# Q1

```
First instance has label Adelie, which is [0] as an integer, and [1. 0. 0.] as a list of outputs.

Predicted label for the first instance is: ['Chinstrap']
```

The output and predicted class of the first instance in the dataset using the provided weights are Chinstrap and 1 respectively.

# Q2

```
epoch =  0
Hidden layer weights
 [[-0.28371601 -0.22404428]
 [ 0.06855751  0.18754668]
 [-0.30820979  0.31106496]
 [ 0.0955662   0.00517452]]
Output layer weights
 [[-0.3013443   0.01757923  0.19865828]
 [ 0.06708725  0.11586195 -0.37290981]]
acc =  0.0
Weights after performing BP for first instance only:
Hidden layer weights:
 [[-0.28371601 -0.22404428]
 [ 0.06855751  0.18754668]
 [-0.30820979  0.31106496]
 [ 0.0955662   0.00517452]]
Output layer weights:
 [[-0.3013443   0.01757923  0.19865828]
 [ 0.06708725  0.11586195 -0.37290981]]
```

Q3

```
After training:
Hidden layer weights:
 [[ 10.44206566   9.97531015]
 [-14.05720875 -14.18713362]
 [  4.45542761   4.76356112]
 [  1.95809112   1.89836674]]
Output layer weights:
 [[2.79918324 2.9359162  3.2587298 ]
 [3.35840668 3.21665951 2.88217418]]
```

```
After testing:
Test_accuracy =  0.386508875739645
```

The accuracy is around 38%. I think more epochs will help improve that.

## Q4

My network performed worse compares to what I expected. After trained 100 epoch the accuracy is below 40%. It is not overfitted because the performance on train set and test set are alike.