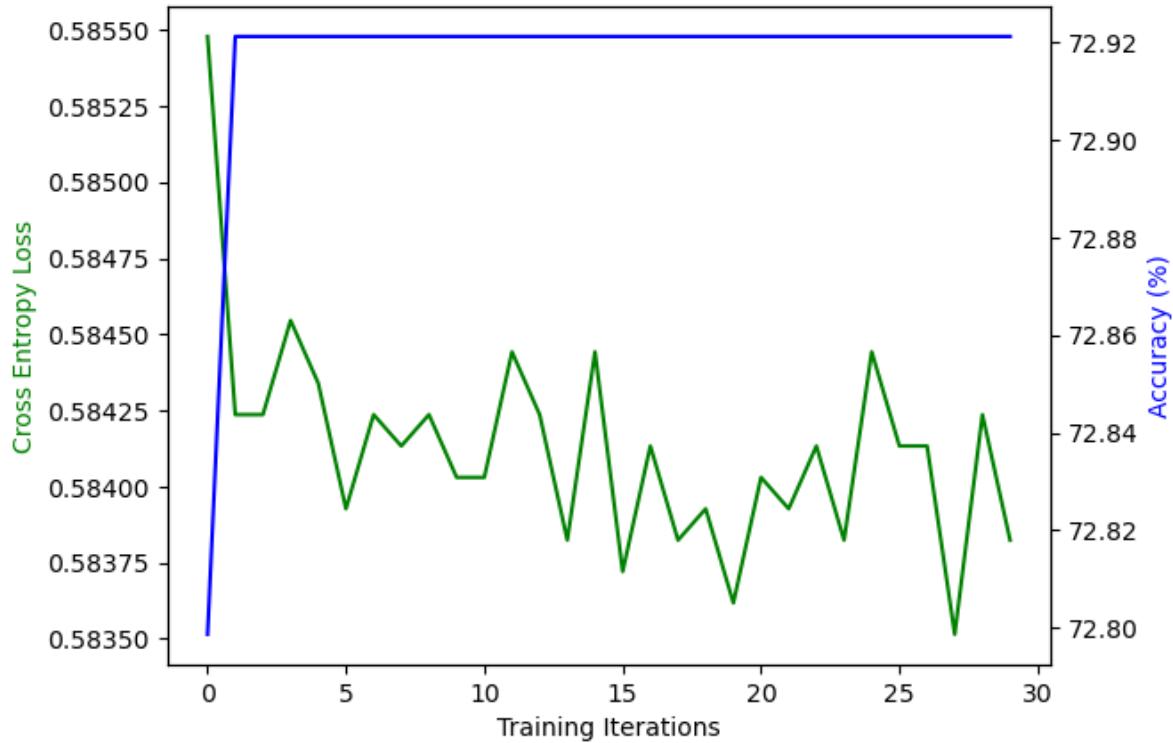
Training with batch size: 64, epochs: 30, learning rate: 1, optimizer: SGD

Current: 89/90

Training [3%]	Loss: 0.5855	Accuracy: 72.80%
Training [7%]	Loss: 0.5842	Accuracy: 72.92%
Training [10%]	Loss: 0.5842	Accuracy: 72.92%
Training [13%]	Loss: 0.5845	Accuracy: 72.92%
Training [17%]	Loss: 0.5843	Accuracy: 72.92%
Training [20%]	Loss: 0.5839	Accuracy: 72.92%
Training [23%]	Loss: 0.5842	Accuracy: 72.92%
Training [27%]	Loss: 0.5841	Accuracy: 72.92%
Training [30%]	Loss: 0.5842	Accuracy: 72.92%
Training [33%]	Loss: 0.5840	Accuracy: 72.92%
Training [37%]	Loss: 0.5840	Accuracy: 72.92%
Training [40%]	Loss: 0.5844	Accuracy: 72.92%
Training [43%]	Loss: 0.5842	Accuracy: 72.92%
Training [47%]	Loss: 0.5838	Accuracy: 72.92%
Training [50%]	Loss: 0.5844	Accuracy: 72.92%
Training [53%]	Loss: 0.5837	Accuracy: 72.92%
Training [57%]	Loss: 0.5841	Accuracy: 72.92%
Training [60%]	Loss: 0.5838	Accuracy: 72.92%
Training [63%]	Loss: 0.5839	Accuracy: 72.92%
Training [67%]	Loss: 0.5836	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [73%]	Loss: 0.5839	Accuracy: 72.92%
Training [77%]	Loss: 0.5841	Accuracy: 72.92%
Training [80%]	Loss: 0.5838	Accuracy: 72.92%
Training [83%]	Loss: 0.5844	Accuracy: 72.92%
Training [87%]	Loss: 0.5841	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [93%]	Loss: 0.5835	Accuracy: 72.92%
Training [97%]	Loss: 0.5842	Accuracy: 72.92%
Training [100%]	Loss: 0.5838	Accuracy: 72.92%

Time taken: 599.8099925518036

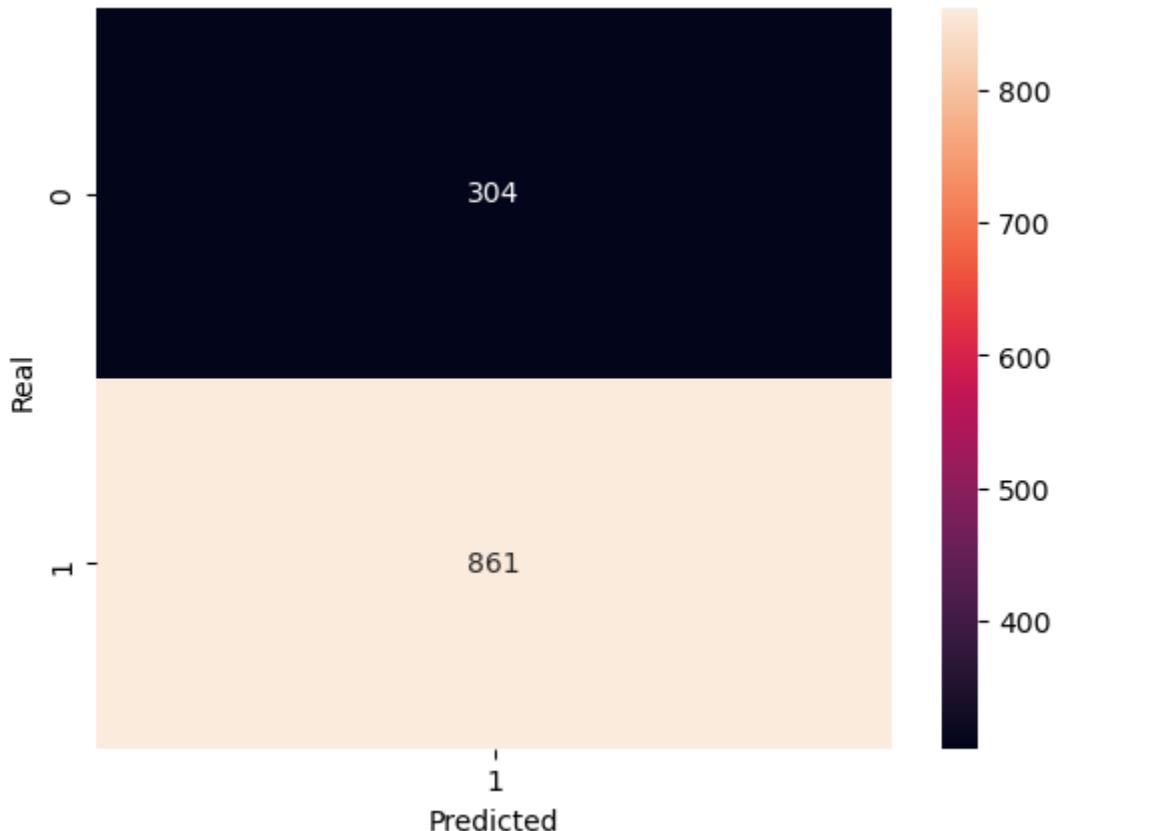
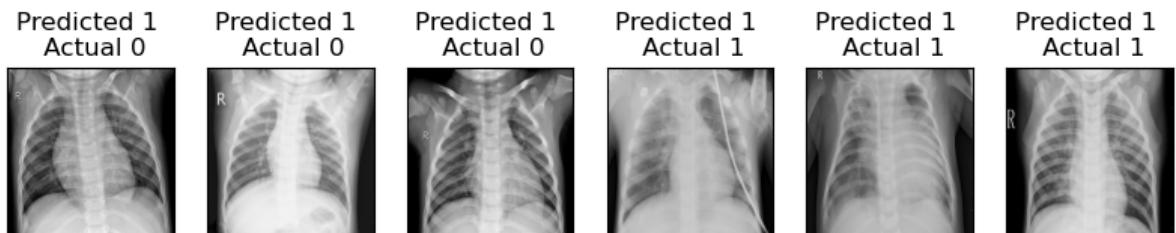
### Logistic Regression Training Convergence



Performance on test data:

Loss: 0.5747

Accuracy: 73.91%



```

Time taken: 599.8099925518036
Test size: 1165
Total Accuracy: 0.7390557939914163
Total Precision: 0.7390557939914163
Total Recall: 1.0
Total F1 Score: 0.8499506416584404
Classification Report:

```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```

c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
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1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))

```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr1_optimizerSGD</b>	599.809993	0.739056	0.739056	1.0	0.849951

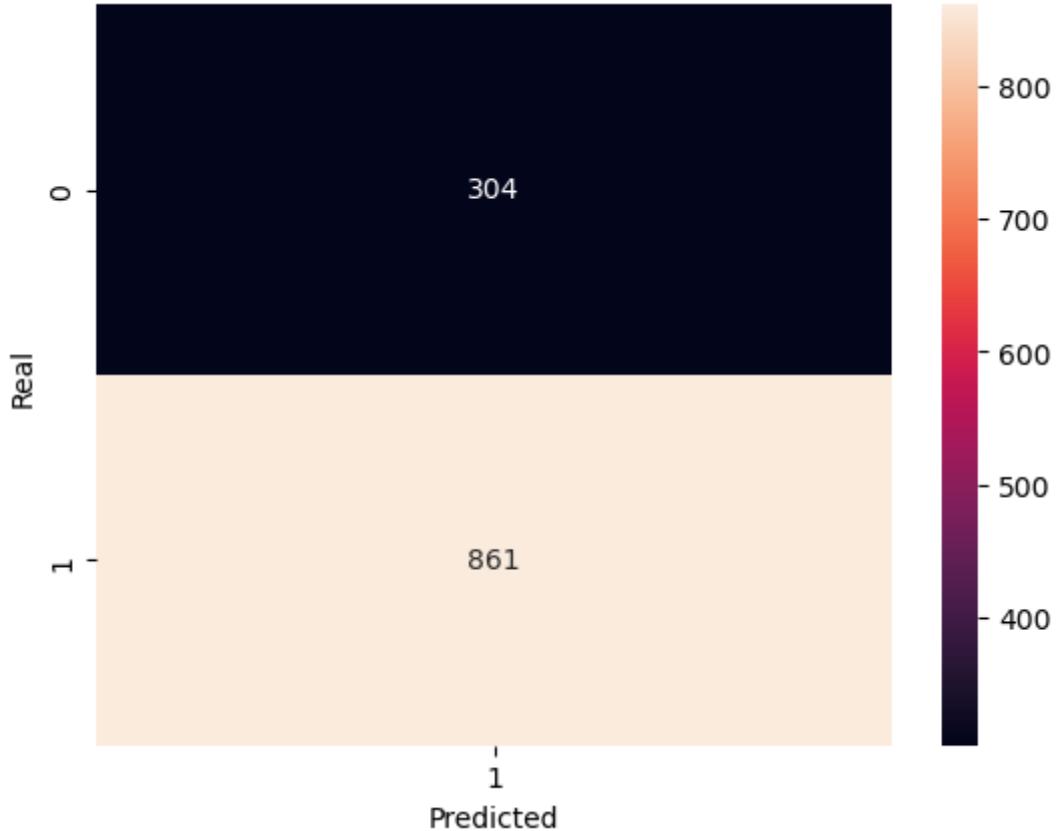
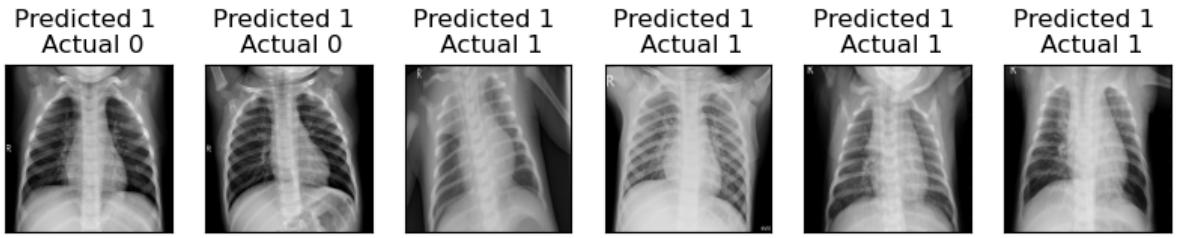
Data Stored Successfully  
 Training with batch size: 64, epochs: 30, learning rate: 1, optimizer: Adam  
 Current: 90/90

Training [3%]	Loss: 0.5868	Accuracy: 72.16%
Training [7%]	Loss: 0.5841	Accuracy: 72.92%
Training [10%]	Loss: 0.5843	Accuracy: 72.92%
Training [13%]	Loss: 0.5841	Accuracy: 72.92%
Training [17%]	Loss: 0.5835	Accuracy: 72.92%
Training [20%]	Loss: 0.5841	Accuracy: 72.92%
Training [23%]	Loss: 0.5842	Accuracy: 72.92%
Training [27%]	Loss: 0.5842	Accuracy: 72.92%
Training [30%]	Loss: 0.5837	Accuracy: 72.92%
Training [33%]	Loss: 0.5845	Accuracy: 72.92%
Training [37%]	Loss: 0.5841	Accuracy: 72.92%
Training [40%]	Loss: 0.5837	Accuracy: 72.92%
Training [43%]	Loss: 0.5841	Accuracy: 72.92%
Training [47%]	Loss: 0.5843	Accuracy: 72.92%
Training [50%]	Loss: 0.5842	Accuracy: 72.92%
Training [53%]	Loss: 0.5841	Accuracy: 72.92%
Training [57%]	Loss: 0.5842	Accuracy: 72.92%
Training [60%]	Loss: 0.5841	Accuracy: 72.92%
Training [63%]	Loss: 0.5840	Accuracy: 72.92%
Training [67%]	Loss: 0.5845	Accuracy: 72.92%
Training [70%]	Loss: 0.5840	Accuracy: 72.92%
Training [73%]	Loss: 0.5840	Accuracy: 72.92%
Training [77%]	Loss: 0.5845	Accuracy: 72.92%
Training [80%]	Loss: 0.5844	Accuracy: 72.92%
Training [83%]	Loss: 0.5838	Accuracy: 72.92%
Training [87%]	Loss: 0.5839	Accuracy: 72.92%
Training [90%]	Loss: 0.5841	Accuracy: 72.92%
Training [93%]	Loss: 0.5841	Accuracy: 72.92%
Training [97%]	Loss: 0.5835	Accuracy: 72.92%
Training [100%]	Loss: 0.5840	Accuracy: 72.92%

Time taken: 623.4913277626038



Performance on test data:  
 Loss: 0.5747  
 Accuracy: 73.91%



Time taken: 623.4913277626038

Test size: 1165

Total Accuracy: 0.7390557939914163

Total Precision: 0.7390557939914163

Total Recall: 1.0

Total F1 Score: 0.8499506416584404

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	304
1	0.74	1.00	0.85	861
accuracy			0.74	1165
macro avg	0.37	0.50	0.42	1165
weighted avg	0.55	0.74	0.63	1165

```
c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
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c:\Users\rjuya\anaconda3\Lib\site-packages\sklearn\metrics\_classification.py:147
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1: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to
0.0 in labels with no predicted samples. Use `zero_division` parameter to control
this behavior.
    _warn_prf(average, modifier, msg_start, len(result))
```

	Time	Accuracy	Precision	Recall	F1 score
<b>Logistic Regression</b> <b>model_batch64_epochs30_lr1_optimizerAdam</b>	623.491328	0.739056	0.739056	1.0	0.849951

In [ ]: