Genetic Algorithm



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Data Science

Semester : Subject :					Academic Year: 20 - 20			
Max	Marymize the function fox = x2,					where & value		
ran	to from			3.19	• •			
·	0 '		•					
king	Enitial	X	F(x)	Probability	Expected	Actual		
no.	Population	value	Value	count	count	count		
	01101	13	169	0.14	0.58	1		
2	1+000	24	.576	0.49	1-97	2		
3	01000	8 .	64	0.06	0.22	. 0		
. 4	10011	19	36	0.51	1.23			
	. : Tot	al .	1170	1	4	E		
	,	1	293					
			576		0			
	•		- ,					
	Prob	abili'm	Count	= f(x) _ 1	69		
	5	9		Tol	-al 11	70		
			-	•				
	Earka	a beal	Consist	- F(X)	169	1992		
	: sepe		COCIVOL 2		293	5		
	•			0				
	0	Λ4 . L.,	la'ma '			 		
(20	ssore) &	Mura	MOYI.			_		
01.1		11 6 42	12	2460.0	1 1 0 0			
Shing 2 : 11000				Strong 2: 11000				
s ho	ng 1;	0110)	518rg 4 :	100			
		An	1.4					
•	Max ran Rirry no.	Probessores & String 2: String 2: String 2:	Maximize the fund range from 0-2 Peirry Enithal X no. Population Value 1 01101 13 2 1+000 24 3 01000 8 4 10011 19 Probability Probability Probability Probability String 2 : 1100	Maximize the function of range from 0-31. Painge from 0-31. Painge from 0-31. Probably of the function of the range from 0-31. Probably of the function of the range from 0-31. Probably of the function of the range from 13 169. Probably of the function of the range from 170. Probably of the range function of the range from 170. Probably of the range function of the range from 170. Probably of the range function of the range from 170. Probably of the range function of the range from 170. Probably of the range function of the range from 170. Probably of the range function of the	Maximize the function $f(x) = x^2$, range from $0 - 3$] Pairing Enitial X $f(x)$ Probability no. Population Value Value count 1 0110 13 169 0.14 2 1+000 24 .576 0.49 3 01000 8 64 0.06 4 10011 19 36 0.31 170 170 17	Maximize the function $f(x) = x^2$, where x range from $0-3$ Thirty Enimal x $f(x)$ Probability Expected no. Population value value count count 1 0110 13 169 0.14 0.58 2 1+000 24 .576 0.49 1.97 3 01000 8 64 0.06 0.22 4 1001 19 36 0.51 1.23 1001 19 36 0.51 1.23 Frobability Count = $f(x)$ 169 Avg 293 (mossove) & Mutahon: String 2 : 11000 String 2 : 1100 String 1 : 011 0 String 4 : 1000		

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	/
1000	11000
01101	10011
	! r -
crossover	crossover
11001	11011
01100	10006
	A. A
String No. offspring x ~v	alue fex)
01100 12	
	625
	7 729
4 10000 1	6 256
	sum 1754 - Av
Max	
χ (1 (βεγ ²)	
X-	Sum =
Afra mutation of	(x)
01100 11100 26 6	76
11001 (100) 25 6	25
	29
	24
, , ,	354
	5885
	729.
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3	· Maximize the value of the function		
	$f(x) = -x^2 + 2x$!!	d-
	over the range of real number from 0	10 2 WIT	N.
	initial propulation 11010,00111, 10110,	00101 W	ol m
	random number 0.4,0.15, 0.7, 0.9.		
	-> Select and I'm I'm		
	-> Select encoding technique.		
89	min. ralue! 0 man. ralue!		
	Encoding technique 9s already gir	ren	
(41)	Select initial population	0)	
	to stuff with sold initial		
_	Individual 1: 11010	pulation	ore ando
-	_N _ 2: 00/11		
));—			
	4:0000	I II	
-			
-	-> Enifial population dize: 4		 ,
=	Decode 'endiridual into real numb	sel 50	
	(1) $11010 : 11010 \rightarrow 0 + (2-0) \times (25-1)$	31	=1.677
_		$(7) = \frac{1}{3}$	4 = 0.45]
_		6.17.6	
(9)	(25-1)	- 44	1.419
_		.27	

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4 0010	1: 00101 -> 0	+(2-0) +(5) = 10	= 0.32	2
		(25-1)	21		<i>j.</i>
<u> </u>	· · · · · · · · · · · · · · · · · · ·				
	ritial x-va	lue fitness	Prob -2x count		alike enterval
No. Po	pulation	(1)		- 1	
1 11010		0.541	0.21	0.48	0.22 100.48
2 00 1 1	1 1 1 2	0.824	0.32	0.8	0.49 100.8
3 10110	0.00	0.541	0.12	1	018110
4 0010	1 0.322	2.6056	*	, 8 f	
Sum		0.6514	, , , , , , , , , , , , , , , , , , ,	- P	
Avg.		0.824			
Max					-
	Probability =	f(x) =	2.6056		
	- Y-1 Ai-ala WIX		ers.		
Now con		Region 22 10.0-48	chosen s	shong.	<u>. </u>
		o to 0.21	11010	t	
- 1 hal w		49 to 0.8	10110		
	0 1	81 10	0000		
	0,9	0 ()			
			4		

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crossover points: 1st & 5th oligits



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_	> (mssove)		
		part swap busts of	the members solution
	to create offs	pring which are a r	nixture of the parents
	+ for the f	irst pair of string	.: 00111 . 11010
	-> (nossing	these two strings	at that wiln't
	yeild: 0		
li t	00111 -	> 0 011 1	01011
1 * 4	11010 -	+ 1 101 0 -s	10119
		s in the second	
	to for the se	cond pair of string	15: 10110,00101
- 1			,
1 42		1000	0100
	00101 ->	0	0111
Shing	New X-value	•	
No	Population	f(x)	
1	01011 0.709	0.915).
2	10110 1.419		
3 _	10100 1.29	0.915	
4	00111 0.45	0.699	<u> </u>
_	(01011-) 0	+ (2-0) x (11)=	22 - 0.709
/		(25-1)	31
	10110 -> 0	+ (2-0) y (22)	= 44 - 1.419
_		(25-1)	~ 1
	\rightarrow 9	um = 3.3548.	
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•	Subject Incharge :	Man = 0.915	



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10100 ->	0 +	(2-0)	* (2	20)=	3)	= 1:	29	
00111	0+((2-0) 2 ⁵ -1)	x (7)=	31	_ 0	45)	
Previous it is	Man.	value	was	0.83	<u>2y '</u>	aftu	1 SA	enosat 1
			,		1			
					Si .			
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