CS 531: Fundamentals of Systems Programming
Fall 2015
Instructor: Hal Greenwald
Homework # 1

Design and implement a C language program based on the following specifications:

1. **The user interface will prompt for ten unique *character strings* to be entered from the keyboard. The program sorts this series of ten character strings (based on ascii value), and reprints all ten strings in ascending OR descending order based on user specification. The program then prints and labels the character string with the lowest ascii value and that with the highest ascii value.**
2. **Include as much error checking as possible.**
3. **Include at least 2 *user defined* functions.**
4. **Program must be well commented.**
5. **Up to 10% extra credit will be given for successful utilization of *dynamic memory allocation*.**
6. **Students will work in groups (3 students per group), and each group will submit source code and Makefile**

Example:

Hals-iMac:~ halgreenwald$ ./hw1 Enter 10 character strings: Enter string 1: Test string 1 Enter string 2: Test string 1 Enter string 3: hello world Enter string 4: CS 531 Enter string 5: George Mason University Enter string 6: abcedfg hijk Enter string 7: George Mason University ***Error: duplicate string – please re-enter*** Enter string 7: k j i Enter string 8: Test string 2 Enter string 9: test string 1 Enter string 10: test String 1	*…cont* Print character strings in **A**scending or **D**escending order: **A** *Ascending order:* CS 531 George Mason University Test string 1 Test string 1 Test string 2 abcedfg hijk hello world k j i test String 1 test string 1 String with lowest ascii value: CS 531 String with highest ascii value: test string 1

c	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
)	0	000	NUL (null)	32	20	040		Space	64	40	100	@	@	96	60	140	`	`
L	1	001	SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	ETX (end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4	004	EOT (end of transmission)	36	24	044	$	$	68	44	104	D	D	100	64	144	d	d
5	5	005	ENQ (enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6	006	ACK (acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7	007	BEL (bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8	010	BS (backspace)	40	28	050	(	(	72	48	110	H	H	104	68	150	h	h
9	9	011	TAB (horizontal tab)	41	29	051	)	)	73	49	111	I	I	105	69	151	i	i
)	A	012	LF (NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
L	B	013	VT (vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
2	C	014	FF (NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
3	D	015	CR (carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
4	E	016	SO (shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
5	F	017	SI (shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
5	10	020	DLE (data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
7	11	021	DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
8	12	022	DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
9	13	023	DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
)	14	024	DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
L	15	025	NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
2	16	026	SYN (synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
3	17	027	ETB (end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
4	18	030	CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
5	19	031	EM (end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
5	1A	032	SUB (substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
7	1B	033	ESC (escape)	59	3B	073	;	;	91	5B	133	[	[	123	7B	173	{	{
8	1C	034	FS (file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174			|
9	1D	035	GS (group separator)	61	3D	075	=	=	93	5D	135	]	]	125	7D	175	}	}
)	1E	036	RS (record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
L	1F	037	US (unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177	&#127;	D

Source: www.LookupTables.c