< Exam Reference Sheet > - DSA8640

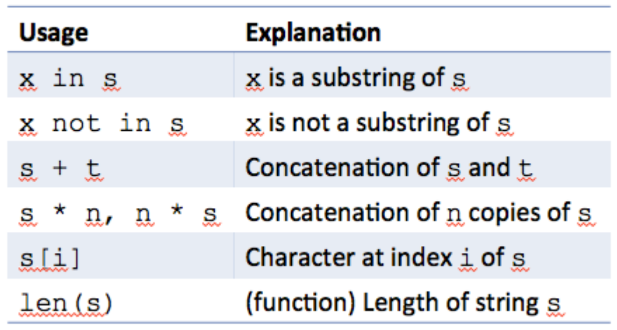
Algebraic expressions

Usage	Explanation
a + b	sum of a and b
a - b	difference of a and b
a * b	product of a and b
a / b	quotient of a and b
a ** b	a to the b power
a // b	quotient from floor division of a and b
a % b	remainder of a / b

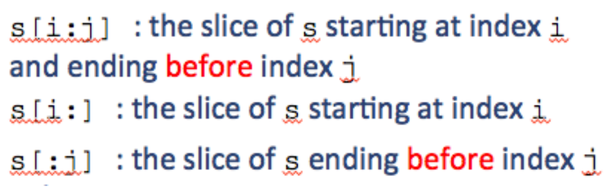
Boolean expressions

Usage	Explanation
a < b	a is smaller than b
a <= b	a is smaller than or equal to b
a > b	a is bigger than b
a >= b	a is bigger than or equal to b
a == b	a is equal to b
a != b	a is not equal to b

String operators, functions, and methods



Usage	Explanation
`x in s`	x is a substring of s
`x not in s`	x is not a substring of s
`s + t`	Concatenation of s and t
`s * n, n * s`	Concatenation of n copies of s
`s[i]`	Character at index i of s
`len(s)`	(function) Length of string s



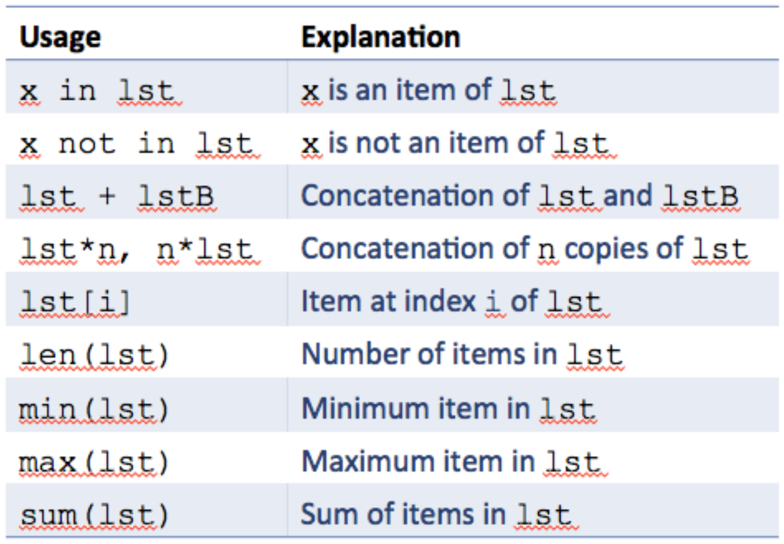
`s[i:j]` : the slice of s starting at index i and ending before index j

`s[i:]` : the slice of s starting at index i

`s[:j]` : the slice of s ending before index j

Usage	Explanation
`s.capitalize()`	returns a copy of `s` with first character capitalized
`s.count(target)`	returns the number of occurrences of `target` in `s`
`s.find(target)`	returns the index of the first occurrence of `target` in `s`
`s.lower()`	returns lowercase copy of `s`
`s.upper()`	returns uppercase copy of `s`
`s.split(sep)`	returns list of substrings of `s`, delimited by `sep`

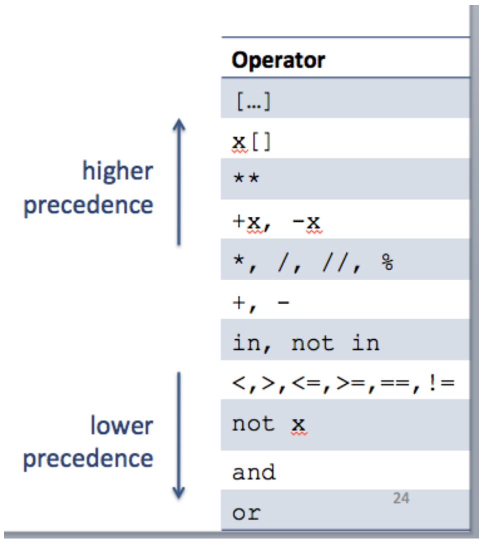
List operators, functions, and methods



Usage	Explanation
`x in lst`	`x` is an item of `lst`
`x not in lst`	`x` is not an item of `lst`
`lst + lstB`	Concatenation of `lst` and `lstB`
`lst*n, n*lst`	Concatenation of `n` copies of `lst`
`lst[i]`	Item at index `i` of `lst`
`len(lst)`	Number of items in `lst`
`min(lst)`	Minimum item in `lst`
`max(lst)`	Maximum item in `lst`
`sum(lst)`	Sum of items in `lst`

Usage	Explanation
`lst.append(item)`	adds `item` to the end of `lst`
`lst.count(item)`	returns the number of times `item` occurs in `lst`
`lst.index(item)`	Returns index of (first occurrence of) `item` in `lst`
`lst.pop()`	Removes and returns the last item in `lst`
`lst.remove(item)`	Removes (the first occurrence of) `item` from `lst`
`lst.reverse()`	Reverses the order of items in `lst`
`lst.sort()`	Sorts the items of `lst` in increasing order

Operator precedence


higher precedence
lower precedence
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Operator
`[…]`
`x[]`
`**`
`+x, -x`
`*, /, //, %`
`+, -`
`in, not in`
`<,>,<=,>=,==,!=`
`not x`
`and`
`or`

Import a module

```
import <module>
```

One-way if statement syntax

```
if <condition>:
    <indented code block>
<non-indented statement>
```

Two-way if statement syntax

```
if <condition>:
    <indented code block 1>
else:
    <indented code block 2>
<non-indented statement>
```

Multi-way if statement syntax

```
If <condition>:
    <indented code block 1>
elif <condition2>:
    <indented code block 2>
else:
    <indented code block 3>
<non-indented statement>
```

for loop syntax

```
for <variable> in <sequence>:
    <indented code block >
<non-indented code block>
```

while loop syntax

```
while <condition>:
    <indented code block>
<non-indented statement>
```

function definition syntax

```
def <function name> (<0 or more variables>):
    <indented function body>
```

range() function

- To iterate over the n numbers 0, 1, 2, …, n-1

```
  for i in range(n):
```

- To iterate over the range j, j+1, j+2, …, n-1

```
  for i in range(j, n):
```

- To iterate over the range with step c: j, j+c, j+2c, j+3c, …, n-1

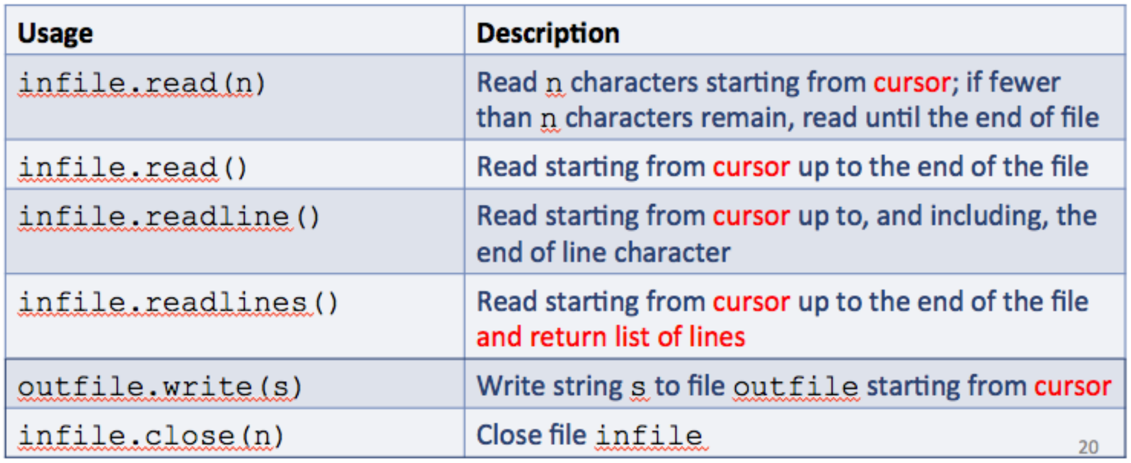
```
  for i in range(j, n, c):
```

File modes

The file mode defines how the file will be accessed

Mode	Description
`r`	Reading (default)
`w`	Writing (if file exists, content is wiped)
`a`	Append (if file exists, writes are appended)
`r+`	Reading and Writing
`t`	Text (default)
`b`	Binary

File methods



Usage	Description
`infile.read(n)`	Read n characters starting from cursor; if fewer than n characters remain, read until the end of file
`infile.read()`	Read starting from cursor up to the end of the file
`infile.readline()`	Read starting from cursor up to, and including, the end of line character
`infile.readlines()`	Read starting from cursor up to the end of the file and return list of lines
`outfile.write(s)`	Write string s to file `outfile` starting from cursor
`infile.close(n)`	Close file `infile`

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`format` method of class `str`

```
print('{}'.format(<variable>))
```

Dictionary methods

Operation	Explanation
d.items()	Returns a view of the (key, value) pairs in d
d.keys()	Returns a view of the keys of d
d.pop(key)	Removes the (key, value) pair with key key from d and returns the value
d.update(d2)	Adds the (key, value) pairs of dictionary d2 to d
d.values()	Returns a view of the values of d

Module random

random.randrange() : takes a pair of integers a and b, and returns some number between a and b-1

random.uniform(): takes two numbers a and b, and returns a float number x such that a <= x <= b

random.shuffle(): shuffles, or permutes, the objects in a sequence

random.choice(): allows us to choose an item from a container uniformly at random

random.sample(): takes an input the container and an integer k, and returns a list of k items in the container