

HW19 - BIOE232

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My First Python Script!

```
# For outputting nice HTML file/PDF
# import pweave
import pprint as pp

# All the essentials
import numpy as np # np.__version__
import matplotlib.pyplot as plt
import math
from decimal import *
from pylab import *
```

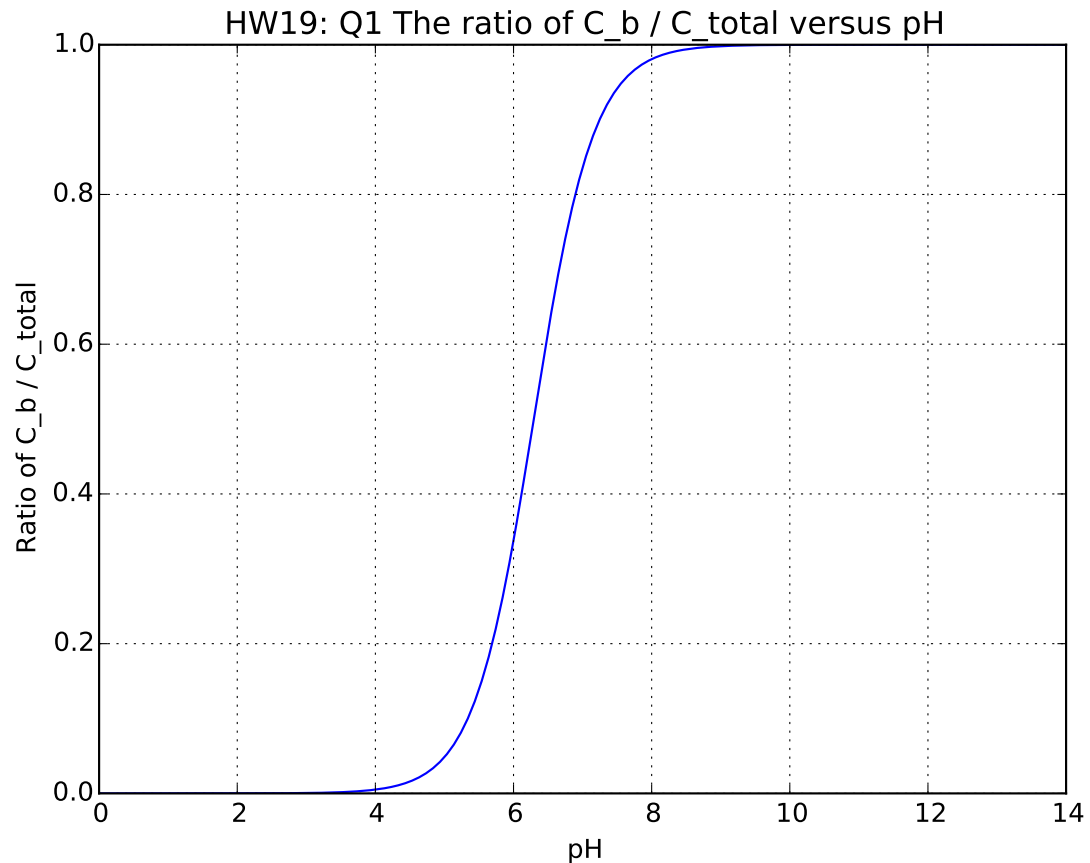
Question 1

```
# Declare variables
Ka = 5.1E-7
pKa = -math.log10(Ka)
pH = np.linspace(0, 14, num=140)
ratio = 1/(1 + pow(10, (pKa - pH)))

# Print out constants
pp.pprint(['Ka = ', Ka])
pp.pprint(['pKa = ', pKa])

# Plot function
plot(pH, ratio)
title('HW19: Q1 The ratio of C_b / C_total versus pH')
xlabel('pH')
ylabel('Ratio of C_b / C_total')
grid(True)
# show()
```

```
['Ka = ', 5.1e-07]
['pKa = ', 6.292429823902063]
```

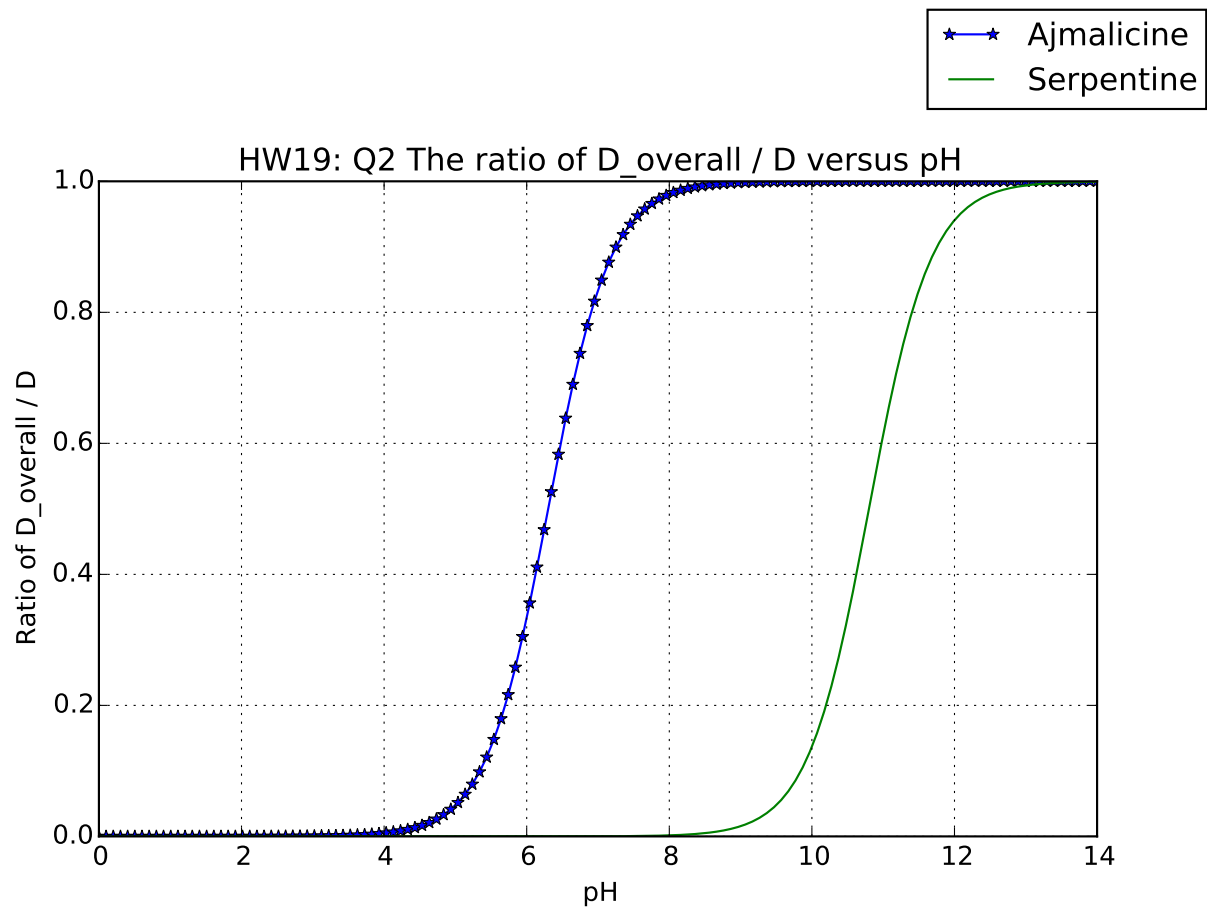


Question 2

```
# Declare variables
pKa1, pKa2 = 6.3, 10.8
pH = np.linspace(0, 14, num=140)
Dratio1 = 1/(1 + pow(10, (pKa1 - pH)))
Dratio2 = 1/(1 + pow(10, (pKa2 - pH)))

# Print out constants
# pp.pprint(['Dratio1 = ', Dratio1])
# pp.pprint(['Dratio2 = ', Dratio2])

# Plot function
fig = plt.figure()
ax1 = fig.add_axes([0.1, 0.1, 0.8, 0.7])
l1, l2 = ax1.plot(pH, Dratio1, '-*', pH, Dratio2)
fig.legend((l1, l2), ('Ajmalicine', 'Serpentine'), 'upper right')
title('HW19: Q2 The ratio of D_overall / D versus pH')
xlabel('pH')
ylabel('Ratio of D_overall / D')
grid(True)
# plt.show()
```



Question 3

```
pKa, pHv, pHc = 6.3, 3, 7
conc = (1+pow(10, pKa - pHv)) / (1+pow(10, pKa - pHc))
pp.pprint(['Concentration Ability = ', conc])
```

```
['Concentration Ability = ', 1664.2089706348017]
```