## i)

```
Arch=cell(numel(net.Layers),5);
for i=[2 6 10]
    l=net.Layers(i);
    Arch{i,1}=l.Name;
    Arch{i,2}='Convolution2D';
    Arch{i,3}=l.NumFilters;
    Arch{i,4}=num2str(l.FilterSize);
    Arch{i,5}=numel(l.Weights)+numel(l.Bias);
end
for i=[3 7 11]
    l=net.Layers(i);
    Arch{i,1}=l.Name;
    Arch{i,2}='BatchNOrmalization';
end
for i=[4 8 12]
    l=net.Layers(i);
    Arch{i,1}=l.Name;
    Arch{i,2}='ReLU';
end
for i=[5 9]
    l=net.Layers(i);
    Arch{i,1}=l.Name;
    Arch{i,2}='MaxPooling';
end
l=net.Layers(14);
Arch{14,1}=l.Name;
Arch{14,2}='Softmax';
l=net.Layers(15);
Arch{15,1}=l.Name;
Arch{15,2}='ClassificationOutput';
l=net.Layers(1);
Arch{1,1}=l.Name;
Arch{1,2}='ImageInput';
l=net.Layers(13);
Arch{13,1}=l.Name;
Arch{13,2}='FullyConnected';
Arch{13,5}=numel(l.Weights)+numel(l.Bias);
table(Arch)
```

ans = 15×1 table

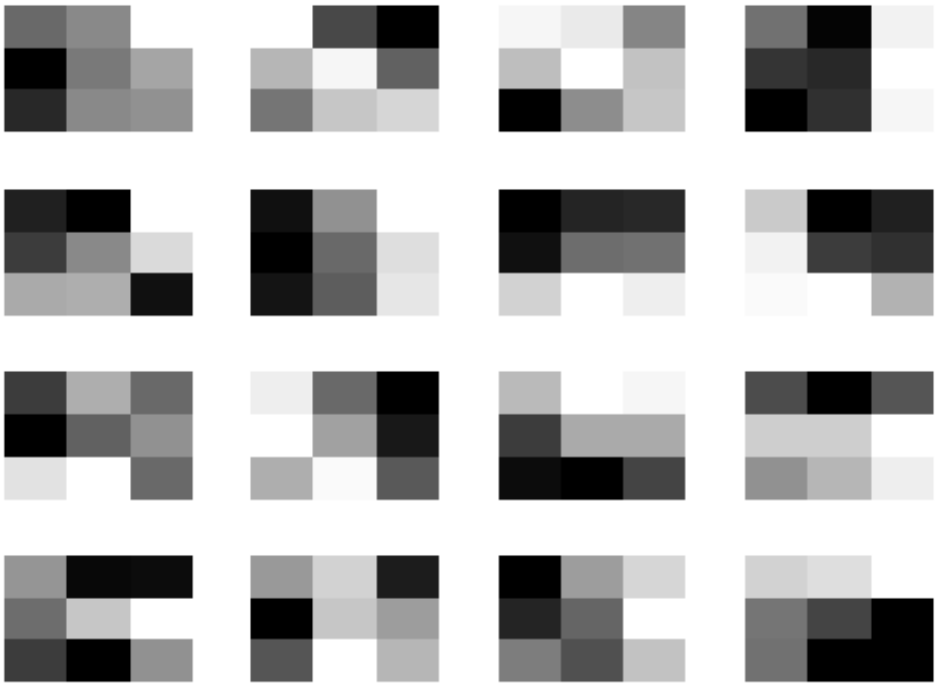
| | Arch | | | | |
|---|---|---|---|---|---|
| 1 | 'imageinput' | 'ImageInput' | [] | [] | [] |
| 2 | 'conv_1' | 'Convoluti… | 16 | '3 3' | 160 |
| 3 | 'batchnor… | 'BatchNOr… | [] | [] | [] |
| 4 | 'relu_1' | 'ReLU' | [] | [] | [] |

| | | | | | |
|---|---|---|---|---|---|
| 5 | 'maxpool_1' | 'MaxPooling' | [] | [] | [] |
| 6 | 'conv_2' | 'Convoluti… | 32 | '3 3' | 4640 |
| 7 | 'batchnor… | 'BatchNOr… | [] | [] | [] |
| 8 | 'relu_2' | 'ReLU' | [] | [] | [] |
| 9 | 'maxpool_2' | 'MaxPooling' | [] | [] | [] |
| 10 | 'conv_3' | 'Convoluti… | 64 | '3 3' | 18496 |
| 11 | 'batchnor… | 'BatchNOr… | [] | [] | [] |
| 12 | 'relu_3' | 'ReLU' | [] | [] | [] |
| 13 | 'fc' | 'FullyConn… | [] | [] | 31370 |
| 14 | 'softmax' | 'Softmax' | [] | [] | [] |
| 15 | 'classoutput' | 'Classificat… | [] | [] | [] |

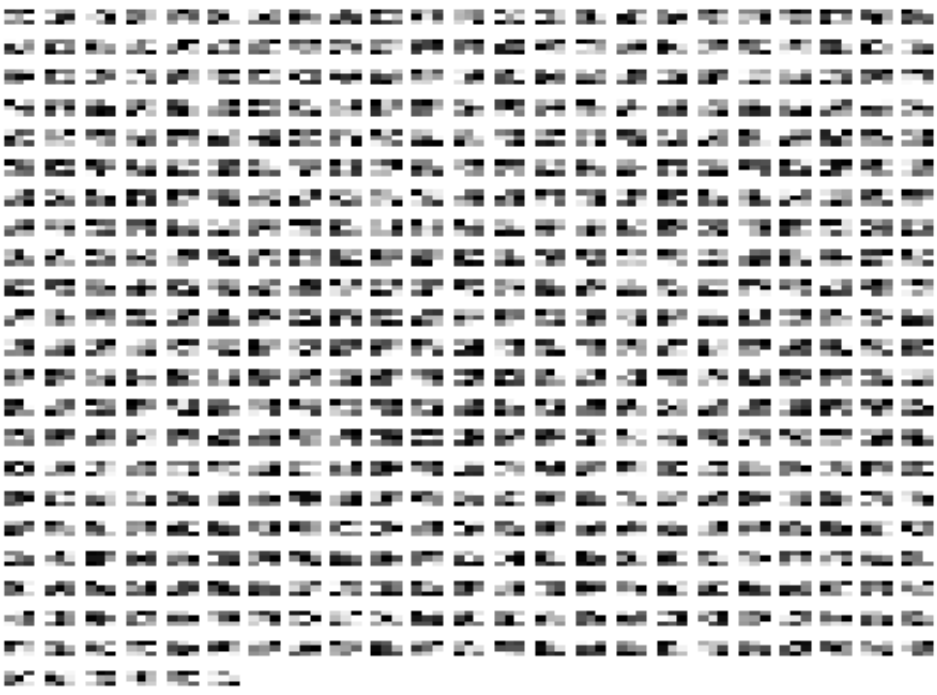
**ii)**

```
for i=[2 6 10]
    layer=net.Layers(i);
    W=layer.Weights;
    a=ceil(sqrt(size(W,3)*size(W,4)));
    figure
    l=1;
    for j=1:size(W,3)
        for k=1:size(W,4)
            subplot(a,a,l)
            imagesc(W(:,:,j,k))
            axis off
            colormap gray
            l=l+1;
        end
    end
    suptitle(['Layer Number ' num2str(i)])
end
```

Layer Number 2



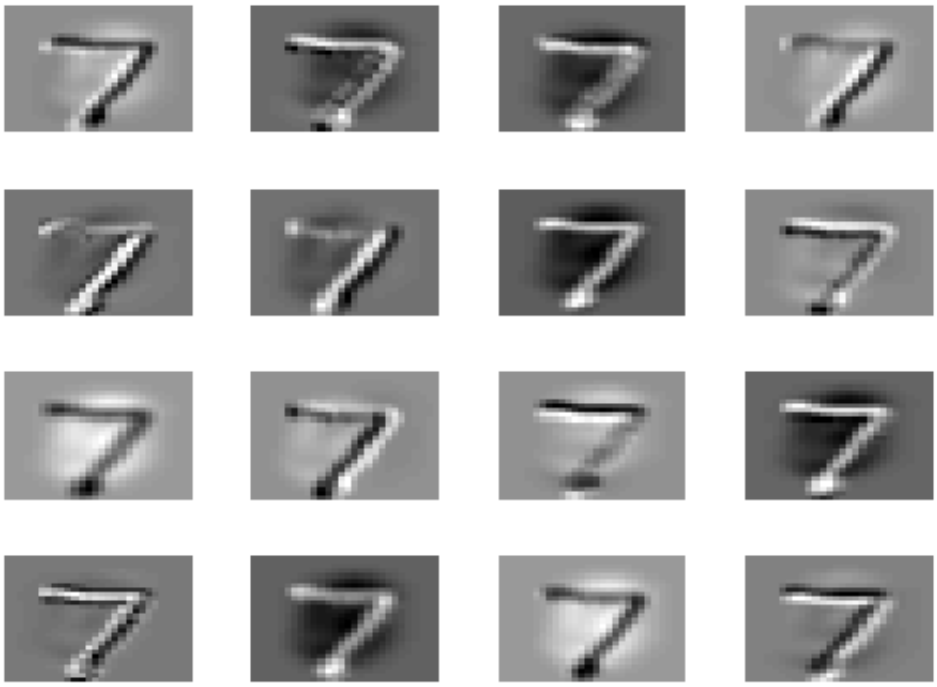
Layer Number 6



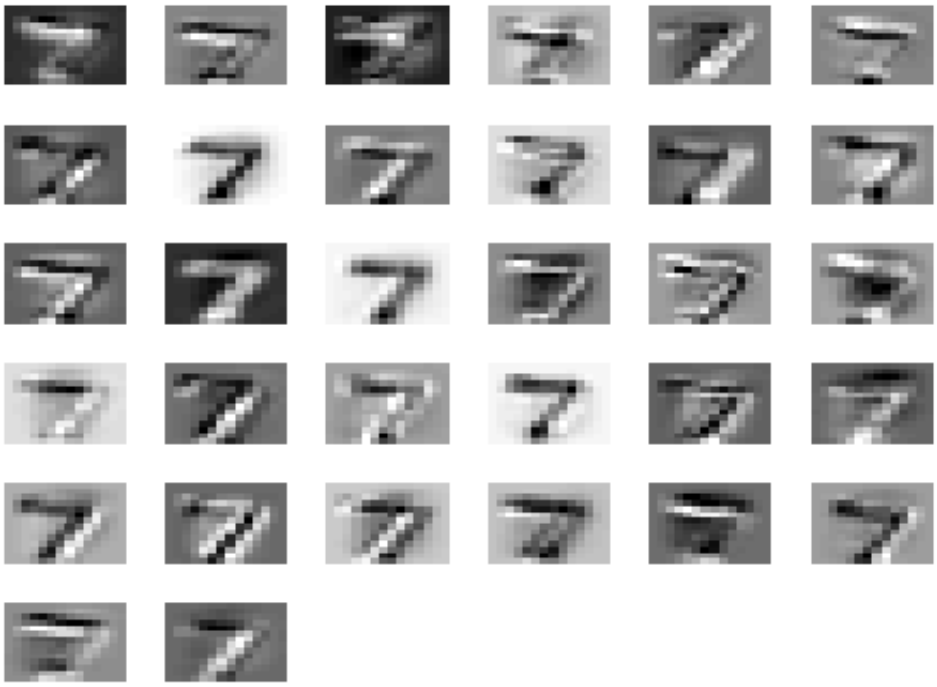

**iii)**

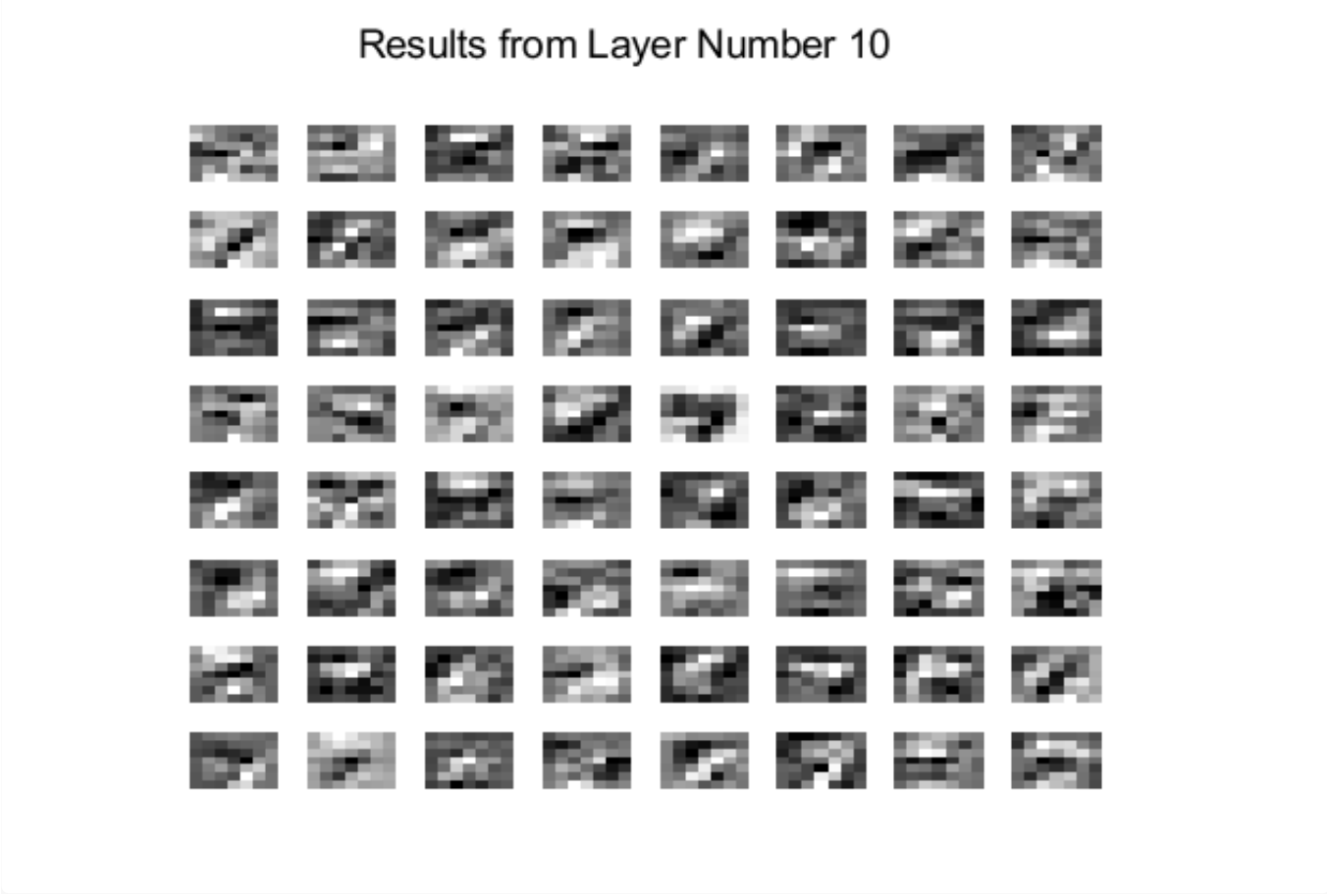
```
im=imgDataTest(:,:,1,1);
for i=[2 6 10]
    act=activations(net,im,Arch{i,1});
    a=ceil(sqrt(size(act,3)));
    figure
    for j=1:size(act,3)
        subplot(a,a,j)
        imagesc(act(:,:,j))
        axis off
        colormap gray
    end
    suptitle(['Results from Layer Number ' num2str(i)])
end
```

Results from Layer Number 2



Results from Layer Number 6



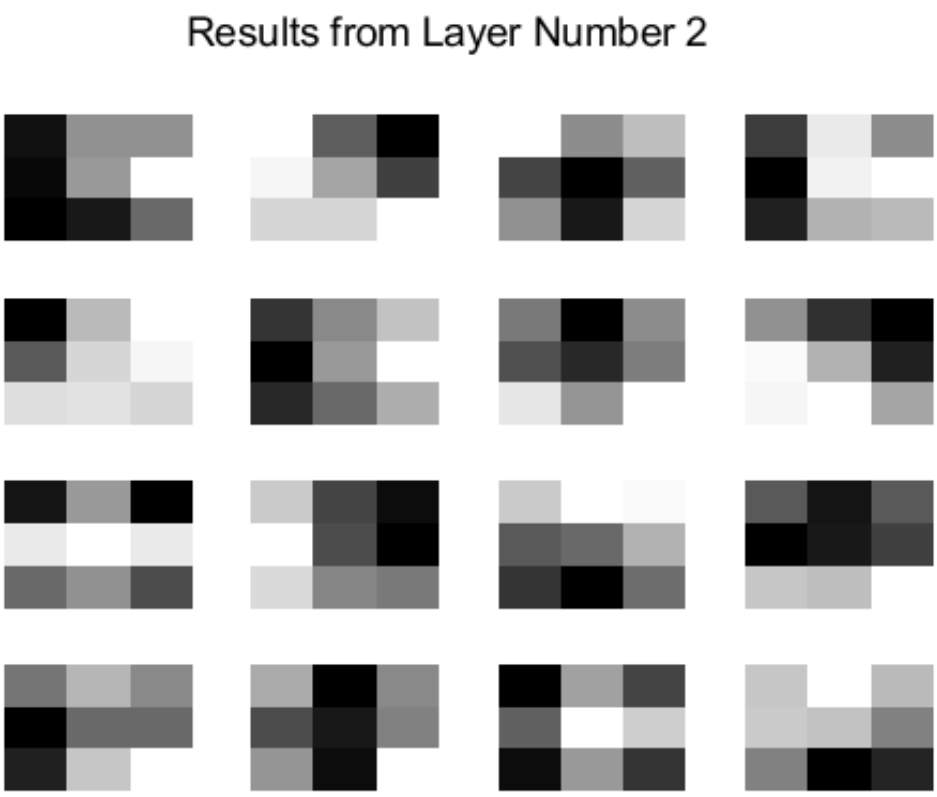



**iv)**

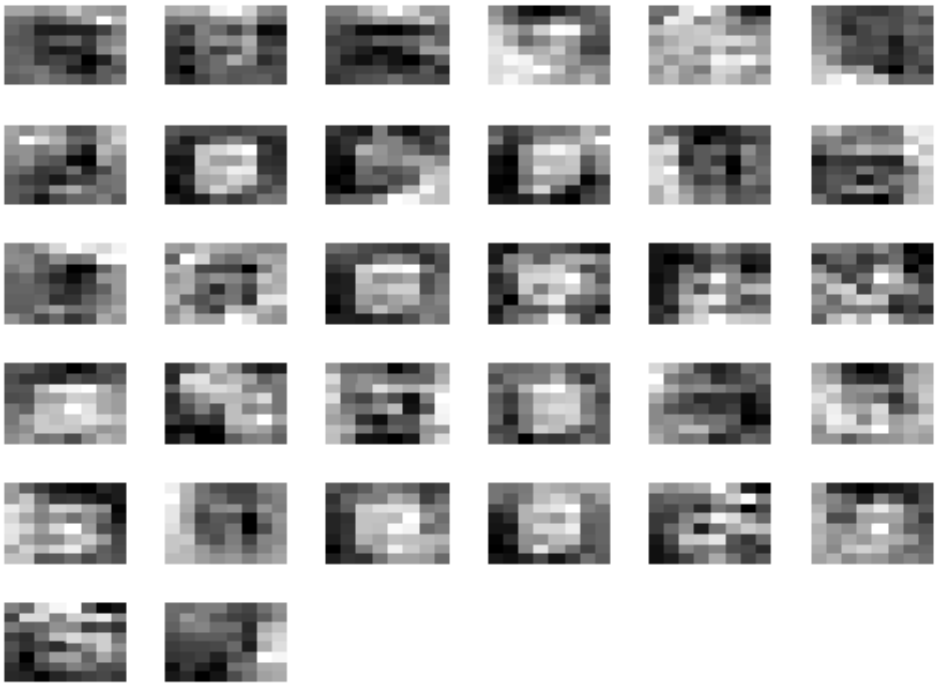
```
for i=[2 6 10]
   maxact=deepDreamImage(net,i,1:Arch{i,3},'PyramidLevels',1);
   a=ceil(sqrt(size(maxact,4)));
   figure
   for j=1:size(maxact,4)
       subplot(a,a,j)
       imagesc(maxact(:,:,1,j))
       axis off
       colormap gray
   end
   suptitle(['Results from Layer Number ' num2str(i)])
end
```

| Iteration | Activation Strength | Pyramid Level |
|---|---|---|
| 1 | 0.73 | 1 |
| 2 | 0.63 | 1 |
| 3 | 1.99 | 1 |
| 4 | 3.35 | 1 |
| 5 | 4.71 | 1 |
| 6 | 6.07 | 1 |
| 7 | 7.43 | 1 |
| 8 | 8.80 | 1 |

| | | |
|---|---|---|
| 9 | 10.16 | 1 |
| 10 | 11.52 | 1 |




| Iteration | Activation Strength | Pyramid Level |
|---|---|---|
| 1 | 0.06 | 1 |
| 2 | 0.05 | 1 |
| 3 | 0.03 | 1 |
| 4 | 0.02 | 1 |
| 5 | 0.00 | 1 |
| 6 | 0.01 | 1 |
| 7 | 0.02 | 1 |
| 8 | 0.04 | 1 |
| 9 | 0.05 | 1 |
| 10 | 0.06 | 1 |




| Iteration | Activation Strength | Pyramid Level |
|---|---|---|
| 1 | 0.05 | 1 |
| 2 | 0.09 | 1 |
| 3 | 0.13 | 1 |
| 4 | 0.16 | 1 |
| 5 | 0.18 | 1 |
| 6 | 0.21 | 1 |
| 7 | 0.23 | 1 |
| 8 | 0.25 | 1 |
| 9 | 0.27 | 1 |
| 10 | 0.29 | 1 |

Results from Layer Number 10