CPSC 425 Assignment 1

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Question 1: boxfilter

```
>>> boxfilter(3)
array([[0.11111111, 0.11111111, 0.11111111],
       [0.11111111, 0.11111111, 0.11111111],
       [0.11111111, 0.11111111, 0.11111111]])
>>> boxfilter(4)
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "/home/julian/Notes/CPSC425/A1/assignment.py", line 13, in boxfilter
    assert ((n%2) != 0), "Dimension must be odd"
AssertionError: Dimension must be odd
>>> boxfilter(5)
array([[0.04, 0.04, 0.04, 0.04, 0.04],
       [0.04, 0.04, 0.04, 0.04, 0.04],
       [0.04, 0.04, 0.04, 0.04, 0.04],
       [0.04, 0.04, 0.04, 0.04, 0.04],
       [0.04, 0.04, 0.04, 0.04, 0.04]])
```

Question 2: gauss1d

```
>>> gauss1d(0.3)
array([0.00383626, 0.99232748, 0.00383626])
>>> gauss1d(0.5)
array([0.10650698, 0.78698604, 0.10650698])
>>> gauss1d(1)
array([0.00443305, 0.05400558, 0.24203623, 0.39905028, 0.24203623,
       0.05400558, 0.00443305])
>>> gauss1d(2)
array([0.0022182 , 0.00877313, 0.02702316, 0.06482519, 0.12110939,
       0.17621312, 0.19967563, 0.17621312, 0.12110939, 0.06482519,
       0.02702316, 0.00877313, 0.0022182 ])
```

Question 3: gauss2d

```
>>> gauss2d(0.5)
array([[0.01134374, 0.08381951, 0.01134374],
       [0.08381951, 0.61934703, 0.08381951],
       [0.01134374, 0.08381951, 0.01134374]])
>>> gauss2d(1)
array([[1.96519161e-05, 2.39409349e-04, 1.07295826e-03, 1.76900911e-03,
        1.07295826e-03, 2.39409349e-04, 1.96519161e-05],
       [2.39409349e-04, 2.91660295e-03, 1.30713076e-02, 2.15509428e-02,
        1.30713076e-02, 2.91660295e-03, 2.39409349e-04],
       [1.07295826e-03, 1.30713076e-02, 5.85815363e-02, 9.65846250e-02,
```

```
         5.85815363e-02, 1.30713076e-02, 1.07295826e-03],
        [1.76900911e-03, 2.15509428e-02, 9.65846250e-02, 1.59241126e-01,
         9.65846250e-02, 2.15509428e-02, 1.76900911e-03],
        [1.07295826e-03, 1.30713076e-02, 5.85815363e-02, 9.65846250e-02,
         5.85815363e-02, 1.30713076e-02, 1.07295826e-03],
        [2.39409349e-04, 2.91660295e-03, 1.30713076e-02, 2.15509428e-02,
         1.30713076e-02, 2.91660295e-03, 2.39409349e-04],
        [1.96519161e-05, 2.39409349e-04, 1.07295826e-03, 1.76900911e-03,
         1.07295826e-03, 2.39409349e-04, 1.96519161e-05]])
```

Question 4: gaussconveolve2d

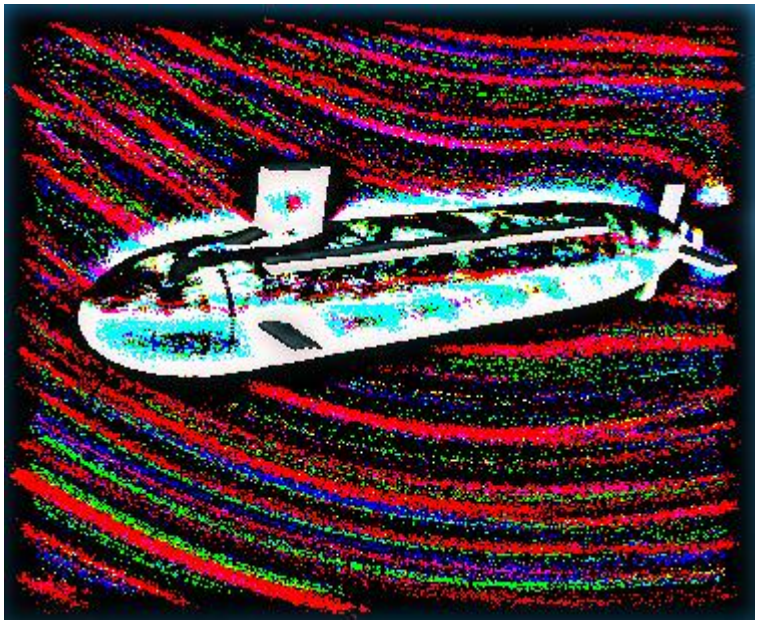
Part 2:

Question 1: lowPass

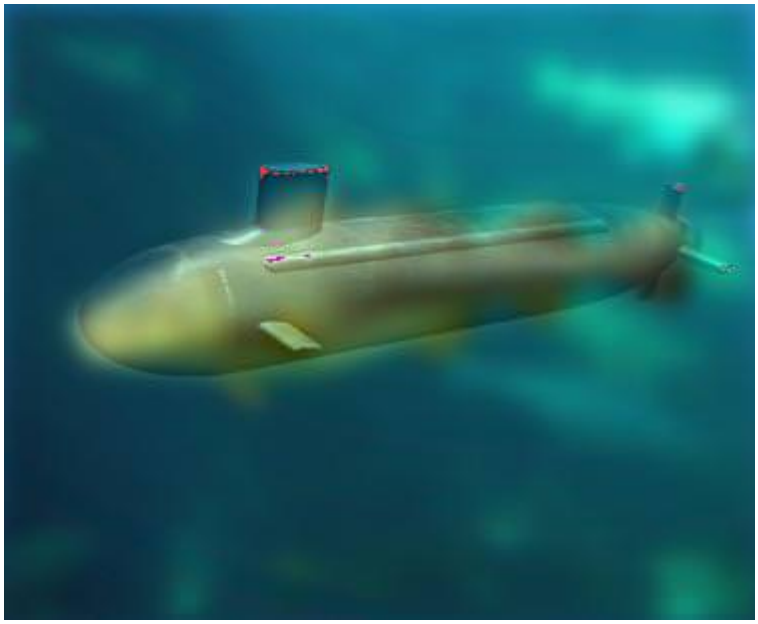
Using a sigma of 6.

Question 2: HighPass

Using a sigma of 6.

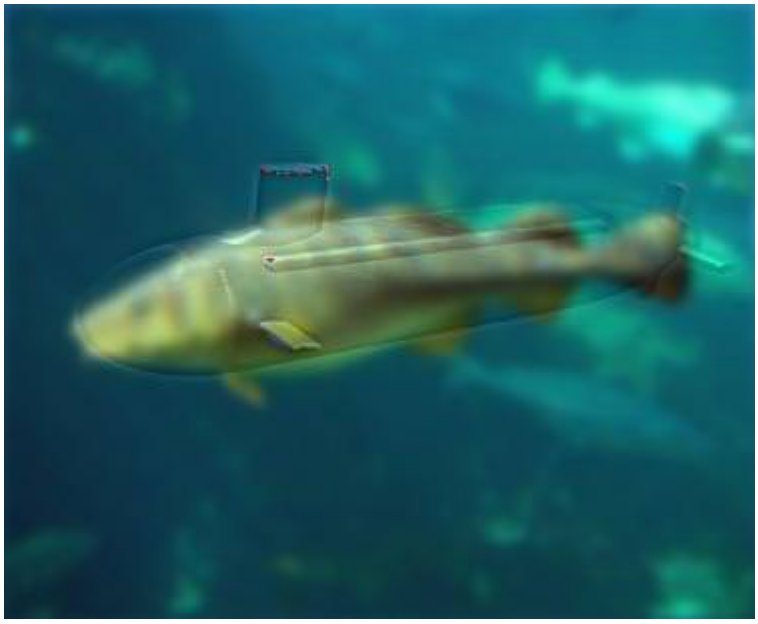


Question 3: Hybrid

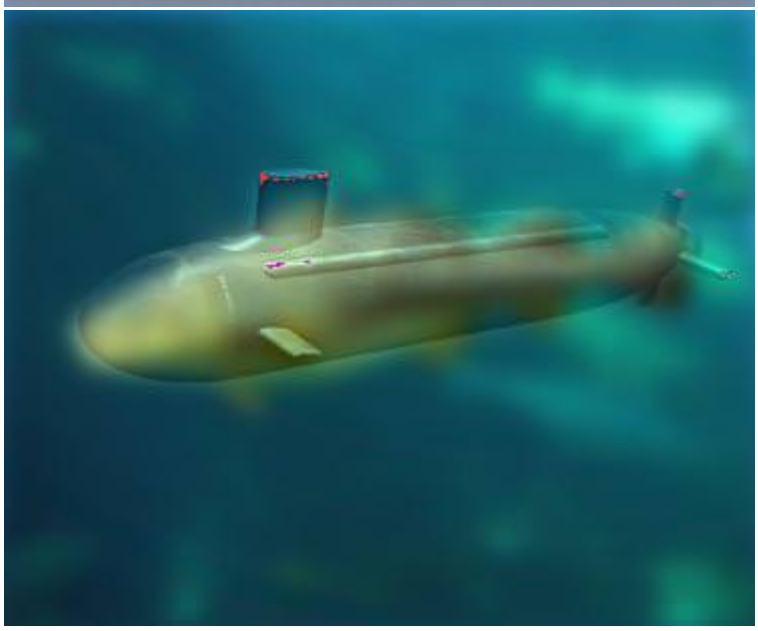


Other hybrids

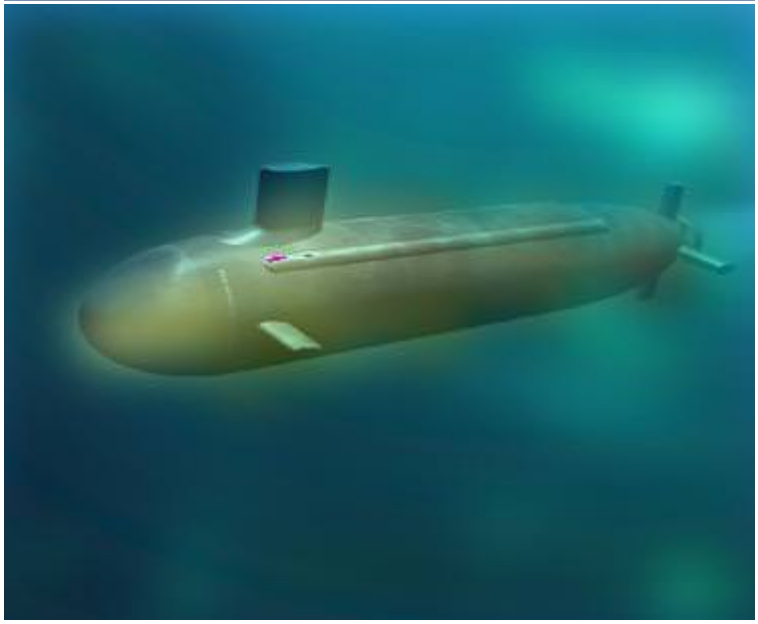
Using a sigma of 3:



Using sigma of 6:



Using a sigma of 13:



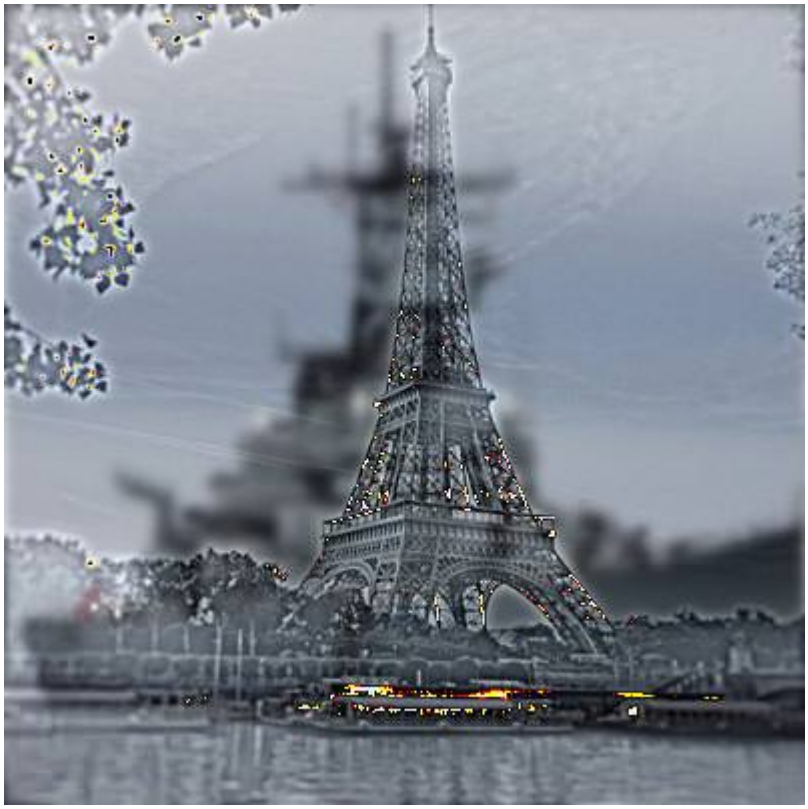
Just for fun

Battle Ship:

Eiffel Tower:

BattleShip as lowPass and Eiffel Tower as HighPass

Sigma of 3



Sigma of 6

Sigma of 13

Eiffel Tower as lowPass and BattleShip as HighPass

Sigma of 3

Sigma of 6

Sigma of 13