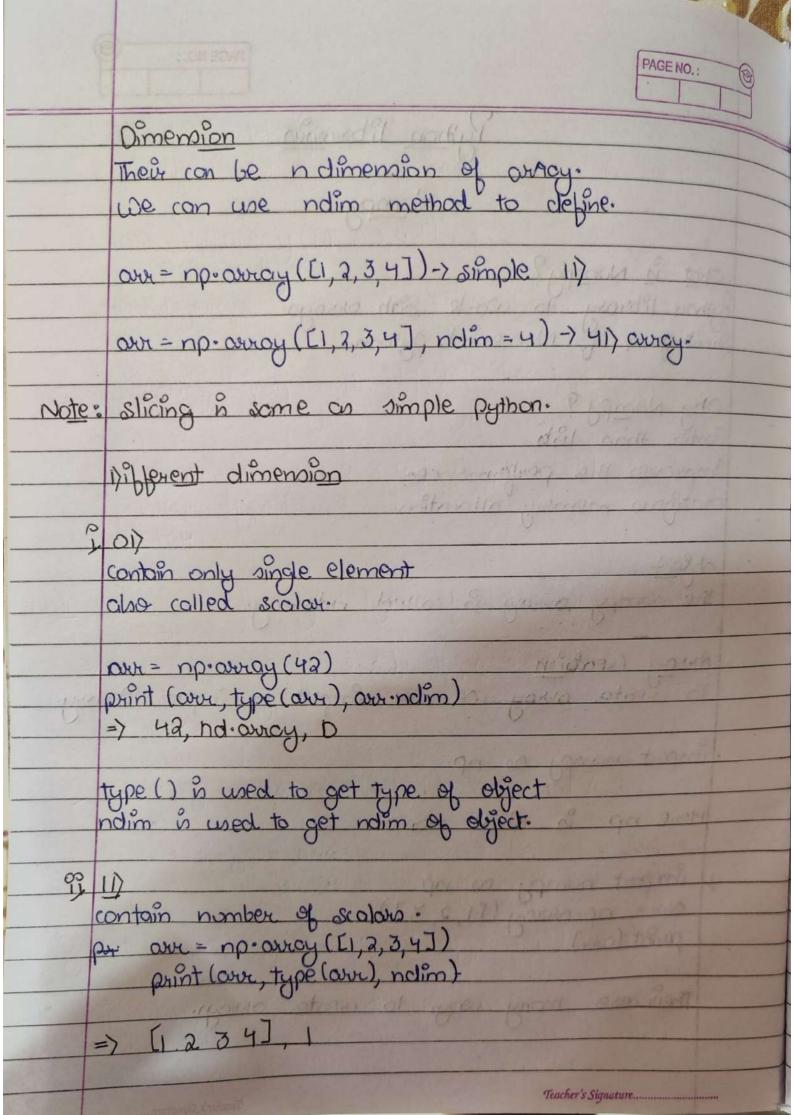
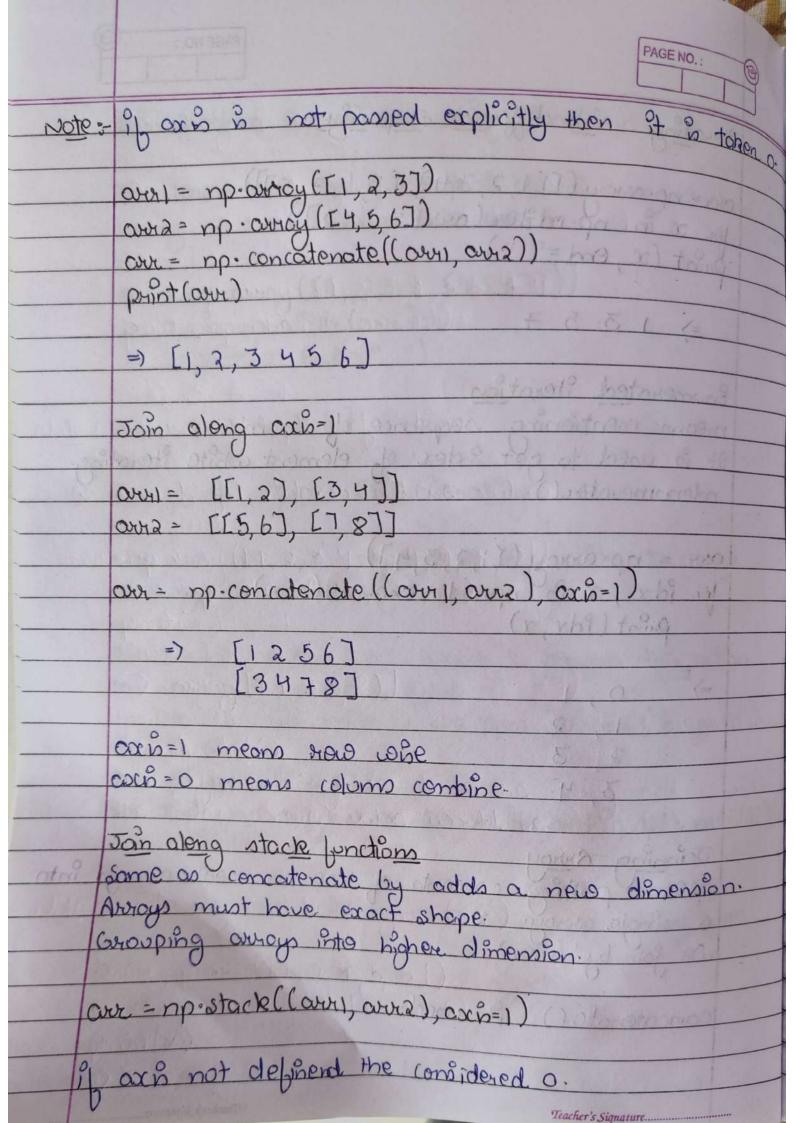
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to import library.
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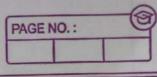
Ĭ	
B	Python libraries
	The de real be in differentiage of management
	Nompy to a second
	What is Nompy? Python library to work with arrays. Short form of Numerical python.
	Python library to work with arrays.
	Short form of Numerical python.
	why Nompy?
	Foster than lists
	Improves the performances.
	contigous memory allocation.
	40.9
	object
	The numpy away is colled indoway.
	Arriay Greation
	To create array we use import to import library.
	a wown-bot sty (a)
	import numpy as np.
	troids to a three part of Charit
	Here np is alian nome.
1	import numpy as no
_	City = np. aurcy (L1, 2, 31)
	print (aux) (TRESII)
_	(called Contract moltage
	Their are many ways to virate arrays.
_	1 [ P = 0 ] (= )



E	PAGE NO.:
000	checking that the
	contain number of vectors.
	~ · · · · · · · · · · · · · · · · · · ·
	Quint (over) ([1,2,3], [2,3,4]])
	The is 20 and
	This is 21) away It is called matrices
	The contract transcense house go set
	[[1,23]
	[234]] Ho APER A DUMO (90 = 500)
	- 10 Courth-moltage
	To slice we use
	This gives [12]
I E E I	CART = aguito [E & I] upido con = sko (=
	Note types
	15 013 (6Etch =
	Numpy has some extra data types than python and they have referred by single character.
	o broad of the creation
100	integer: i to complex bat: c
	booleon: le dotetime: M
	floot:
	ensigned into a public of the property of
	timedella: m
	objet 1: 10
	string: S
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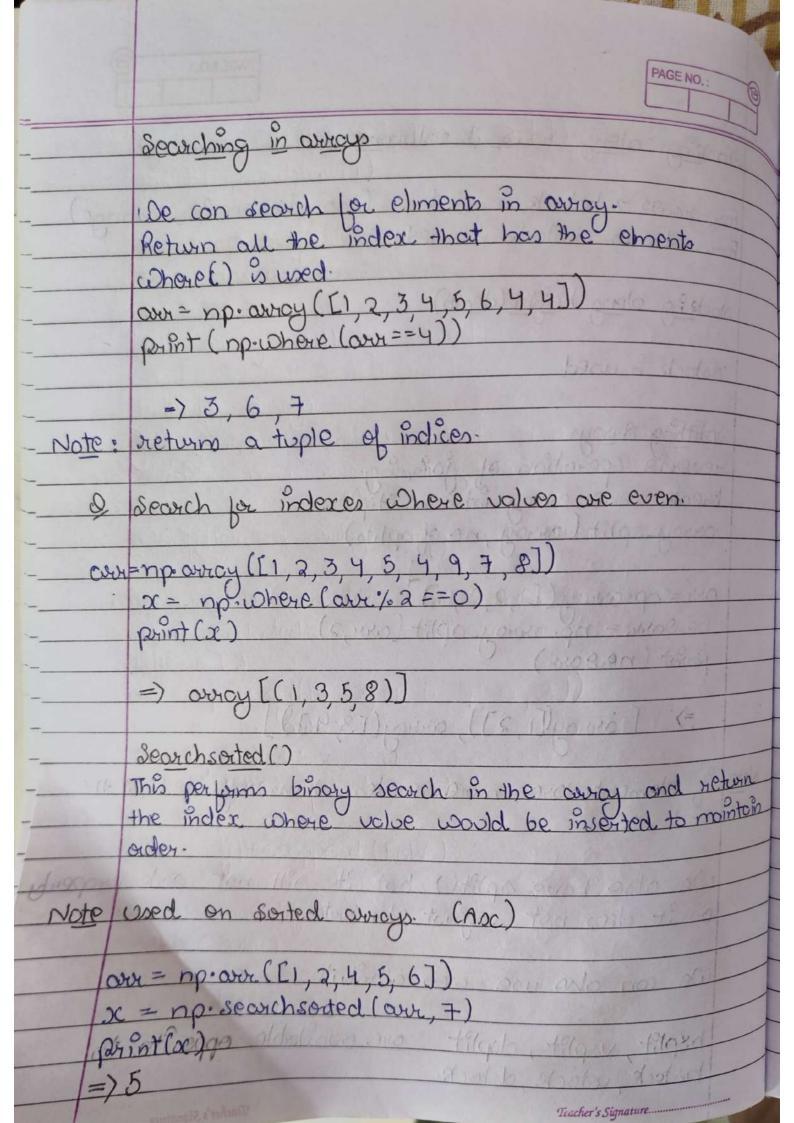
PAGE NO .: Checking data type To check dotatype a property 'dtype' is used'. aux= np. auxoy ([1,2,3,4]) print (our-dtype) =) integer. The optional arguement dtype is used. our = np. avay([1, 3, 3, 4], Otype 1= (9) Printary dtype =) int64 Note you can aloss give bytes of data type. For this => our = np. ourcy ([1, 2, 3], dtype = '34') print (aux dtype) = int32. Q what if value can not be converted? A non integer like (a) can not be converted to integer Thus it will make a value envoy. Eg our = np-array ([1, 'a', 2], dtype = 'i') # error To change datatype we can use the function 'astypell' This function weater copy of away while almoing to specify dota type as parameter.

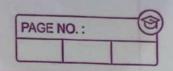




Teacher's Signature....

stacking along 4000 \$ columns For columns + ustack is used (no dimension change) stocking along height (depth) datack is used. splitting Auroys
reverse operation of joinning.
breaks one auroy into multiple.
auroy-split (auroy, no of splits). neware = np. array - sprit (arr, 2) print (newow) => [ avroy(1,2]), avroy([3,4])] Note is elements one more or less than adjusted at the we also have splite but it will not work property on it does not adjust elements. we can also use our attribute here. haplit, usplit, deplit are available apposite to hstock, ustock, dstack.





Thus 5 in output indicated that 7 should inserted at 5th index to maintain order.

Multiple values

of you want search multiple values then pass through

au = np. auroy ([1, 3, 5, 7]) x= np. search sorted (aur, [2,4,6]) print (x)

=)[1,35]

Sorting Aurays

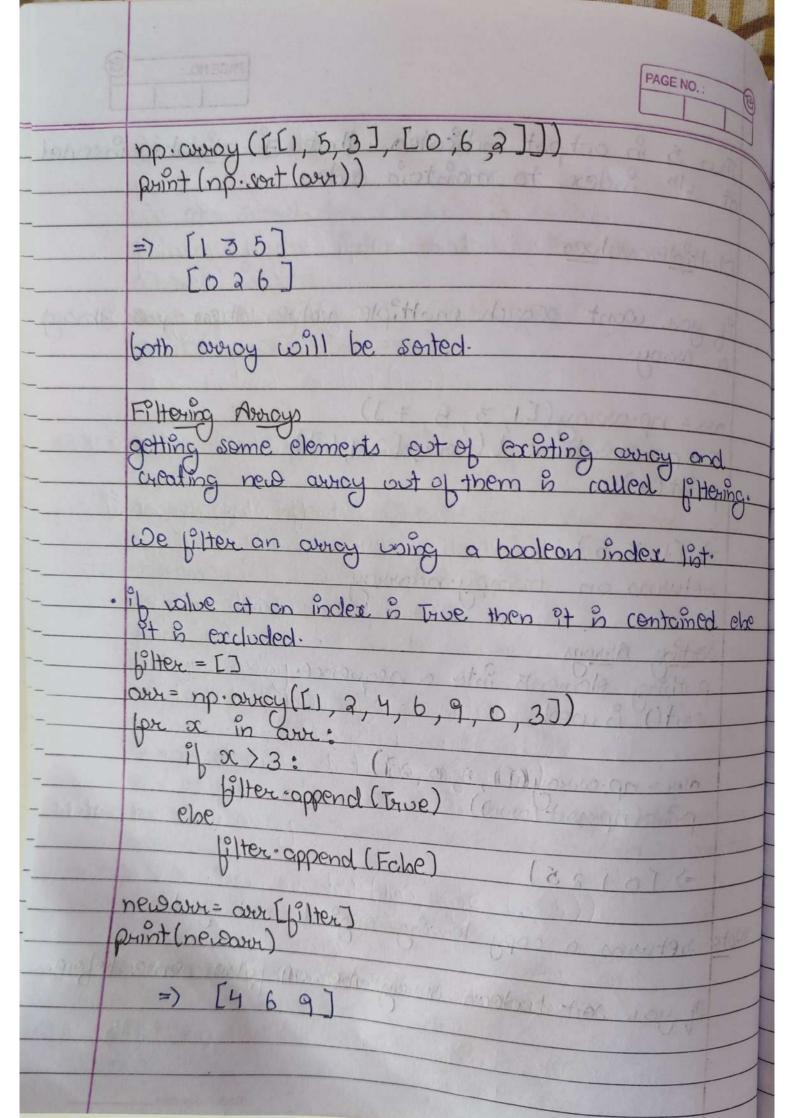
putting elements into a sequence.

print (nposort (over))

=) [0125] (1/57] [1/67]

Note returns a copy leaving original unchanged

9) you soit booleon array the all labe come before.



	PAGE NO.:
- 10	
con filter directly from away	M Staronse)
The state of the s	alla ramora
ων = np· αντου ([1, 2, 3, 4, 5, 6])    19   ter = (αντ. 2 = = 0)    new αντ = αντ [[9] ter]    Print (new αντ)	
filter = (wor% 2 = = 0)	STRUE THEAT
newow = our [ ] Her]	-10
Print (neworn)	240191120 07 1
=> [2 4 6]	malmont & B
	COLDERAND
Random	otomog and C
0 .	
	othernon of il
A number that can not be predicted by	y logic.
And the same of th	
	whom ex !
If there is a Program to generate ro	ndom number, it
on be predicted, thus it is not truly	random.
a sea - A's commenter that a commenter	t. ()talkross
Numbers generated through generation	
random. ((2)=920 and) Talkane	moleron ex
the state of the s	

Note Numbers generated through generation random. ((2)=920 (01) 7

To make truly random number we need to get the random data from atside source. Keystrokes maise movements etc.

Truely random when it comes to security.

PAGE NO. Generate Random Number compy offers random module to work with number "from nompy "import random". ? To generate integer 2 = random · randint (100) =) This generates random number from 0 to 100. To generate float random float between 0-1. 2 = random rand () Integer arroy randint () to be size parameter. x = random randint (100, size= (5)) Note- For 2) away. Manage make and 2 = random randist (100, size = (3, 5)) 3-7 no of rows.
3-7 no of elements in each row.

PAGE NO.:		1

float courcy

rand() takes arguement for shape of array.

oc= random.rand(5)

=) creates 1) away with 5 values 0-1 each.

oc - random. rand (2,5)

=) creates any away with a rown hoving 5 elements:

Random Number from Array

choic() method helps to de it.

order of the protocollistic of

vieturns a rondom value from the away possed to it.

import nompy comp whose transform

from numpy import random as im

are= np. array ([1, 3, 7, 0, 10])

x = rm-choice (ovr)

print (x)

=) returns a rondom value from our.

size operator works here also.

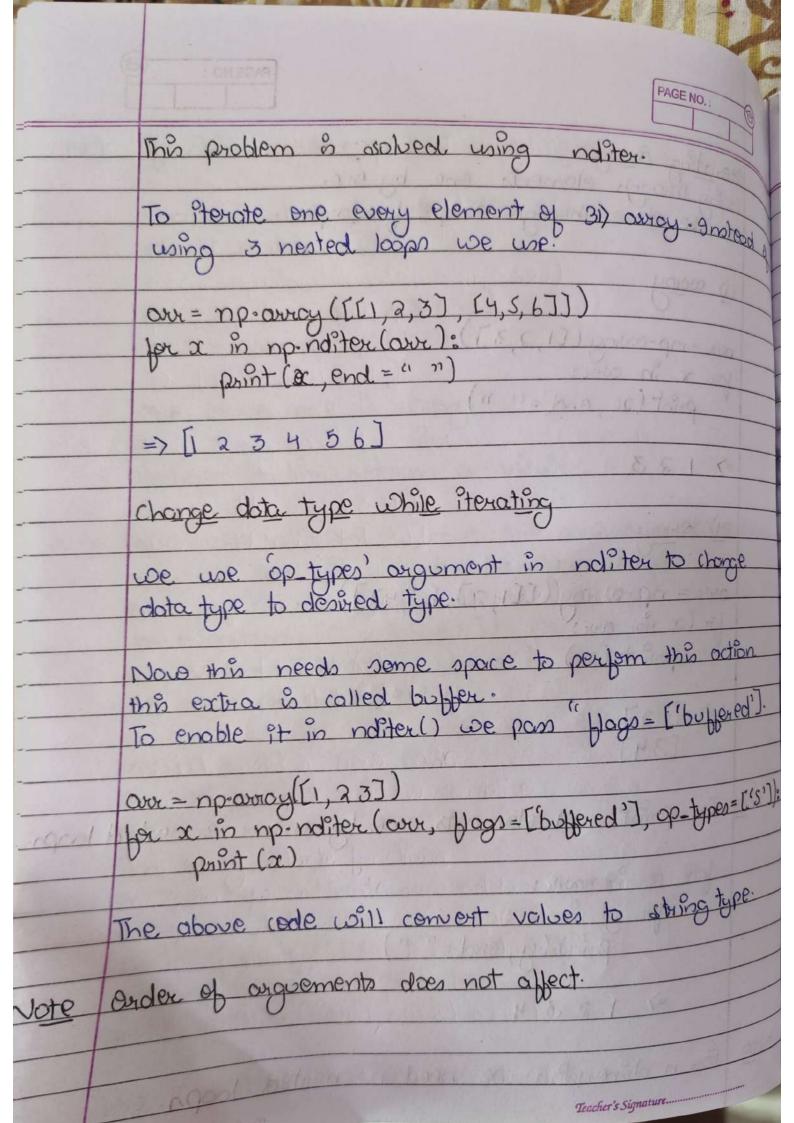
=) oc = 2 m·choice (our, size=(3,5))

=) return 03 array with 5 values each

PAGE NO.: 1) cta 1) intribution lists of all penibles values and has often these values Radom 1) bti bution Set of rondom number that follow certain probability density function. choice () allows up to specify probability for each whe Probability & 0-1. Sum of all probabilities should Note soul outer realize import numpy as np. from numpy import rondom on urm aux = np-auray [[1, 3, 5, ] 9] Prob= pp. array ([0.2,0.1,0.4,0.0,0.3]) x= rm.choice (aur, p=prob, size=(100) (x) tains p-> 9+ % for probability => creates loo integers from our and with given size con also be used for all aways. Note

PAGE NO.:		<b>-</b>

	Herating with different step size
	ONLY = np. ONLOY ([[1,2,3,4], [5,6,7,8])
	to a in no mother (and [: :: 2])
	print (x, end =" (")
	CHEO) taling
1	=> 1357
	(dept = 1) (= 1)
	Enumerated iteration
	mean mentioning requence of numbers. It is used to get index of element white iterating.
	ndenumeratori)
	TETT THE CHECK
	ave = np. avroy ([1,2,3,4])
	for idx x in np. ndenomerate (over):
	Print (idx, x)
	1 1 2 5 6 J
	=) 0,1 [REHE]
	1, 2
	3, 3 0808. 000 000000 1=000
	3, 4. male o condo como acasa
	Johning Awroy
	means potting contents of two or more overus into
	a single arroy.
	we join by 'oxes'.
	means potting contents of two or more our onto one foin by oxes?
	concatenate () is used.
	The state of the s
	O hashiren adl braston to see 8



	PAGE NO.:
	Iterating Arrays
	boing through elements one by one.
toi	con be done through simple for 100p.
	The sex could be trace & prices
	1) orach
	(1T) P) (E G 1)7) LONGO-OCC = REO
	print (2c, end = ")
	for oc in over:
	print (2c, end = (1 ))
	non the second of the second o
	=> 123
	dona data tupe 10810 ilevative,
	SI) AMOY
	and at softling it seemoon (good 00 on 900
	ONE = np. avyoy ([[1,2], [3,4]])
	for (x in our:
-	print (oc) a man and home
	and the color of the second della second del
1/1/2	=> ([V2Joll cognoca Oyoftha 2 4 adding
	[34]
	The Manuscript of the Commence and
bje	To print all elements one by one use nested loops

for a in out:

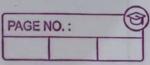
for y in ac:

print (y, end = ""

=> 1234

Me For n dimension we need no nested loops.

	PAGE NO.
Note	function reshape () is used.
	con convert to any dimention but no of elements should match.
	· TIBLE SOLUTION
	new = au. 4eshape (3,2)
-	new = aux. 4eshape (3, 2)
	The above code is wrong.
	Reshape function returns a view.
Note	De are allowed to have one unknown dimention pass -1 and it will convert automatically.
	aux= np. auroy ([1,2,3,4,5,6])
	print (arreshape (2, -1).base)
-	neware= arr. neshape (2,-1)
-	> 16 a a7
	-> [[, 2, 3] [4, 5, 6]]
-	Flattering Aurou
	Any away can be converted to ii) away.
	mul= no. 0440. [[[]] 23] [ (7]]
	newsorr = our reshape (-1)
	print (new our)
	=> [123456]



Note	All rows must have some no of elements.	otola
	np-array ([[1,2],[2,4,5]]) => Erran	
	editara hisada	
	or use dtype object.	
	(LOF C. C. L.) J. WORKED - OFC = 3/60.	
	create a 5 d'imension average	
	np.auroy ([1, 2, 3], ndim=5)  print (aur.shope)  => (1, 1, 1, 3)	
	print (aux-shape)	
	=> (1, 1, 1, 3) will a countrie actional agardent	
a St	Restaping Aurous and of magalla and all	otok
	changing the shape of aways.	
		BULLE
Ĵ	change 11) to 21) (Idan & (1) monday	
	(900d) (1- () 300d(Sue, 100) +329	
	over= np. overcy ([1, 2, 3, 4, 5, 6])	
	print ("current shope:", our shope, ndim.)	
	newar = arriveshope (3,2)	
	print (newar, neware-ndim)	
intelli	The politica on the same and the	8 10000
	=> 6,1 power small of	
	and an antique of an union with	
	[3,4]	
	[5.6]]([1] R.C. [7] DONNO ON - AND	0.00
	(1) agodoscino = sino an	
	( masser) tong	

	PAGE NO.:
Note	copy should not be affected by change in original overay while view should be.
0,	check of Array own it data?
	Numpy offers a cittibute to check if array and its data or not.
	9t & called bose! Returns 'None' if ourcy owns dota. Return original object otherwise.
	$\alpha = \alpha r \cdot (\alpha r)$ $\alpha = \alpha r \cdot (\alpha r)$ $\alpha = \alpha r \cdot (\alpha r)$
15336	$y = \frac{\text{our.view}}{\text{opi}}$
	print (x-bose) print (y-bose)
	> None [1 2 3]
8	and the second s
• 10	Shape' attribute returns tuple with each index has
	we = np.aurcy ([[1, 2, 3], [5, 6, 4]]) wint (aur. shape)
	(2,3) Teacher's Signature

PAGE NO.:		<b>@</b>

	import numpy as no	1-1
	our = np. ovnoy ([1.1, 1.2])	
	newow = our ontype ('i')	
	print (nework, dtype)	
	, 0,	
-00	=> [1.11.2], int64	-
	the dolor of all the state of t	
	Arrian Copy 1300 1500 8 th	
	copy is a new array.	
	copy owns the data and changes to it does not	
	effect original array and vice versa.	
	(18 5 (2) HORRO GA = 1840)	
	ou = np. away ([1, 2, 3])	WIL
	x = our-copy() () & our - our - our	
	aux[0] = 42	
18 8	print (our) (gent of the g	
	print(x) (gooden) tond	
	The contraction of the first research to the contract of the c	
	=> [42 2 3]	
	[123]	
	Away View of original away.  view does not owns the dota, any changes to it affect original away.	
	Visco is just visco of original auroy.	
•	view does not owns the data any changes to it	
	affect original array.	
	x = our. view() (42 2 3)	
	Over[0] = 42 [42 23]	
	print (aux)	
	print (oc) (x c) (=	