import random, time

def mergeSort(alist):

if len(alist)>1:

mid = len(alist)//2

lefthalf = alist[:mid]

righthalf = alist[mid:]

mergeSort(lefthalf)

mergeSort(righthalf)

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

while i < len(lefthalf):

alist[k]=lefthalf[i]

i=i+1

k=k+1

while j < len(righthalf):

alist[k]=righthalf[j]

j=j+1

k=k+1

def bubbleSort(alist):

for passnum in range(len(alist)-1,0,-1):

for i in range(passnum):

if alist[i]>alist[i+1]:

temp = alist[i]

alist[i] = alist[i+1]

alist[i+1] = temp

alist = []

numofnums = 0

while (numofnums != -1):

log = open('SortLog.txt', 'a+')

numofnums = int(input('How many numbers in the list (enter -1 to end): '))

for i in range(0, numofnums):

alist.append(random.randint(1,10000))

blist = alist

starttime1 = time.time()

bubbleSort(alist)

bubbletime = time.time() - starttime1

starttime2 = time.time()

mergeSort(blist)

mergetime = time.time() - starttime2

writethis = str(numofnums) + ' Bubbletime: ' + str(bubbletime) + ' Mergetime: ' + str(mergetime) + '\n'

if (numofnums != -1):

log.write(writethis)

log.close()

exit()

10 Bubbletime: 0.0 Mergetime: 0.0010001659393310547

100 Bubbletime: 0.0010006427764892578 Mergetime: 0.0

1000 Bubbletime: 0.12609028816223145 Mergetime: 0.004002571105957031

5000 Bubbletime: 4.480252504348755 Mergetime: 0.02701854705810547

9876 Bubbletime: 26.546775579452515 Mergetime: 0.07906103134155273

35000 Bubbletime: 281.8498480319977 Mergetime: 0.327223539352417

10 Bubbletime: 0.0 Mergetime: 0.0

100 Bubbletime: 0.0020029544830322266 Mergetime: 0.0010085105895996094

1000 Bubbletime: 0.1471083164215088 Mergetime: 0.004004001617431641

3000 Bubbletime: 1.754300594329834 Mergetime: 0.0170135498046875

5000 Bubbletime: 8.176910638809204 Mergetime: 0.04102897644042969

9876 Bubbletime: 35.52402973175049 Mergetime: 0.10107231140136719

30000 Bubbletime: 98.69518756866455 Mergetime: 0.19113421440124512

50000 Bubbletime: 287.789324760437 Mergetime: 0.2812533378601074

70000 Bubbletime: 564.6877353191376 Mergetime: 0.40624141693115234