

COMSATS UNIVERSITY ISLAMABAD, ABBOTTABAD CAMPUS

Assignment # 01 - Artificial intelligence

Submitted by:

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FA21-BSE-019-6A

Submitted To:

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Genetic Algorithm (Minimization Problem)

Minimize the value of the function F(X) = X1/6 + 1/3 * X, over the range of real number from 0 to 2 with initial population ['10010', '10111', '11110', '01101', '10100', '10101'] and with random numbers [0.15, 0.30, 0.50, 0.60, 0.75, 0.90], adjust the numbers in range of 0 to 2. Select the crossover between the first and fifth digits. Run the algorithm in 2 iterations.

	Genetic Algorithm
	(Minimization Problem)
	Population.
	2600 10010nt> 18 1dien 18 dicolors
	10 (1) 1 - 23 de 110 110 110 1
	111161 -> 30
	0101 > 13,000 (010)
V	log 10 \$10 D → 020
T.	(010) - 121 1 Total
	10.0
	fitness function $fx = x^{1/6} + 1x$
	5 PVA 10 PV
	Middle = tability
	Decoding
	U
	Scaxled values (X).
	2
	$\frac{10010 = 0 + (2 - 6) \times 18}{31 - 0} = 1.1612$
	$ 10111 = 0 + (2 - 0) \times 23 = 1.483$
	01111 020 31-0420 -538-0
	$\frac{1}{31-0} \times 30 = 1.935$
	$01101 = 00 + (2-0) \times 13 = 0.838$
	$10100 = 0 + (2-0) \times 20 = 1.290$
	CREATE LATER AND ADDRESS OF THE ADDR
	$ 0 0 = 0 + (2-0) \times 21 = 1.354$
	31-0'

(12-12-13A)				
DATE: _/_/ FAM-BSE - 019		, DATE://		
String initial X f(x) Prob		cdf	Range	
No. Pop.				
of the state of th		123	x/z/x	
1 1011, 100109: 11111 16) 38331-4121001000157	1.110	001571	1. 014.01121 331	
2 10011 10111 10251. 48315 442 1.5620 41 10.174	6 33	0.331	0)-158 120 . 33/11	
3 11 011 6 1. 80(1-935 105 1-76) 11 1910 196	0152	0.527	01.83814 0.27.	
4. 01101 0.060.835. 846 1.048.1010.13	90.66	0.666	1. 01/15,2801-01-666	
5 10100 10010 290 1008 10473 1640 16	40.03	0.83	1. 1031667104 6.183.	
66 10101011 1201, 3541 605 10503 11 1016	7 7	1	1. FOISHILL SUS.	
total s total				
Sum = Efx = 1 1 100 100 100 100 18 1959			ranspeas s	
Average = 11/1/493			2002 PM = 2	
Mini(x) = 11+348			2nd iteration	
Present Commence of the second				

	Range Random No's	Choosen
	0	string
		- U
	0-0.157 0.15	0000
	0.158-0.331 0.30	10111
Man de la companya de	6:332 - 0:527 0:50	11110
	0.528-0.666 0.60	01101
	0.667 - 0.83 0.75	10100
	6.84 - 1 0.9	0 10101
	0.89	
		C C L

C	Cross over						
10010	->	10110					
10111	->	10011					
titlo	->	11100					
01101	->	01111					
10100	>	10100					
10101	->	10101					

ENCIT . I =
2nd iteration
10110 -> 22
10011 7 19
11100 -> 28
0 MM = 15 - 25130 1 0 0 1 1 - 0 - 0
10100 - 20 88.0 - 15.0
10101 → 21 - 10200 - 15 · 0 - 15 · 0
11110 , se sã são 22-0 - 82-0
Decoding and 2500 - 120
101010 of. d _ 1 - 10.0
$10110 = 2/31 \times 2^2$ $0111 = 2/31 \times 15$
[31
10011 = 2/31 x1-9 00100 = 3/31 x20
motores los de calendar mant sel si
11100 = 9/31x 28 10/01 = 2/3/x21

	2.10
DATE:/	1019
Page 10 Page 11 Page 12 Page 200 1	1
	cdf
No Pop. (X) \$(X) \$x/2fx	
111111111111111111111111111111111111111	0:17
10011 1011 10225 10 10 10 442 10 00 160	ALC: NO.
30111110011011111.8061.901.705.00.7001900	0:0:
1110 0111 12110 967 111316 120146	0.00
2 10100 1011-290 311-473 7-11010164511	10 10
G101 10101 0010111.354 - 11.503 12.163167-1	1
10101 = 10101	
Sum (Efx) = 8 - 972 989	
Auerage = 1.495493	
Min (10x) 1.316 76	
= 01101	
Ronge Random () Pl String ()	
no's 35 selected	
0-0-170 0.15 21 4011610	
0.171-0.3310, 0.30 05 -10011)11	
0.34 - 9.52 0.50 18 = 1111 00	
0.53 - 0.66, 0.60	
0167 - 0.83 10-75 616 (101000)	
0.84 - 1 - 0.90.	
aix sails 1 ssects = rotton	
15 /m 1st orteration Minflx) = 10298 which	
is less than minf(x) of and item	tion
1 1/10 3 1/16/17 1 38 X 13 13 13 100 111	
104	
1.2	
1 2 → generations	