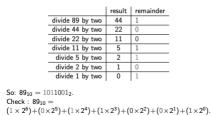
Cheatography

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Binary Numbers



Binary Numbers	
8 bits	1 byte
16 bits	word
32 bits	double word
always	add one to first number in
at least	sequence to make negative, add
1 byte	zeros to get full byte

Machine Learning

-program adjusts itself automatically to fit data, end result is a program trained to achieve a given task

Supervised learning-given examples of input and desired outputs, predict outputs on future unseen inputs(classification, regression, time series)

Unsupervised learning-creates a new representation of the input

Reinforcement learning-learning action to maximize payoff

Types of supervised learning tasks

1. classification- predict which predefined set of classes and example belongs to

2. regression - predict a real value

2. probability estimation - estimate probability of an event

Sensitivity = fraction of positive examples predicted to be positive

TP/(TP+FN)

Specificity= proportion of negative examples predicted negative

TN/(FP+TN)



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Machine Learning (cont)

False-positive rate(FPR)= negatives predicted to be positive

FP/(FP+TN)

Sets	
Set	stores an unordered set of objects, CANT BE INDEXED, no duplicates, only immutable objects contained
myset = set([])	creates a set from a list
len(myset)	length of the set
if x in myset:	evaluates boolean condition
for element in myset:	iterate through set
for set1 = A and set2 = B, A&B = inters- ection	elements in common to A and B
A B or A.union(B)	union of two sets
A-B	difference of sets, elements in A that are not in B
	all these rules can be applied to multiple sets

Integer Sequences

3	
range(start, end, step)	(start default is zero, step default 1)
range(5)	0 1 2 3 4
range(3,8)	3 4 5 6 7
range(len- (seq))	sequence of index of values in seq
range(2,12,3)	25811

Functions	
def functi- onname(arguments):	defines a function of given name with given arguments
return	only returns a certain value or string generated by the function, doesn't print, exits at this value
list = [[0 for i in range(- ncols)] for j in range(nro- wns)]	creates a two dimensional list of nrows and ncols filled with zeros

Operations on Lists	
lst = []	creates empty list
lst.appen- d(val)	adds item to list at end
lst.exten- d(seq)	add sequence of items at end
lst.insert(idx, val)	inserts item at index
lst.remov- e(val)	remove first item in the list with value val
lst.pop(idx)	remove and return item at index
lst.sort()/lst.r- everse()	sort/reverse list in place
lst.mi- n()/.max()	finds the min/max

matplotlib.pyplot	
.plot(x,y, color)	plots the x values to x values in a certain color
.show()	shows the graph
.ylabe- l(name)	names y axis
.xlabe- l(name)	names x axis
.savefig(figname)	saves image under figname

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OOP	
class	defines attributes(information we want to keep together) and methods(operations want to be able to perform on that data)
class some_c- las- s_name:	defines a class of some_clas- s_name
def int (self, other attrib- utes):	defines and initializes attributes
object.me thod()	calls method on an object of that class

Bugs	
Sytax errors	violation of a writing rule
Except- ions(r- untime)	syntax is fine, some other thing is occasionally flawed:ZeroDivisionError(can't divide by zero), NameError- (can't access the variable), IndexError(When the index you are attempting to access does not exist), TypeError(operation on non-compatible type)
Logical (semantic) errors	code runs, but doesn't do what its supposed to
try:	does something that may cause an exception
except <somee- xcepti- onType>:</somee- 	do something to handle the exception
raise[exception object]	raises a certain, defined type of exception

Bugs (cont)

try,	try something, that could cause
except,	the exception, if its fine, go to
else	else
finally:	adds statement that happens
	no matter what
for a, b	iterates over elements of two
in zip(list	lists in parallel, yields a tuple
1, list 2):	with both iterations

File Input/Output opens the file, x=r for reading f = only, x=w for writing only, x=a for open(m yfile, appending, x=b for file in binary format, x=wr+ reading and writing 'x') and so on reads the entire file, returns a .read(size) single string, size is optional number of characters reads all lines and returns them .readlas a list of strings ines(size) returns a string with the end-of-.rstrip() line character(\n) removed from the end of the string .readlreads single line from file, returns ine() empty string if end of file .close() closes file gzip.ointerface to read/write compressed files, .gz extension pen()

Operations o	n Dictionaries
dict = {}	sets up an empty dictionary
dict[key] = value	sets value of said at that key to value
dict[key]	calls the value at that key
del dict[key]	deletes a key from dict
dict.clear()	clears the dict of all keys
dict.upda- te(dict2)	can update/add associations from another
dict.keys()/- dict.item- s()/dict.val- ues()	looks at either all keys, values, or all items in the dict
dict.p- op(key)	removes element associated to that key
dict.popi- tem()	removes key, value pair and returns it as a tuple
dict.g- et(key)	returns value at that key
dict.setd- efault(key)	either returns value of the key or creates the given key if not previously existent



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