05/11/2024 Ozan Cem Baş - 22102757

EEE 443 — Tutorial 2
PDF of Codes

Code Cell-2:

```
    W1 = np.random.randn(n_h, n_x) * 0.01
    b1 = np.zeros((n_h, 1))
    W2 = np.random.randn(n_y, n_h) * 0.01
    b2 = np.zeros((n_y, 1))
```

Code Cell-4:

```
    parameters['W' + str(l)] = np.random.randn(layer_dims[l], layer_dims[l-1]) * 0.01
    parameters['b' + str(l)] = np.zeros((layer_dims[l], 1))
```

Code Cell-6:

```
    Z = np.matmul(W, A) + b
```

Code Cell-8:

8.a (for ‘activation == “sigmoid”’):

```
    linear_cache, activation_cache = (A_prev, W, b), (np.matmul(W, A_prev) + b)
    A = sigmoid(activation_cache)[0]
```

8.b (for ‘activation == “relu”’):

```
    linear_cache, activation_cache = (A_prev, W, b), np.matmul(W, A_prev) + b
    A = relu(activation_cache)[0]
```

Code Cell-10:

```
    A, cache = linear_activation_forward(A_prev, parameters['W' + str(l)], parameters['b' + str(l)],
'relu')
    caches.append(cache)

    AL, cache = linear_activation_forward(A, parameters['W' + str(L)], parameters['b' + str(L)],
'sigmoid')
    caches.append(cache)
```

Code Cell-12:

```
    cost = (-1/m) * np.sum( (Y * np.log(AL)) + ((1 - Y) * np.log(1 - AL)) )
```

Code Cell-14:

```
    dA_prev = np.matmul(W.T, dZ)
    dW = (1/m) * np.matmul(dZ, A_prev.T)
    db = (1/m) * np.reshape(np.sum(dZ, axis=1), b.shape)
```

Code Cell-26:

16.a (for ‘activation == “relu”’):

```
    dZ = relu_backward(dA, activation_cache)
```

16.b (for ‘activation == “sigmoid”’):

```
    dZ = sigmoid_backward(dA, activation_cache)
```

16.c (rest of the cell):

```
    dA_prev, dW, db = linear_backward(dZ, linear_cache)
```

Code Cell-22:

```
    dAL = -(np.divide(Y, AL) - np.divide(1-Y, 1-AL))

    grads['dA' + str(L-1)], grads['dW' + str(L)], grads['db' + str(L)] = linear_activation_backward(dAL, caches[L-1], 'sigmoid')
```

(inside the for loop)

```
    dA_prev, dW, db = linear_activation_backward(grads["dA" + str(l+1)], caches[l], 'relu')
    grads['dA' + str(l)] = dA_prev
    grads['dW' + str(l + 1)] = dW
    grads['db' + str(l + 1)] = db
```

Code Cell-24:

```
    for l in range(1, L):
        parameters['W' + str(l)] -= learning_rate * grads['dW' + str(l)]
        parameters['b' + str(l)] -= learning_rate * grads['db' + str(l)]
```

Note: The cell numberings maybe shown differently. I wrote each code segment in the order given in the assignment.