OCS 25 - Data Structures and Algorithms
Programming Assignment – 7
String Sorting

String sorts

1) Give a trace for LSD string sort for the keys

no is th ti fo al go pe to co to th ai of th pa

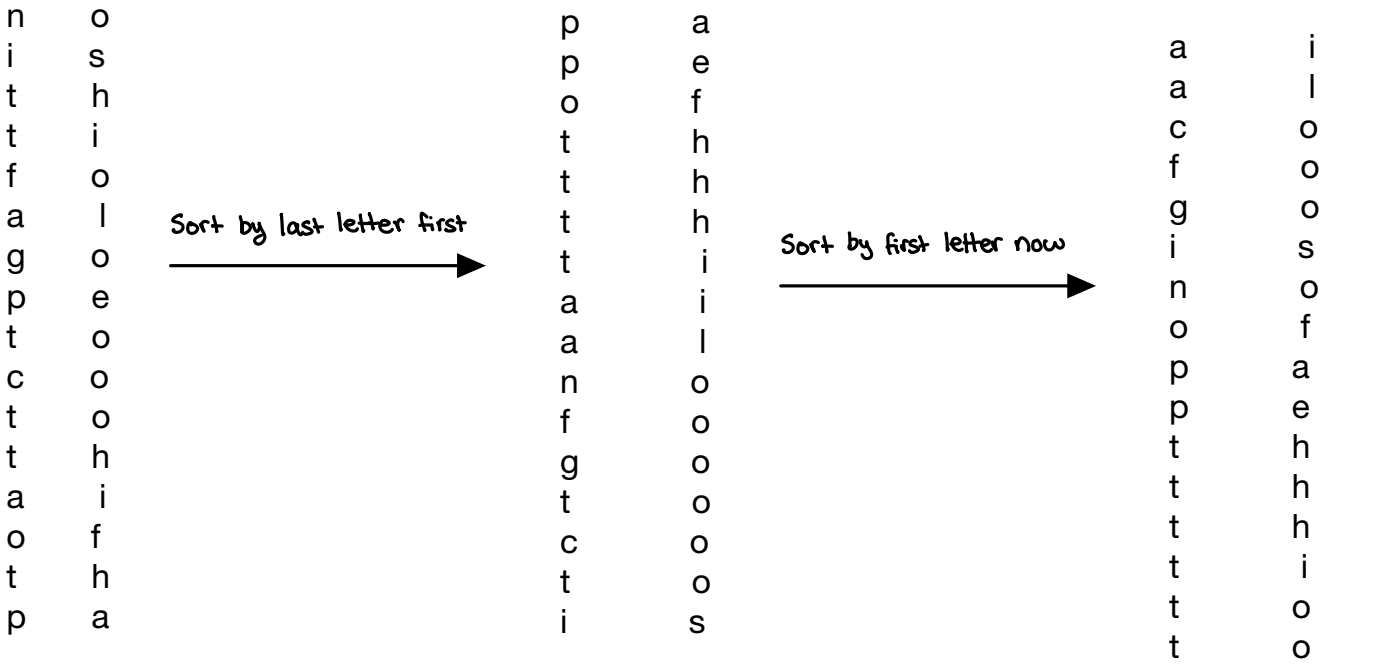
2) Give a trace for MSD string sort for the keys

no is th ti fo al go pe to co to th ai of th pa

3) Give a trace for MSD string sort for the keys

now is the time for all good people to come to the aid of

1) LSD



2) MSD

---

n	o
i	s
t	h
t	i
f	o
a	l
g	o
p	e
t	o
c	o
t	o
t	h
a	i
o	f
t	h
p	a

Sort the first letter first →

a	l
a	i
c	o
f	o
g	o
i	s
n	o
o	f
p	e
p	a
t	h
t	i
t	o
t	o
t	h
t	h

Sort by the last letter now →

a	i
a	l
c	o
f	o
g	o
i	s
n	o
o	f
p	a
p	e
t	h
t	h
t	h
t	i
t	o
t	o

If two words have the same first letter, use recursion to keep them in the same "box" to prevent overriding.

Only sort by last letter within boxes.

3) MSD

	Sort 1st letter →		Sort 2nd →		Sort 3rd →	
now…		all….		aid…		aid…
is….		aid….		---		---
the….		---		all…		all…
time..		come..		---		---
for….		---		come..		come…
all…		for….		---		---
good..		---		for….		for…
people		good..		---		---
to….		---		good..		good…
come..		is….		---		---
to….		---		is….		is…
the….		now…		---		---
aid…		---		now…		now…
of….		of….		---		---
		---		of….		of….
		people		---		---
		---		people		people
		the…		---		---
		time..		the…		the…
		to….		the…		the…
		to….		---		---
		the….		time..		time
				---		---
				to….		to….
				to….		to….

If index ≥ word.length, word.charAt(index) = -1. Here this is illustrated by periods which will be given the lowest lexicographical value, which is not actually true in ASCII, but put here for visual illustration.

MSD will also sort by the 4th, 5th, and 6th letters, but nothing more will change here.