

ASSIGNMENT 3- REPORT

ON

Convolutional Neural Network

By

Anmol Agrawal- T21045

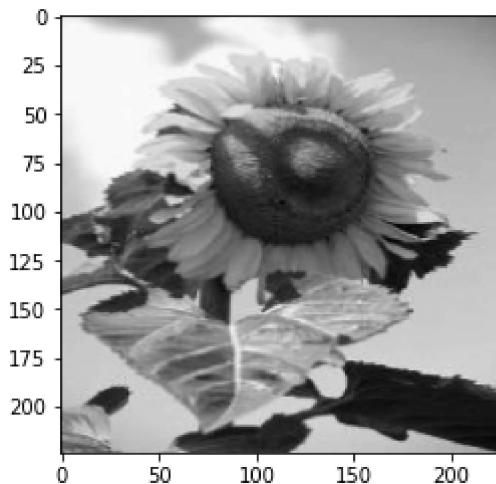
Lakshay Bansal - T21011

Rajan Shukla - T21016

Instructor: Prof. Dileep A D

Q1

Input Image:



$$W = 224$$

$$H = 224$$

$$K = 1$$

Now calculating the size of Feature Map

$$W' = (W - F + 2 * P) / S + 1 \Rightarrow (224 - 3 + 0) / 1 + 1 \Rightarrow 222$$

$$H' = (H - F + 2 * P) / S + 1 \Rightarrow (224 - 3 + 0) / 1 + 1 \Rightarrow 222$$

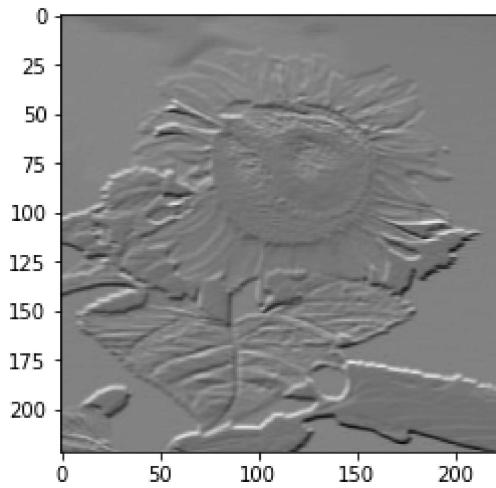
$$K' = K$$

Kaiming Filter:

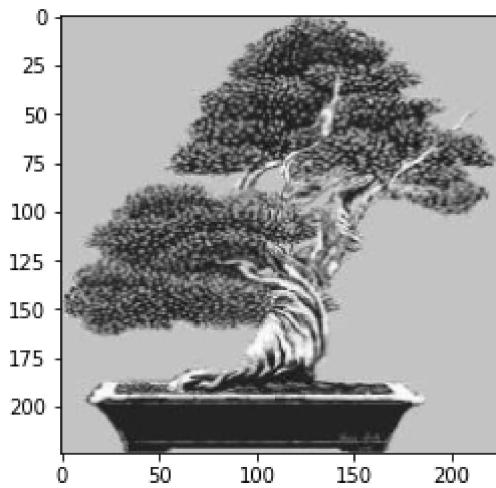
0.35329173	-0.73563673	-2.31898505
-0.16918929	-1.05448701	3.16724281
2.13333409	-0.48047141	-0.50799771

Feature Map Output Size $(1, 222, 222)$ i.e $W = 222, H = 222, K = 1$

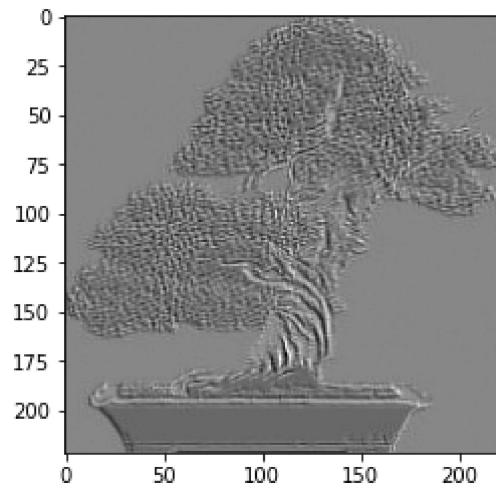
Which Comes Out to be same as we have calculated.



SECOND CLASS “Bonsai”: Input Image

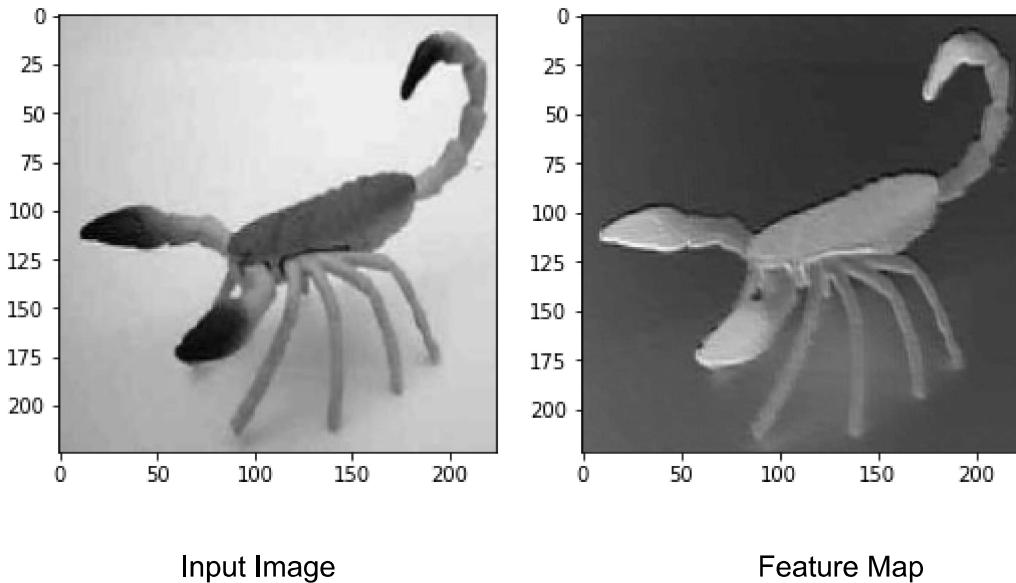


Input Image



Feature Map

Third CLASS “Scorpio”: Input Image



Q2

For Layer One With $K = 32$

$P = 0$, $F = 3$

$W = 224$

$H = 224$

$K = 32$

Now calculating the size of Feature Map

$$W' = (W - F + 2 * P) / S + 1 \Rightarrow (224 - 3 + 0) / 1 + 1 \Rightarrow 222$$

$$H' = (H - F + 2 * P) / S + 1 \Rightarrow (224 - 3 + 0) / 1 + 1 \Rightarrow 222$$

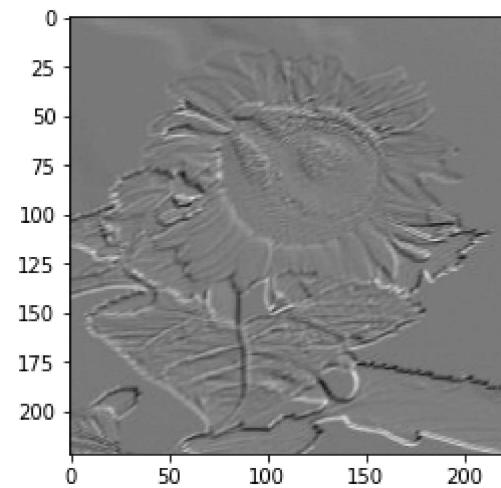
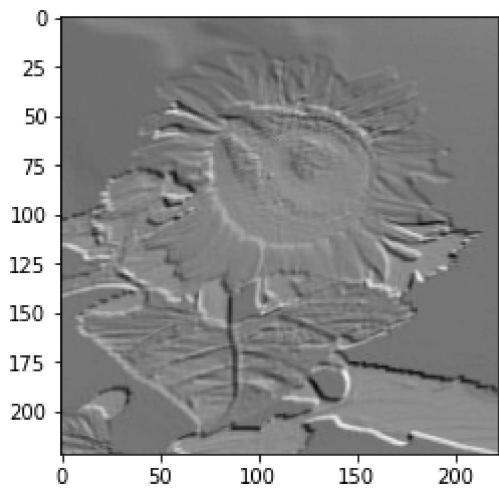
$$K' = K$$

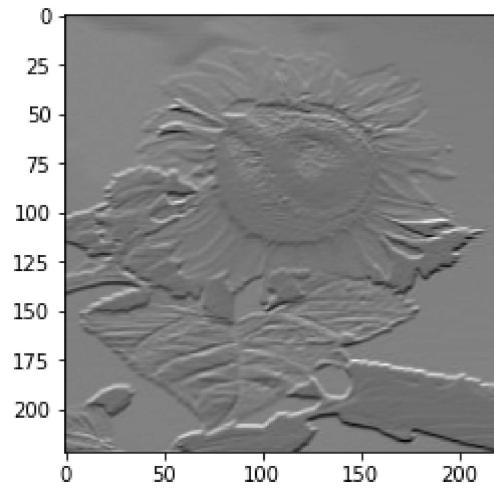
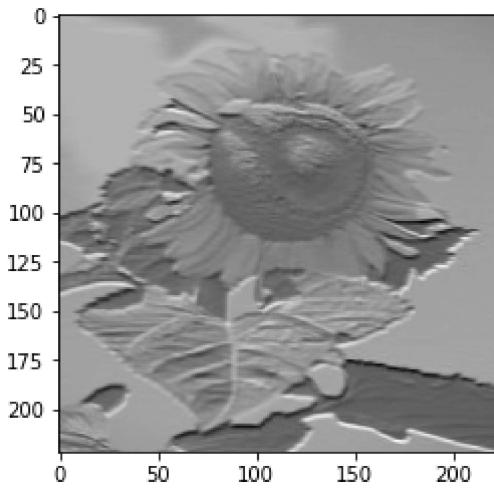
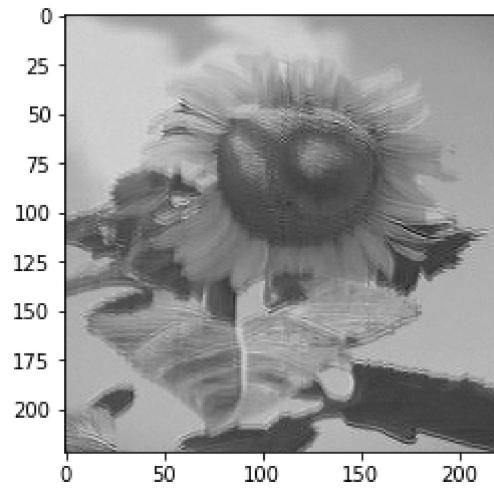
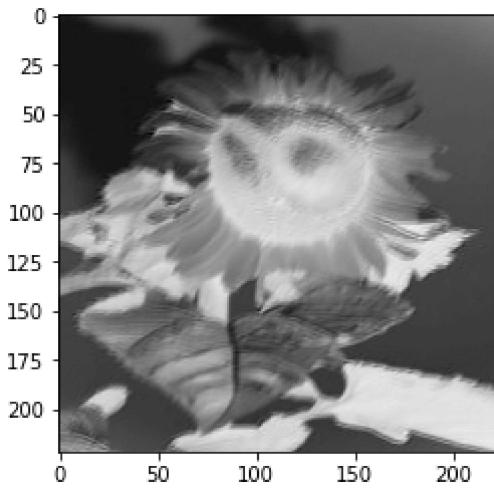
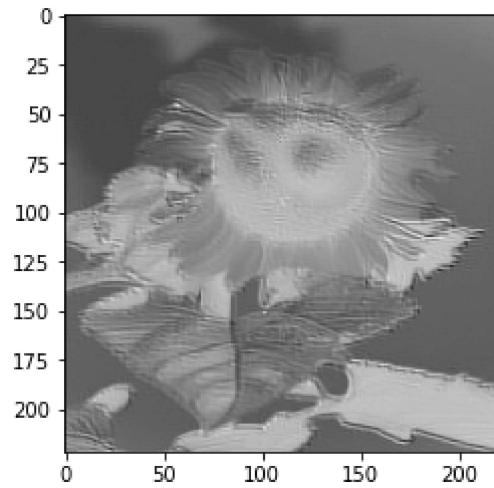
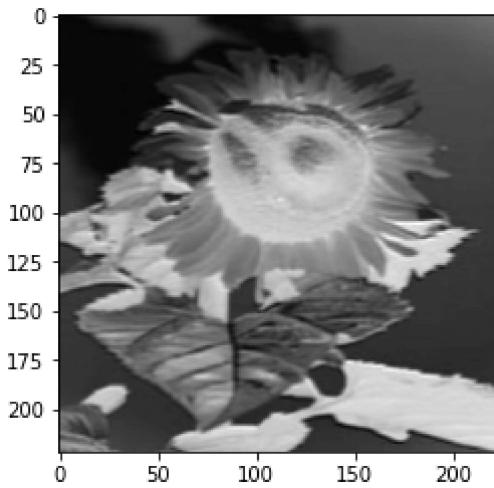
Feature Map Output Size $(32, 222, 222)$ i.e $W = 222$, $H = 222$, $K = 1$

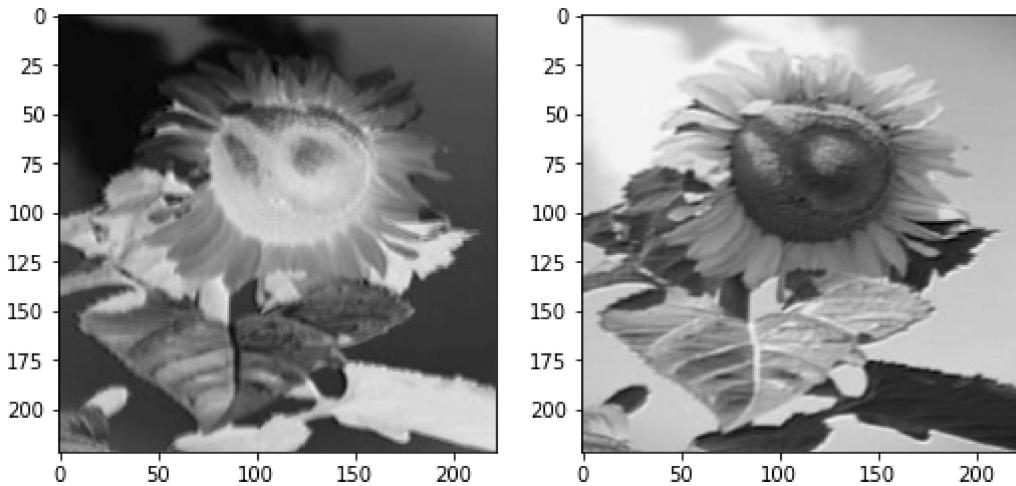
Which Comes Out to be same as we have calculated. Now plotting the 10 Feature Maps.

Kaiming Filters:

0.3856443	1.34154668	-0.40512901
-1.78428199	0.87344939	0.12842801
2.06206298	-0.44322205	-1.89833317







Q2 With Two Layers of CNN

For Layer One With K = 64

P = 0 ,F = 3

W = 222

H = 222

K = 64

Now calculating the size of Feature Map

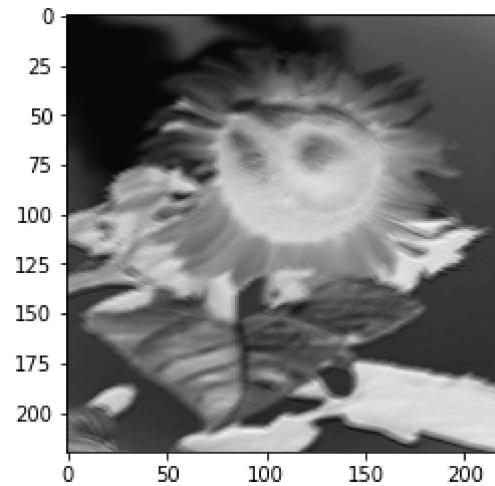
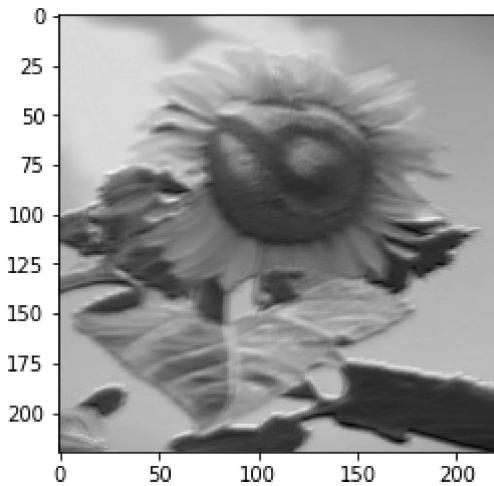
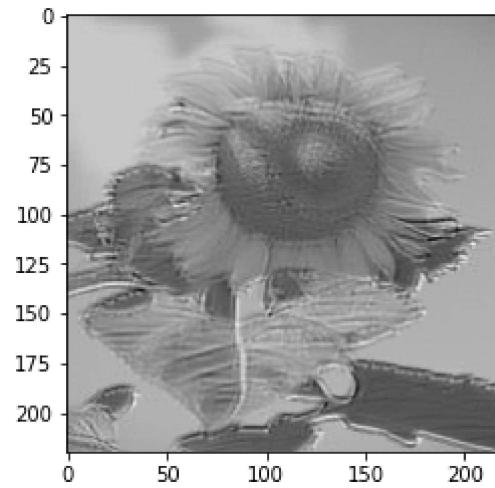
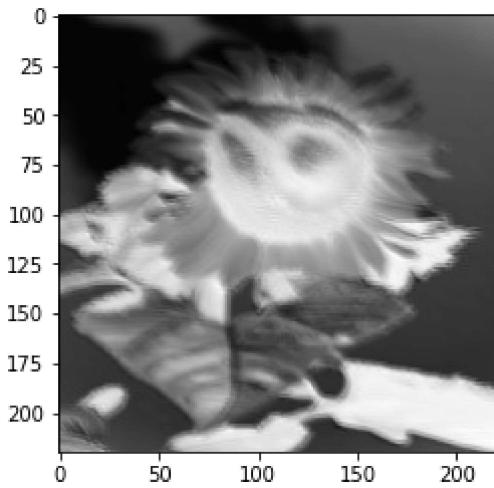
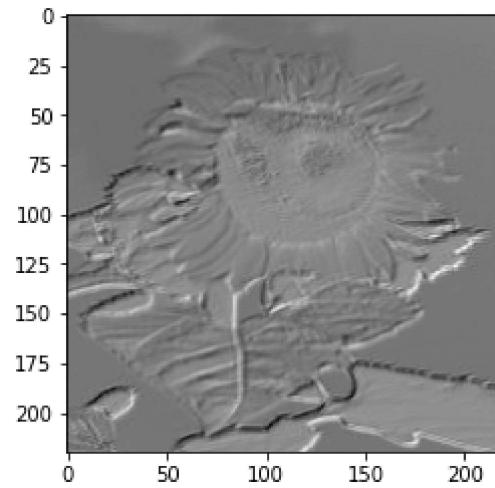
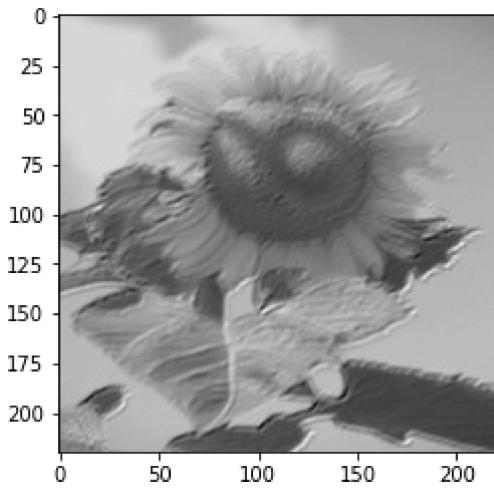
$$W' = (W - F + 2P)/S + 1 \Rightarrow (222 - 3 + 0)/1 + 1 \Rightarrow 220$$

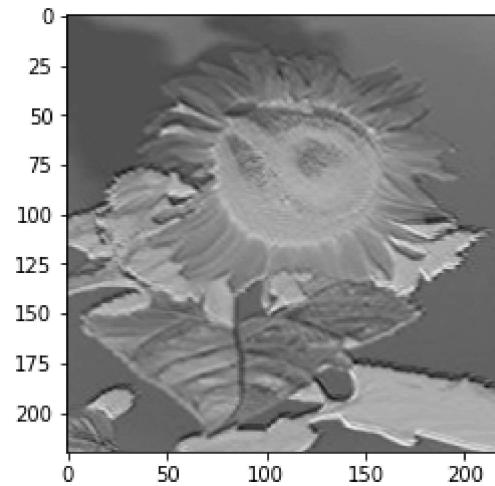
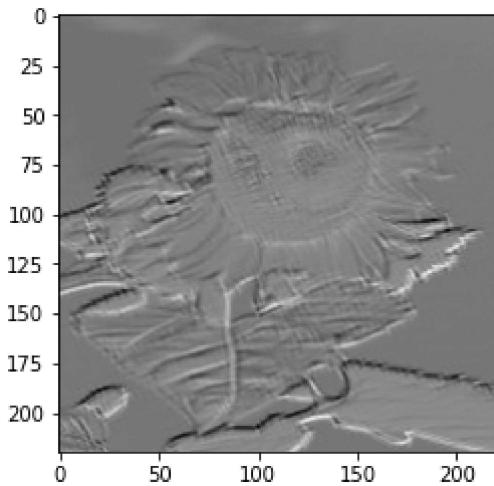
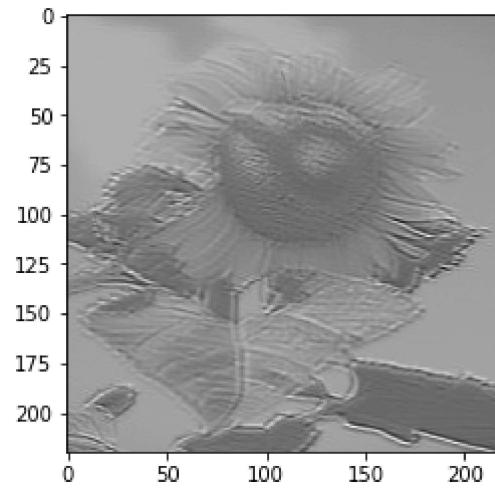
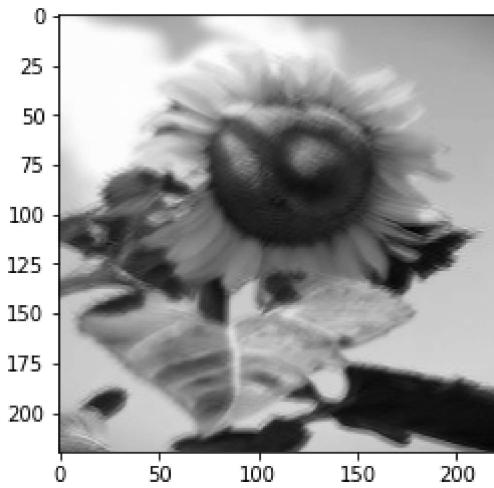
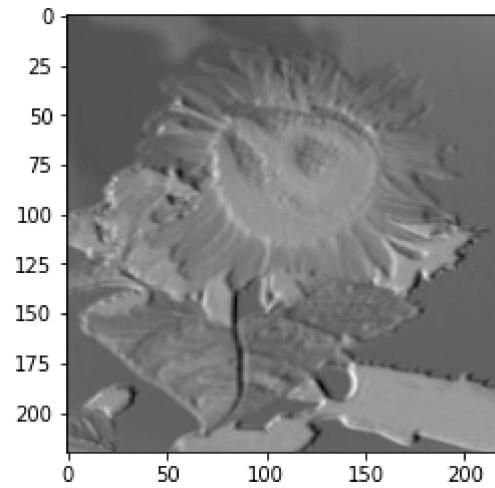
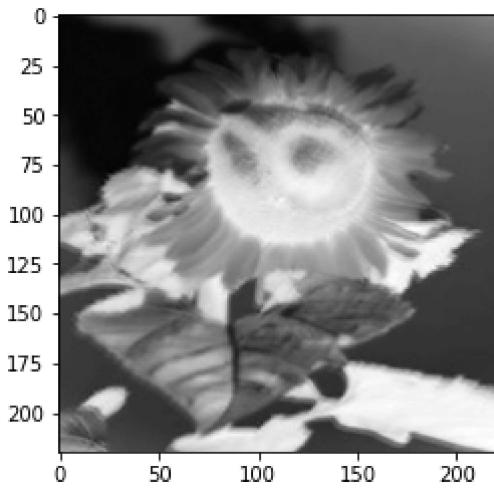
$$H' = (H - F + 2P)/S + 1 \Rightarrow (222 - 3 + 0)/1 + 1 \Rightarrow 220$$

$$K' = K$$

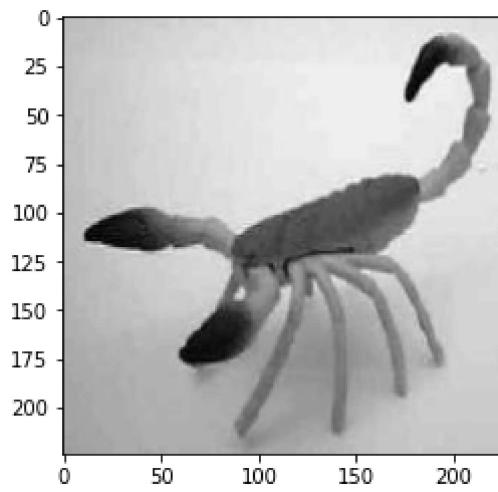
Feature Map Output Size $(32, 220, 220)$ i.e W = 220, H = 220 , K = 1

Which Comes Out to be same as we have calculated. Now plotting the 10 Feature Maps.

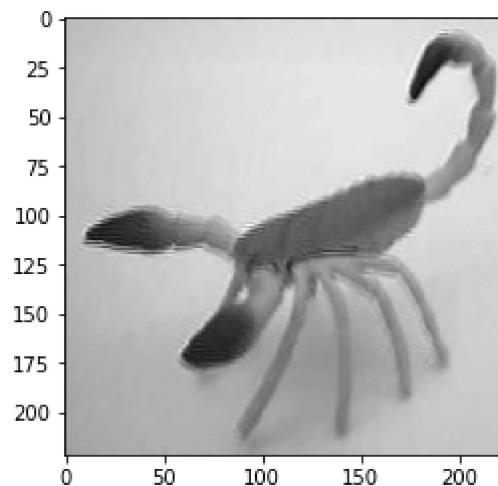
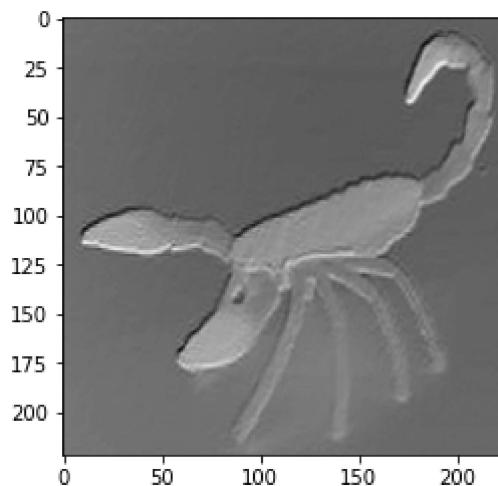
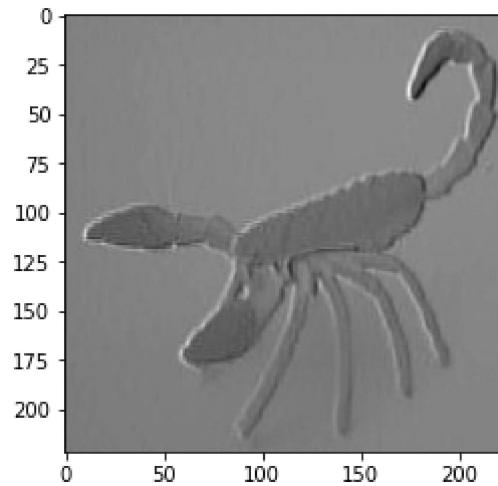
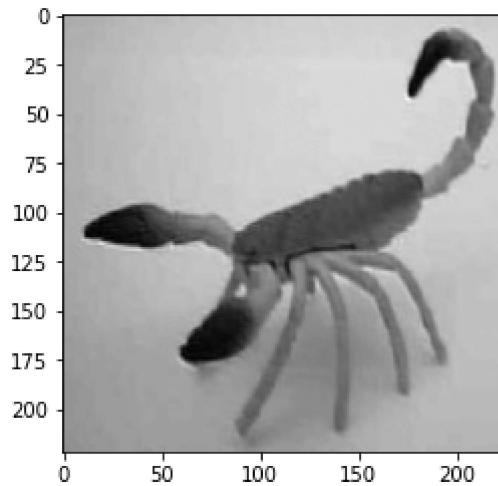


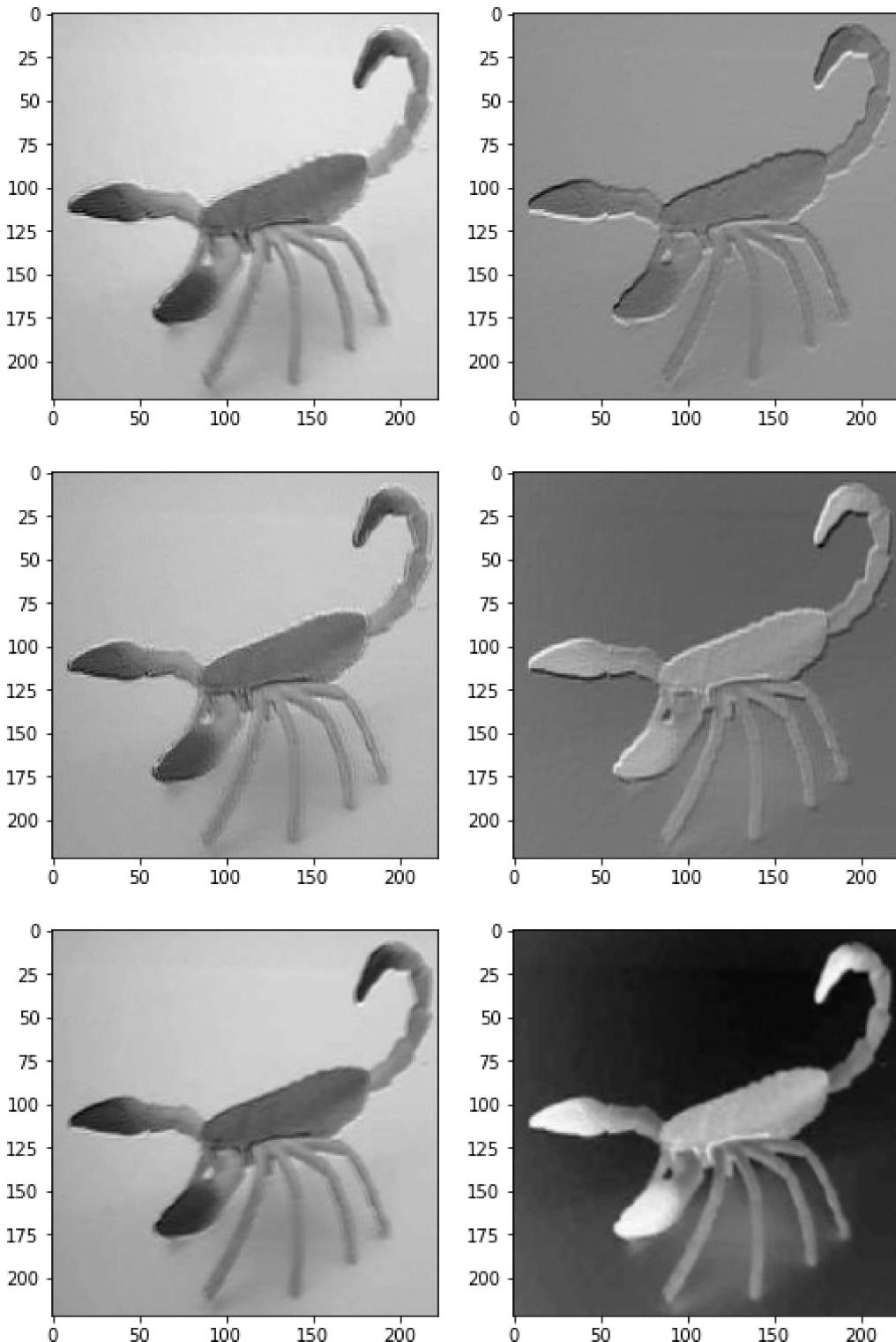


Now For Class “Scorpio”

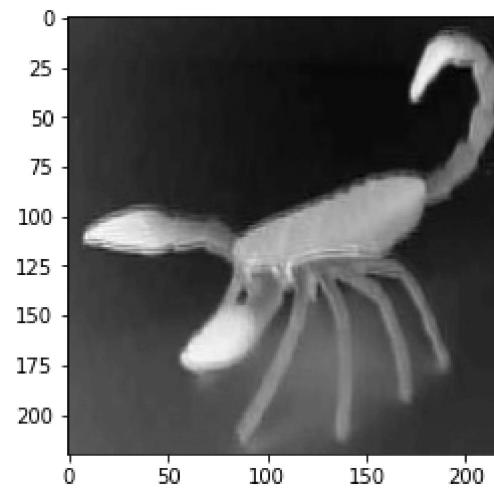
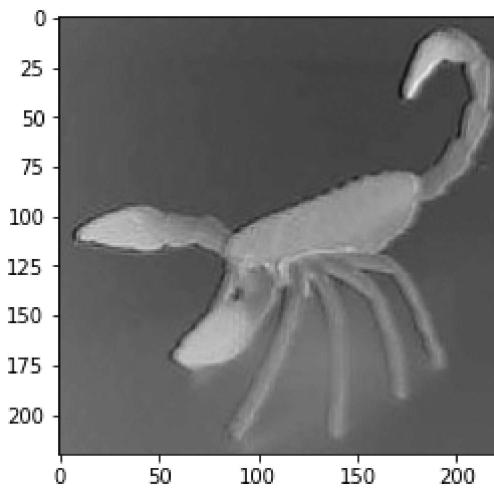
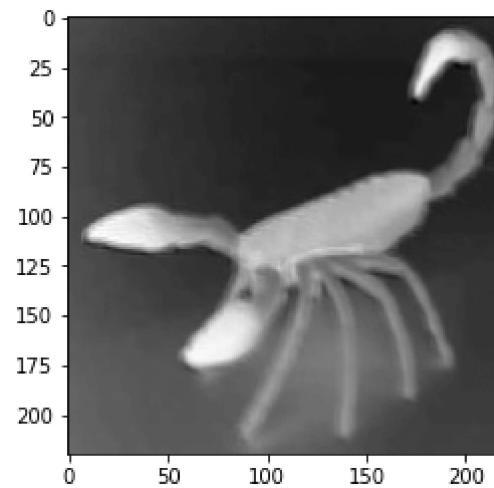
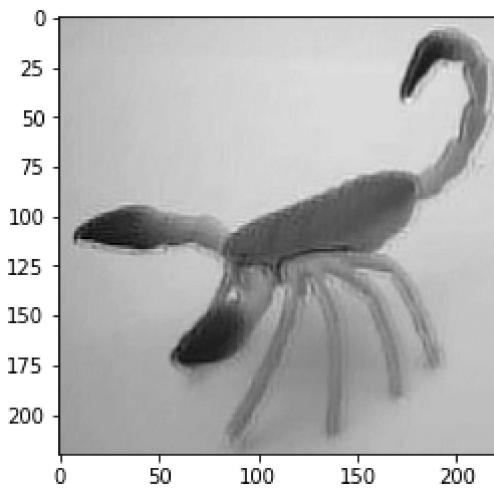
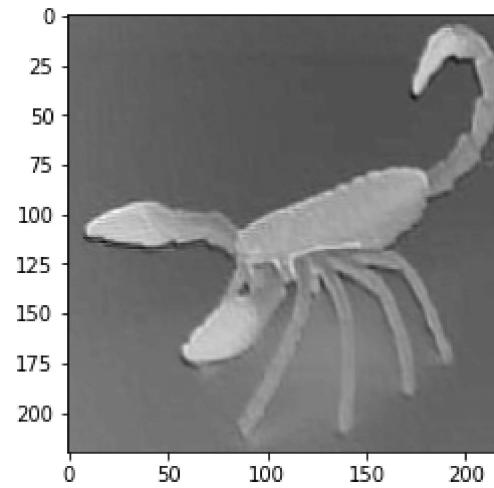
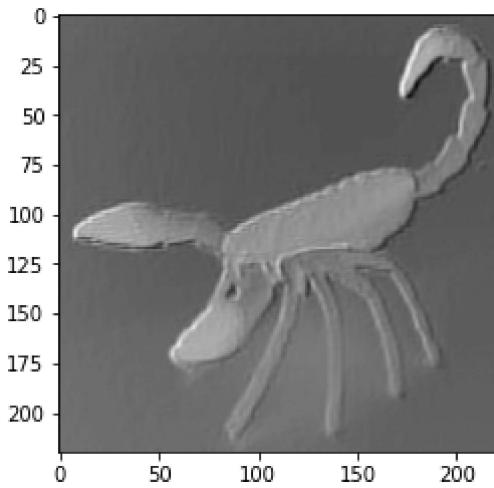


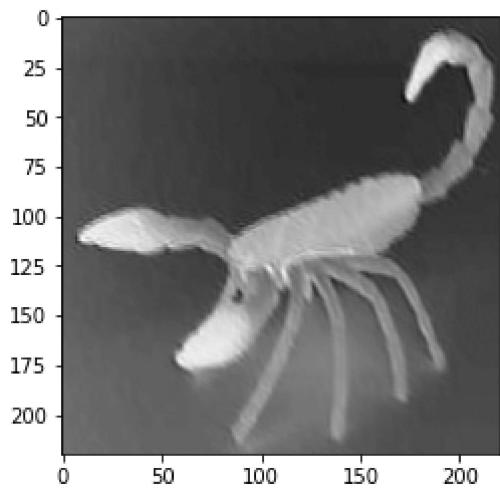
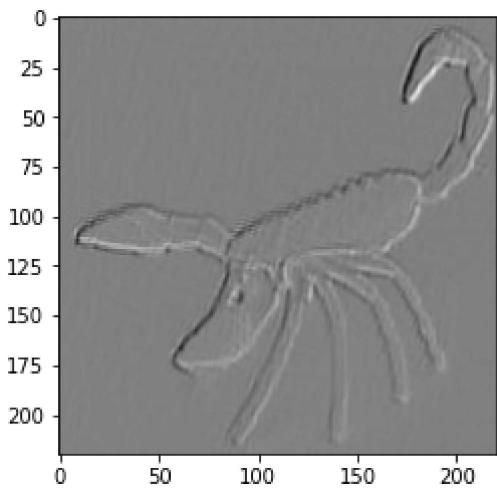
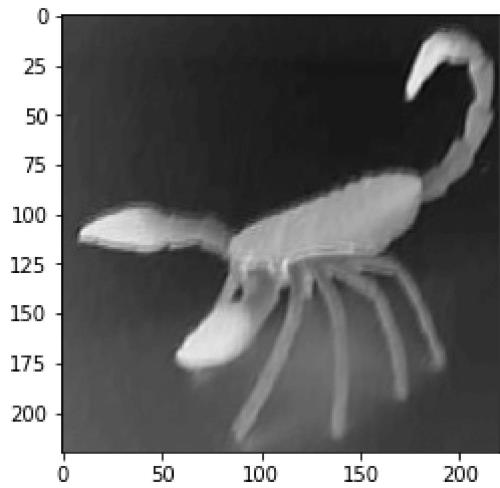
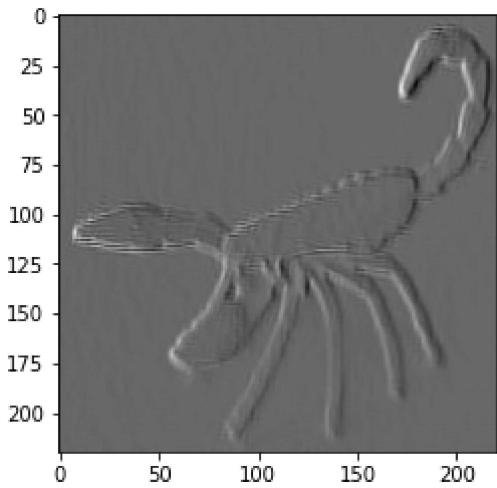
Feature Maps Plot For Layer 1:



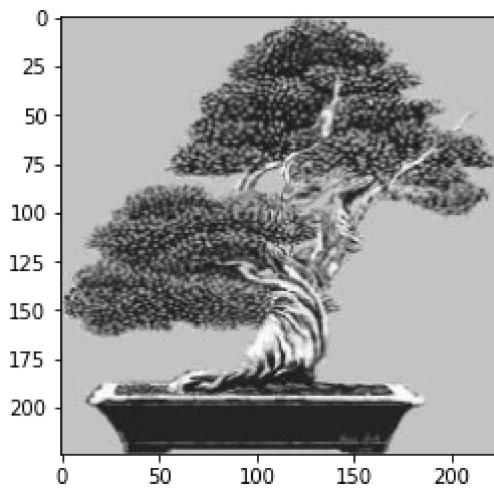


Feature Maps Plot For Layer 2:

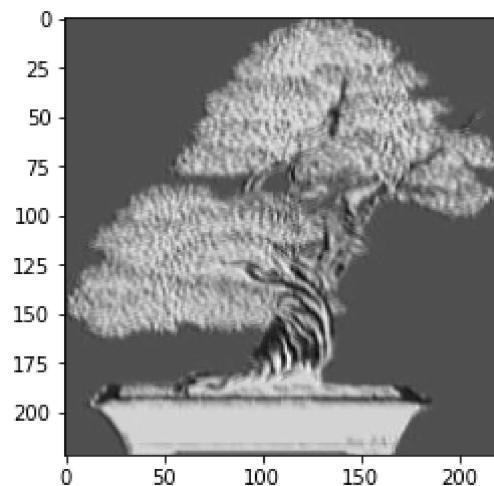
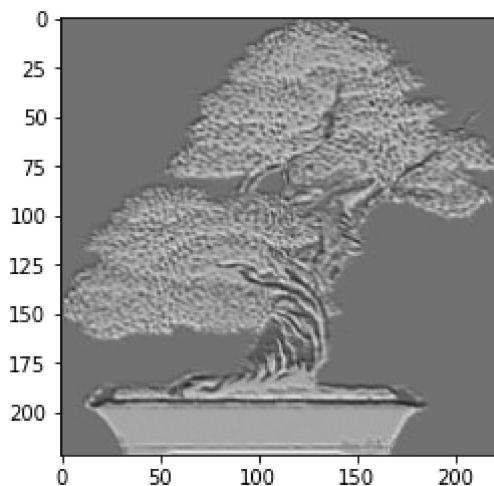
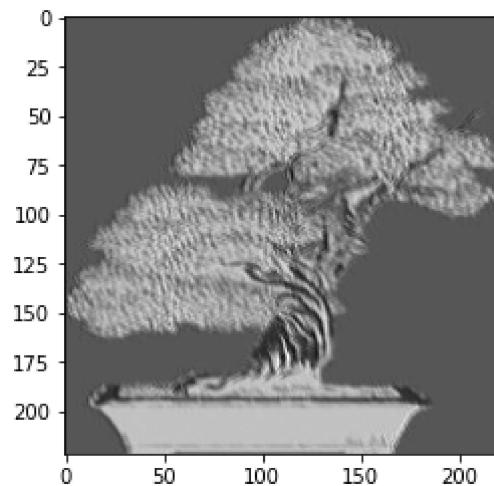
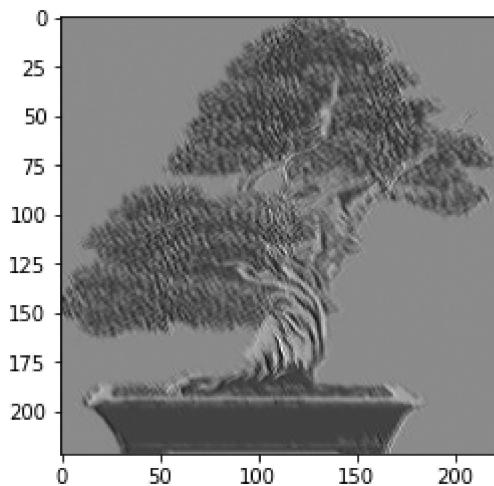


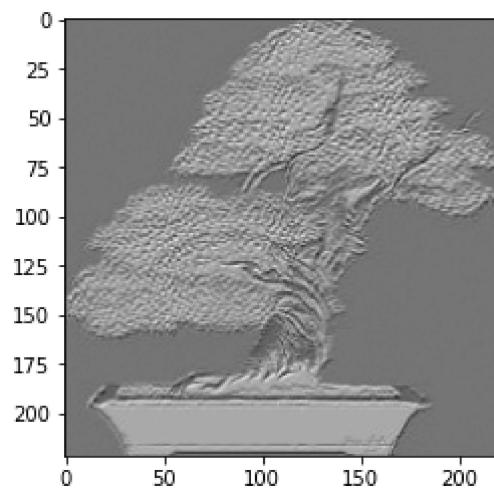
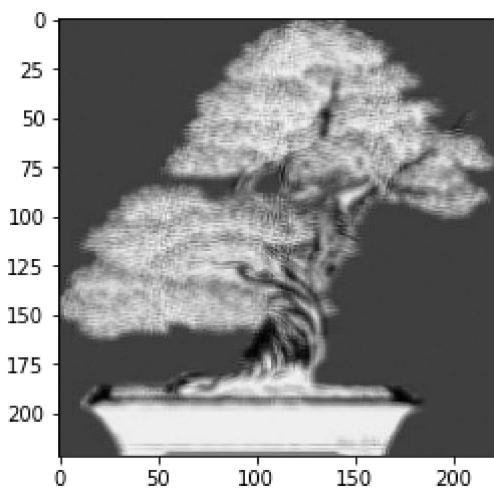
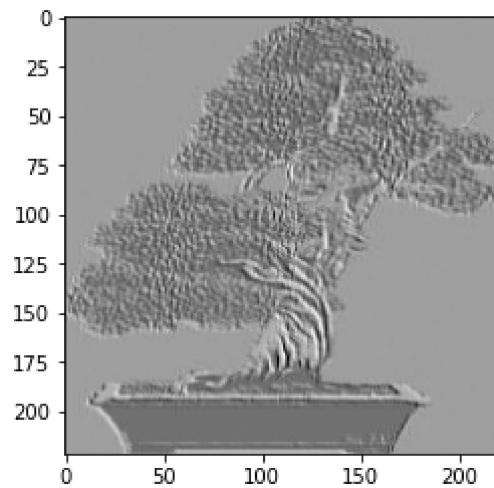
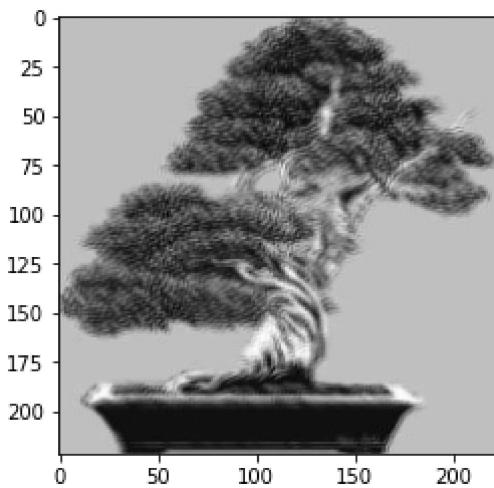
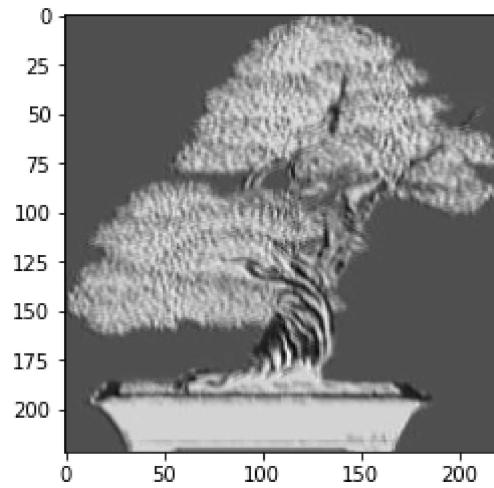
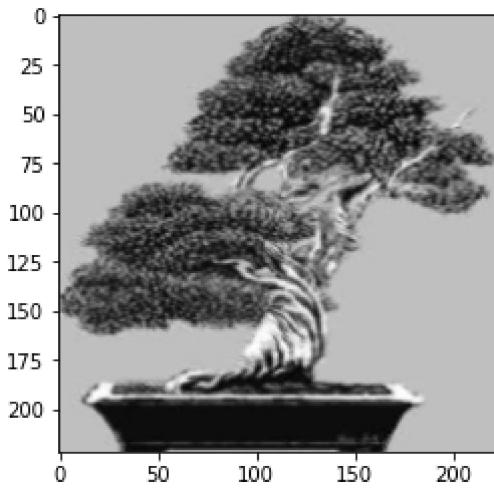


For Class “Bonsai”

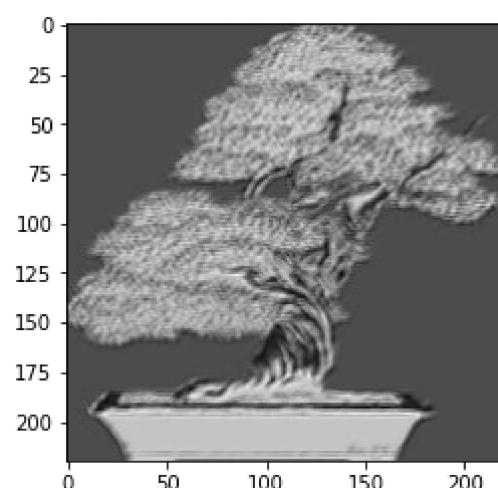
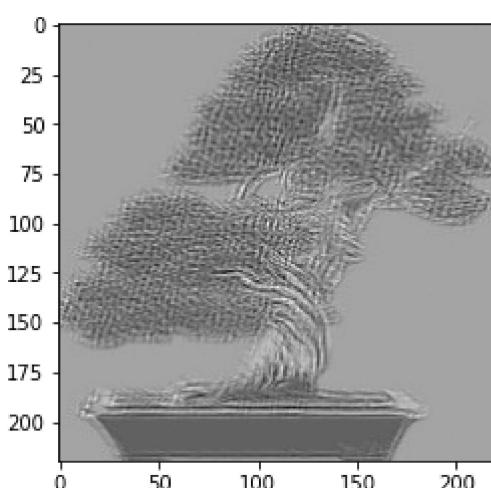
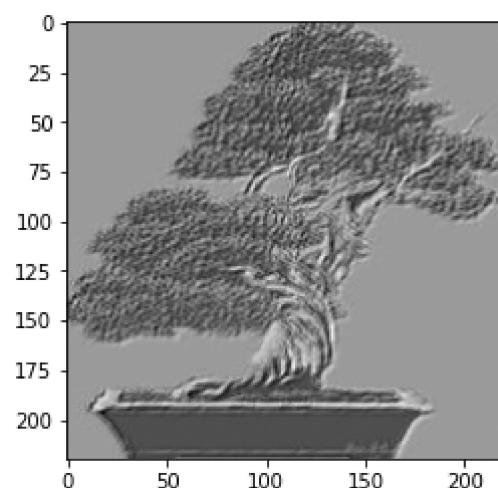
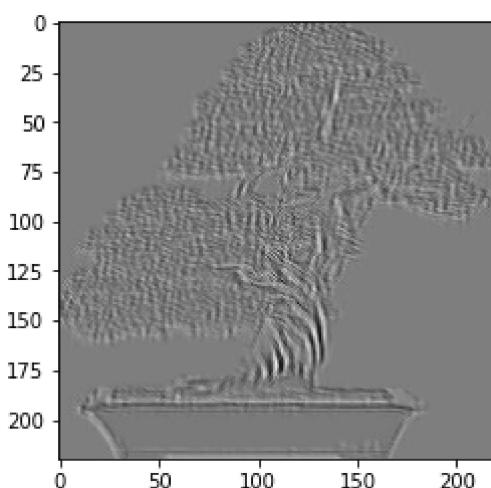
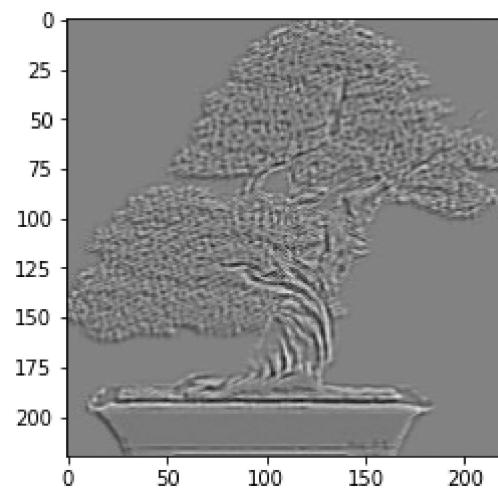
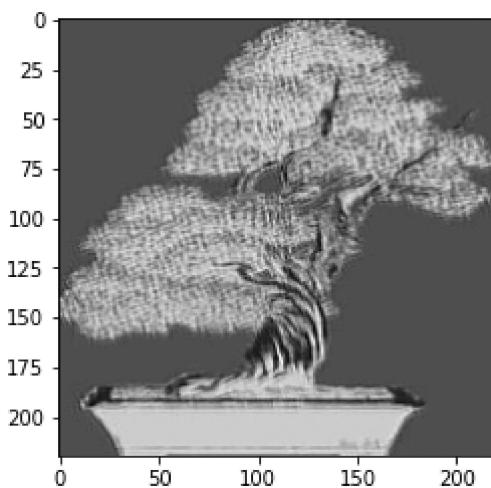


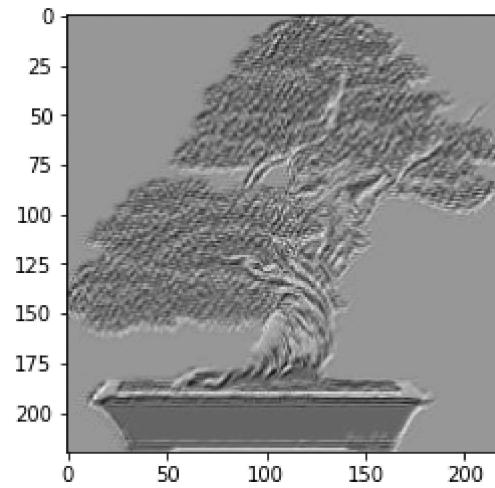
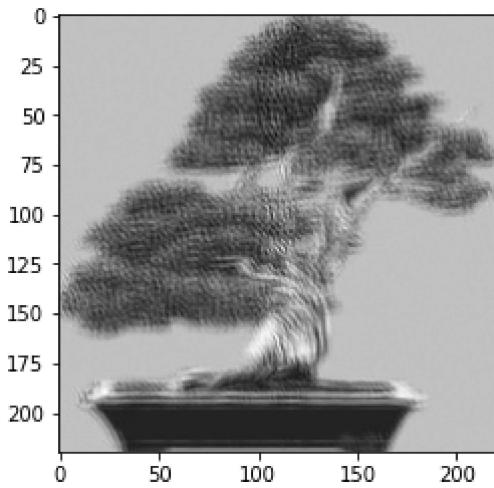
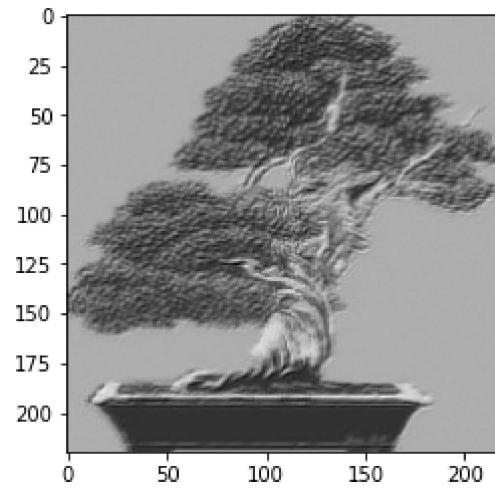
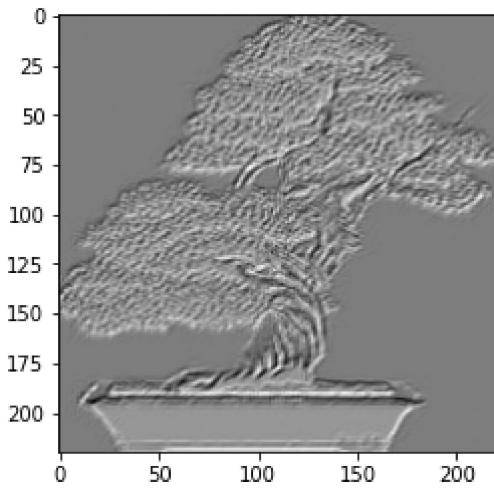
Feature Maps Plot For Layer 1:





Feature Maps Plot For Layer 2:





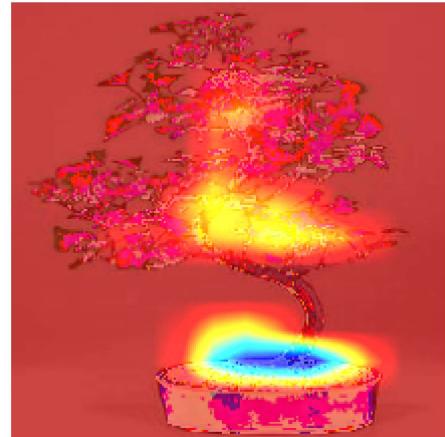
Q4

For the Bonsai input image:

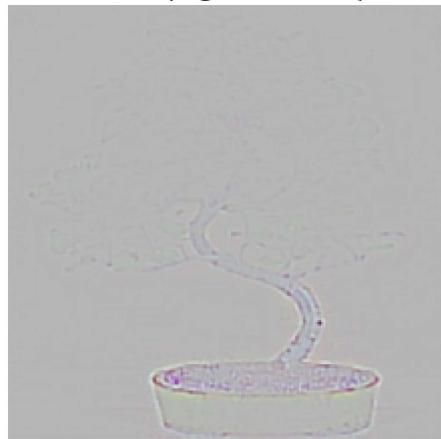
Loaded Image that is being feed to network



Grad Cam output Image



Guided Back Propagation Oi98 tput Image



Guided Cam output Image

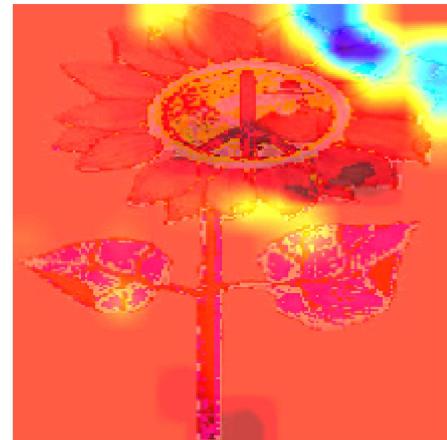


For the Sunflower as input image:

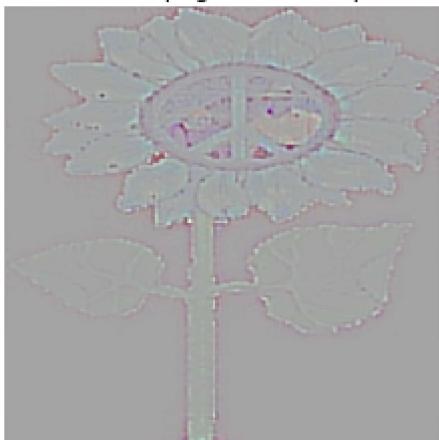
Loaded Image that is being feed to network



Grad Cam output Image



Guided Back Propagation Oi98 tput Image



Guided Cam output Image

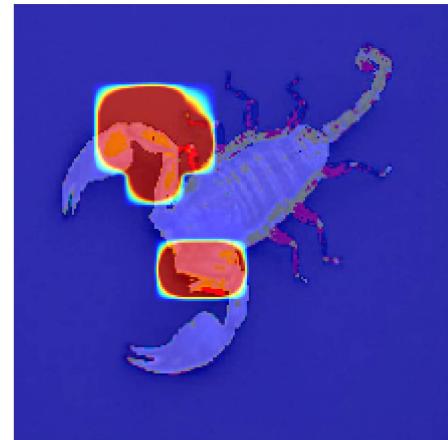


For the Scorpions input image:

Loaded Image that is being feed to network



Grad Cam output Image



Guided Back Propagation Oi98 tput Image



Guided Cam output Image

