Python as a Programming Language

Blank notebook to be used for lab exercises.

Name: Brenda Parnin

abc123:svw192

Exercise 1: Putting it all together

Write a program that does the following:

- Prints the numbers 1 to 100
- For the numbers 10 to 25 (including 10 and 25), instead of printing the number, print the word "cheese".
- For numbers 55 to 100 (including 55, but not including 100), instead of printing the number, print the word "cake".
- For 100 print the word "Done!".

Important Python concepts: print(), if, elif, else, for

In [24]:
```
for b in range(1, 101):
    if b >= 10 and b <= 25:
        print("cheese")
    elif b >= 55 and b <100:
        print("cake")
    elif b == 100:
         print("Done!")
    else:
        print(b)
```

```
1
2
3
4
5
6
7
8
9
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
cheese
```

```
cheese
26
27
28
29
30
31
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41
42
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44
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46
47
48
49
50
51
52
53
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```

```
cake
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cake
Done!
```

In [ ]:

Exercise 2

Write a program which repeatedly reads numbers until the user enters “done”. Once “done” is entered, print out the total, count, and average of the numbers. If the user enters anything other than a number, detect their mistake using try and except and print an error message and skip to the next number.

What the code should look like when running:

```
Enter a number: 4
Enter a number: 5
Enter a number: bad data
Invalid input
Enter a number: 7
Enter a number: done
16 3 5.33333333333
```

Important Python concepts: print(), try, except, break, while

In [4]:

```
total = 0
count = 0
while True:
    try:
        number = input("Enter a number:")
        number = float(number)
        count += 1 # count = count + 1
        total += number # total = total + number
    except:
        if number != 'done':
            print('Invalid input')
        else:
            break

print("{} {} {}".format (total, count, total/count))
```

```
Invalid input

16.0 3 5.333333333333333
```

Exercise 3

Write a program that counts how many times each letter appears in a string. The counts for each character should be stored in a dictionary where the character is the key and the value is the count. Print the dictionary at the end.

Given the string **'aaabbc'**, the output should be a dictionary **{'a':3, 'b':2, 'c':1}**.

We are effectively computing a histogram, which is a statistical term for a set of counters (or frequencies).

Important Python concepts: dict ({}), for

In [9]:
```
word = 'brontosaurus'
```

In [14]:
```
# Write code to count the number of times each character appears in "brontosaurus" here

char_counts = {}
for character in word:
    if character is char_counts:
        char_counts[character] += 1
    else:
        char_counts[character] = 1
print(char_counts)
```

```
{'b': 1, 'r': 1, 'o': 1, 'n': 1, 't': 1, 's': 1, 'a': 1, 'u': 1}
```

In [22]:
```
char_counts = {}
for character in word:
    char_counts[character] = char_counts.get(character, 0) + 1
print(char_counts)
```

```
{'b': 1, 'r': 2, 'o': 2, 'n': 1, 't': 1, 's': 2, 'a': 1, 'u': 2}
```

In [23]:
```
# Print dictionary here

for key, value in char_counts.items():
    print(key, value)
```

```
b 1
r 2
o 2
n 1
t 1
s 2
a 1
u 2
```