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Week 7

Intro to Python

Objectives

- Strings
- Indexing
- Substrings
- For loops & Strings

Strings

Recall that strings are basically just text and the syntax is “text” or ‘text.’

```
x = "String"
y = "Longer string"
z = "This is also a string"
```

Functions for strings

```
>>> s = "Welcome"
>>> len(s)
7
>>> max(s)
'o'
>>> min(s)
'W'
```

Dec	Hex	Oct	Chr	Dec	Hex	Oct	HTML	Chr	Dec	Hex	Oct	HTML	Chr	Dec	Hex	Oct	HTML	Chr
0	0	000	NULL	32	20	040	&#032;	Space	64	40	100	&#064;	@	96	60	140	&#096;	`
1	1	001	Start of Header	33	21	041	&#033;	!	65	41	101	&#065;	A	97	61	141	&#097;	a
2	2	002	Start of Text	34	22	042	&#034;	"	66	42	102	&#066;	B	98	62	142	&#098;	b
3	3	003	End of Text	35	23	043	&#035;	#	67	43	103	&#067;	C	99	63	143	&#099;	c
4	4	004	End of Transmission	36	24	044	&#036;	$	68	44	104	&#068;	D	100	64	144	&#100;	d
5	5	005	Enquiry	37	25	045	&#037;	%	69	45	105	&#069;	E	101	65	145	&#101;	e
6	6	006	Acknowledgment	38	26	046	&#038;	&	70	46	106	&#070;	F	102	66	146	&#102;	f
7	7	007	Bell	39	27	047	&#039;	'	71	47	107	&#071;	G	103	67	147	&#103;	g
8	8	010	Backspace	40	28	050	&#040;	(	72	48	110	&#072;	H	104	68	150	&#104;	h
9	9	011	Horizontal Tab	41	29	051	&#041;	)	73	49	111	&#073;	I	105	69	151	&#105;	i
10	A	012	Line feed	42	2A	052	&#042;	*	74	4A	112	&#074;	J	106	6A	152	&#106;	j
11	B	013	Vertical Tab	43	2B	053	&#043;	+	75	4B	113	&#075;	K	107	6B	153	&#107;	k
12	C	014	Form feed	44	2C	054	&#044;	,	76	4C	114	&#076;	L	108	6C	154	&#108;	l
13	D	015	Carriage return	45	2D	055	&#045;	-	77	4D	115	&#077;	M	109	6D	155	&#109;	m
14	E	016	Shift Out	46	2E	056	&#046;	.	78	4E	116	&#078;	N	110	6E	156	&#110;	n
15	F	017	Shift In	47	2F	057	&#047;	/	79	4F	117	&#079;	O	111	6F	157	&#111;	o
16	10	020	Data Link Escape	48	30	060	&#048;	0	80	50	120	&#080;	P	112	70	160	&#112;	p
17	11	021	Device Control 1	49	31	061	&#049;	1	81	51	121	&#081;	Q	113	71	161	&#113;	q
18	12	022	Device Control 2	50	32	062	&#050;	2	82	52	122	&#082;	R	114	72	162	&#114;	r
19	13	023	Device Control 3	51	33	063	&#051;	3	83	53	123	&#083;	S	115	73	163	&#115;	s
20	14	024	Device Control 4	52	34	064	&#052;	4	84	54	124	&#084;	T	116	74	164	&#116;	t
21	15	025	Negative Ack.	53	35	065	&#053;	5	85	55	125	&#085;	U	117	75	165	&#117;	u
22	16	026	Synchronous idle	54	36	066	&#054;	6	86	56	126	&#086;	V	118	76	166	&#118;	v
23	17	027	End of Trans. Block	55	37	067	&#055;	7	87	57	127	&#087;	W	119	77	167	&#119;	w
24	18	030	Cancel	56	38	070	&#056;	8	88	58	130	&#088;	X	120	78	170	&#120;	x
25	19	031	End of Medium	57	39	071	&#057;	9	89	59	131	&#089;	Y	121	79	171	&#121;	y
26	1A	032	Substitute	58	3A	072	&#058;	:	90	5A	132	&#090;	Z	122	7A	172	&#122;	z
27	1B	033	Escape	59	3B	073	&#059;	;	91	5B	133	&#091;	[	123	7B	173	&#123;	{
28	1C	034	File Separator	60	3C	074	&#060;	<	92	5C	134	&#092;	\	124	7C	174	&#124;	|
29	1D	035	Group Separator	61	3D	075	&#061;	=	93	5D	135	&#093;	]	125	7D	175	&#125;	}
30	1E	036	Record Separator	62	3E	076	&#062;	>	94	5E	136	&#094;	^	126	7E	176	&#126;	~
31	1F	037	Unit Separator	63	3F	077	&#063;	?	95	5F	137	&#095;	_	127	7F	177	&#127;	Del

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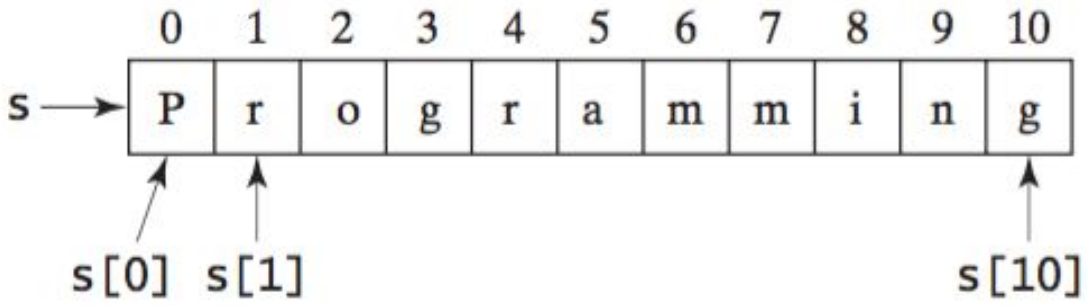
Indexing

A string is a series of characters.

If we define a string, *s = Programming*, we can write it as a sequence of characters where each character can be accessed using '[ ]' - like *s[index]*:



Notice that the indices range from zero to *len(s)-1*

Indexing cont.

Negative numbers can also be used as indices:

0	1	2	3	4	5	6	7	8	9	10
P	r	o	g	r	a	m	m	i	n	g
-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1

s[-1] is the same

as s[-1 + len(s)] = s[10]

```
>>> s = "Welcome"
>>> s[-1]
'e'
>>> s[-2]
'm'
```

Slicing Operator (substrings)

Syntax: *s[start:end]*

Creates a substring of the original string from index *start* to index *end-1*.

W	e	l	c	o	m	e
0	1	2	3	4	5	6

```
>>> s = "Welcome"
>>> s[ : 6]
'Welcom'
>>> s[4 : ]
'ome'
>>> s[1 : -1]
'elcom'
```

The *in* and *not in* operators

Test whether a string is in another string.

```
s = "Welcome"

print('Wel' in s)
>>> True
print("oe" in s)
>>> False
print("come" not in s)
>>> False
print('wel' in s)
>>> False
```

Comparing Strings

Python compares strings by comparing their corresponding characters, and it does this by evaluating the characters' numeric codes.

Comparisons are made starting with the first characters. If the characters are equal, the second two are compared, and so on.

```
>>> "green" == "glow"
False
>>> "green" != "glow"
True
>>> "green" > "glow"
True
>>> "green" >= "glow"
True
>>> "green" < "glow"
False
>>> "green" <= "glow"
False
>>> "ab" <= "abc"
True
```

Iterating through strings

```
s = "Welcome"

for ch in s:
    print(ch)
>>> "W"
>>> "e"
>>> "l"
    .
    .
    .
```

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