In [1]:
```
#1 Einstein question
```

In [24]:
```
house = ["blue", "green", "red", "white", "yellow"]
nationality = ["Brit", "Dane","German","Norwegian","Swede"]
beverage = ["beer", "coffee", "milk","tea","water"]
cigar = ["Blue Master", "Dunhill","Pall Mall", "Prince","Blend"]
pet = ["cat", "bird","dog","fish","horse"]

solution = house + nationality + beverage + cigar + pet


dic1 = {'nationality':'Brit'}
dic2 = {'nationality':'Dane'}
dic3 = {'nationality':'German'}
dic4 = {'nationality':'Norwegian'}
dic5 = {'nationality':'Swede'}

#hints 1 to 15
dic1['house'] = 'red'
dic5['pet'] = 'dog'
```

In [58]:
```
#------------------------------------------------------------------------
```

In [ ]:
```

```

In [61]:
```
#2


def mergeSort(alist):
#test#    print("Splitting ",alist)

#lenth==1 -> basecase
    if len(alist)>1:
        mid = len(alist)//2
#devide into two part and get sorted half
        lefthalf = alist[:mid]
        righthalf = alist[mid:]

        mergeSort(lefthalf)
        mergeSort(righthalf)


#merge
        i=0
        j=0
        k=0
        while i < len(lefthalf) and j < len(righthalf):
            if lefthalf[i] < righthalf[j]:
                alist[k]=lefthalf[i]
                i=i+1
            else:
                alist[k]=righthalf[j]
                j=j+1
            k=k+1

#when just right are left
        while i < len(lefthalf):
            alist[k]=lefthalf[i]
            i=i+1
            k=k+1
#when just left are left
        while j < len(righthalf):
            alist[k]=righthalf[j]
            j=j+1
            k=k+1
    print("Merging ",alist)
```

In [62]:
```
#Generate a list between one to ten thosand
i = 1
a = [i]
while i < 10000 :
    i = i+1
    a.append(i)



#Randomize their order

import random
random.shuffle(a)



mergeSort(a)
```

```
 9790, 9791, 9792, 9793, 9794, 9795, 9796, 9797, 9798, 9799, 9800, 98
01, 9802, 9803, 9804, 9805, 9806, 9807, 9808, 9809, 9810, 9811, 9812,
 9813, 9814, 9815, 9816, 9817, 9818, 9819, 9820, 9821, 9822, 9823, 98
24, 9825, 9826, 9827, 9828, 9829, 9830, 9831, 9832, 9833, 9834, 9835,
 9836, 9837, 9838, 9839, 9840, 9841, 9842, 9843, 9844, 9845, 9846, 98
47, 9848, 9849, 9850, 9851, 9852, 9853, 9854, 9855, 9856, 9857, 9858,
 9859, 9860, 9861, 9862, 9863, 9864, 9865, 9866, 9867, 9868, 9869, 98
70, 9871, 9872, 9873, 9874, 9875, 9876, 9877, 9878, 9879, 9880, 9881,
 9882, 9883, 9884, 9885, 9886, 9887, 9888, 9889, 9890, 9891, 9892, 98
93, 9894, 9895, 9896, 9897, 9898, 9899, 9900, 9901, 9902, 9903, 9904,
 9905, 9906, 9907, 9908, 9909, 9910, 9911, 9912, 9913, 9914, 9915, 99
16, 9917, 9918, 9919, 9920, 9921, 9922, 9923, 9924, 9925, 9926, 9927,
 9928, 9929, 9930, 9931, 9932, 9933, 9934, 9935, 9936, 9937, 9938, 99
39, 9940, 9941, 9942, 9943, 9944, 9945, 9946, 9947, 9948, 9949, 9950,
 9951, 9952, 9953, 9954, 9955, 9956, 9957, 9958, 9959, 9960, 9961, 99
62, 9963, 9964, 9965, 9966, 9967, 9968, 9969, 9970, 9971, 9972, 9973,
 9974, 9975, 9976, 9977, 9978, 9979, 9980, 9981, 9982, 9983, 9984, 99
85, 9986, 9987, 9988, 9989, 9990, 9991, 9992, 9993, 9994, 9995, 9996,
 9997, 9998, 9999, 10000]
```

In [ ]:

In [ ]:

In [63]:
```
#-----------------------------------------------------------------------
```

In [86]:
```
#3
import string
fhand = open('mailbox.txt')
counts = 0
for line in fhand :
    #print(line)

    inp = fhand.readline()
    tem = inp.find('From')
    #print(tem)

    if tem == 0 :
        #print(inp)
        counts = counts+1
        words = inp.split()
        for word in words :
            if word.find('@')!= -1 :
                print(word)
                key = word.find('@') + 1
                answer = word[key:]
                print(answer)
                print("\n")

print("the total number of ines starting with From : ", counts)
```

```
stephen.marquard@uct.ac.za
uct.ac.za


louis@media.berkeley.edu
media.berkeley.edu


zqian@umich.edu
umich.edu


rjlowe@iupui.edu
iupui.edu


zqian@umich.edu
umich.edu


the total number of ines starting with From :  5
```

In [87]:
```
#---------------------------------------------------------------
```

In [13]:
```
#4
#1. Open file
import string
fhand = open('ROMEO.txt')

#2. Create an empty 'new words' list
counts = []
#3. Create a loop of strings for each line
for line in fhand:
    line = line.lower()
    words = line.split()

    for word in words:
        if word not in counts:
            counts.append(word)


#7. When the loop is finished sort the new words list so that it is alph

#print(counts)
counts.sort()
print(counts)

print("the number of list elements : ", len(counts))

    #print(tem)

#2. Create an empty 'new words' list
#3. Create a loop of strings for each line
#4. For every new string create a list consisting of new words
#5. Check if every element in the list is in the 'new words' list.
#6. If it is not repeated append the new word to the list.
#7. When the loop is finished sort the new words list so that it is alph
#8. Print the list elements and the number of elements.
```

```
['already', 'and', 'arise', 'breaks', 'but', 'east', 'envious', 'fair',
'grief', 'is', 'it', 'juliet', 'kill', 'light', 'moon', 'pale', 'sick',
'soft', 'sun', 'the', 'through', 'what', 'who', 'window', 'with', 'yond
er']
the number of list elements :  26
```

In [14]:
```
#---------------------------------------------------------------------
```

In [15]:
```
#5

fname = input('Enter the file name: ')
try :
    fhand = open(fname)
except :
    print('File cannot be opened:', fname)
    exit()

counts = dict()

for line in fhand:
    words = line.split()
    # print(words)
    for word in words :
        counts[word] = counts.get(word,0) + 1
print(counts)
```

```
Enter the file name: ROMEO.txt
{'But': 1, 'soft': 1, 'what': 1, 'light': 1, 'through': 1, 'yonder': 1,
'window': 1, 'breaks': 1, 'It': 1, 'is': 3, 'the': 3, 'east': 1, 'and':
3, 'Juliet': 1, 'sun': 2, 'Arise': 1, 'fair': 1, 'kill': 1, 'envious':
1, 'moon': 1, 'Who': 1, 'already': 1, 'sick': 1, 'pale': 1, 'with': 1,
'grief': 1}
```

In [ ]: