Local Update Exercise

1 From Previous Exercise

Before today's exercise, the first step is to get your code from Session 3 for synchronous SGD working. Sample code is provided.

2 Main Task

Please update your code from exercise 3 to include support for Local-Update SGD, based on the information provided in the previous tutorial. Finally, execute your program using the following configuration/setup:

```
np.random.seed(0)
X = np.random.rand(1000, 2) # 100 random 2-dimensional points
y = 7 * X[:, 0] + 1 * X[:, 1] + 10*np.random.randn(1000) # Linear
     relationship with some random noise

# Set hyperparameters
batch_size = 2048
learning_rate = 0.05
num_iterations = 100
num_workers = 4 # Number of distributed workers

# Run distributed SGD
theta, theta_history = Local_Update(X, y, batch_size,
    learning_rate, num_iterations, num_workers, num_local_steps)

# Plot the loss contour and theta values
plot_loss_contour(X, y, theta_history)
```

Report your code modification and the parameters that have the best training result:

- Batch size
- Learning Rate
- Number of workers

- Training Time Cost
- Loss Contour