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Bài Tập Thực Hành 3

Khảo Sát Bộ Dữ Liệu Chữ Số Viết Tay

Q1.

```
function q1(n)
    fprintf ('\n Load du lieu train');
    imgTrainAll = loadMNISTImages ('./train-images.idx3-
ubyte');
    lblTrainAll = loadMNISTLabels ('./train-labels.idx1-
ubyte');

    figure;
    img = imgTrainAll(:, n);
    img2D = reshape(img,28,28);
    strLabelImage = num2str (lblTrainAll (n ));
    imshow(img2D);
    title (strLabelImage);
end
```

N	1	500	5000	10000	59000
Kết quả	5	8	2	7	4

Q2.

```
function q2(n)
    fprintf ('\n Load du lieu test');
    imgTestAll = loadMNISTImages ('./t10k-images.idx3-
ubyte');
    lblTestAll = loadMNISTLabels ('./t10k-labels.idx1-
ubyte');

    figure;
    img = imgTestAll(:, n);
    img2D = reshape(img,28,28);
    strLabelImage = num2str (lblTestAll (n ));
```

```
    imshow(img2D);
    title (strLabelImage);

end
```

N	1	500	5000	9000
Kết quả	7	6	0	0

Q3.

```
function q3()
    fprintf ('\n Load du lieu train');
    imgTrainAll = loadMNISTImages ('./train-images.idx3-
ubyte');
    lblTrainAll = loadMNISTLabels ('./train-labels.idx1-
ubyte');
    count = 0;
    for j=0:9
        for i = 1 :length(lblTrainAll)
            if lblTrainAll(i) == j
                count = count + 1 ;
            end
        end
        fprintf('Nhan [%d] co: %d anh\n', j, count);
        count = 0;
    end
end
```

Kết quả:

Nhan [0] co: 5923 anh

Nhan [1] co: 6742 anh

Nhan [2] co: 5958 anh

Nhan [3] co: 6131 anh

Nhan [4] co: 5842 anh

Nhan [5] co: 5421 anh

Nhan [6] co: 5918 anh

Nhan [7] co: 6265 anh

Nhan [8] co: 5851 anh

Nhan [9] co: 5949 anh

Q4.

```matlab
function q4()
    fprintf ('\n Load du lieu test');
    imgTestAll = loadMNISTImages ('./t10k-images.idx3-ubyte');
    lblTestAll = loadMNISTLabels ('./t10k-labels.idx1-ubyte');
    count = 0;
    for j=0:9
        for i = 1 :length(lblTestAll)
            if lblTestAll(i) == j
                count = count + 1 ;
            end
        end
        fprintf('Nhan [%d] co: %d anh\n', j, count);
        count = 0;
    end
end
```

```
Kết quả:
Nhan [0] co: 980 anh
Nhan [1] co: 1135 anh
Nhan [2] co: 1032 anh
Nhan [3] co: 1010 anh
Nhan [4] co: 982 anh
Nhan [5] co: 892 anh
Nhan [6] co: 958 anh
Nhan [7] co: 1028 anh
Nhan [8] co: 974 anh
Nhan [9] co: 1009 anh
```

Q5.

```matlab
function q5(n)

    fprintf ('\n Load du lieu test');
    imgTestAll = loadMNISTImages ('./t10k-images.idx3-ubyte');
    lblTestAll = loadMNISTLabels ('./t10k-labels.idx1-ubyte');
```

```matlab
    nTestImages = size(imgTestAll, 2 ) ;
    img = imgTestAll(:,n);
    img2D = reshape(img,28,28);
    strLabelImage = num2str (lblTestAll(n));
    imshow(img2D);
    title(strLabelImage);
end
```

Kết quả:

N	5	500	900
Kết quả	4	6	8

Q6.

```matlab
function Q6(n)
    fprintf('\n Load du lieu train');
    imgTrainAll = loadMNISTImages('./train-images.idx3-
ubyte');
    lblTrainAll = loadMNISTLabels('./train-labels.idx1-
ubyte');
    Mdl = fitcknn(imgTrainAll', lblTrainAll);

    fprintf('\n Load du lieu test');
    imgTestAll = loadMNISTImages('./t10k-images.idx3-
ubyte');
    lblTestAll = loadMNISTLabels('./t10k-labels.idx1-
ubyte');


    nTrainImages = size(imgTrainAll, 2);
    nTrainLabels = size(lblTrainAll, 1);

    nTestImages = size(imgTestAll, 2);
    nTestLabels = size(lblTestAll, 1);


    imgTest = imgTestAll(:, n);
    lblPredictTest = predict(Mdl, imgTest');

    lblImgTest = lblTestAll(n);
    figure;
    img2D = reshape(imgTest, 28, 28);
```

```matlab
    imshow(img2D);

    strLabelImage = "Ban dau ";
    strLabelImage = [strLabelImage, num2str(lblTestAll(n)),
'.'];
    title(strLabelImage);

    strLabelImage = [strLabelImage, ' Du doan: '];
    strLabelImage = [strLabelImage,
num2str(lblPredictTest), '.' ];
    if(lblPredictTest == lblImgTest)
        strLabelImage = [strLabelImage, ' Ket qua dung. '];
    else
        strLabelImage = [strLabelImage, ' Ket qua sai. '];
    end
    title(strLabelImage);
end
```

Q6*.

Q7.