COMP SCI 5401 FS2017 Assignment 2c

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December 3, 2017

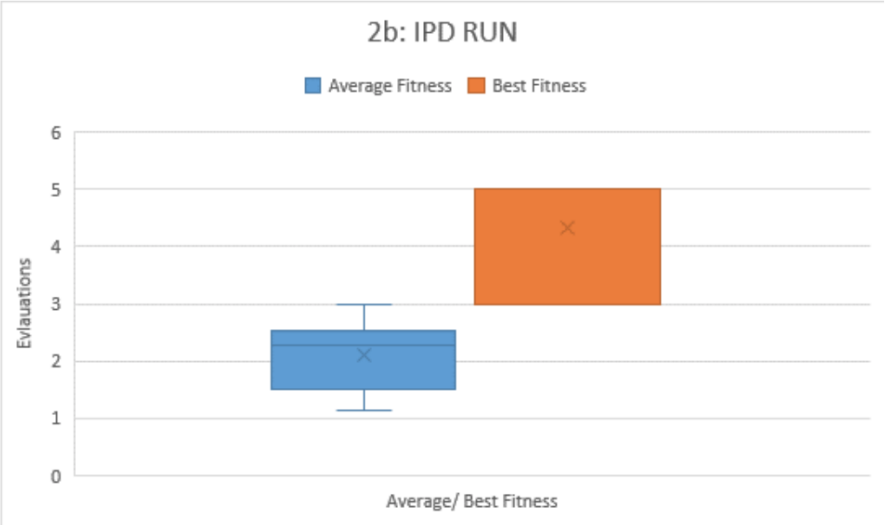
MOEA Explained

For this experiment I decided to go with a fairly simple approach for my CoEA. So I have a configurable variable called CoevolutionaryFitnessSamplePercent that can be set to any percent a user likes, this variable should be in the form of % (so 100 would be what it would be set at for 100%), it will get converted into a percentage during the execution of the program automatically. Once I had that variable all that was left was to get the number of opponents each bracket would have. In order to do that I simply make a variable that was set to the formula $(\mu + \lambda - 1) * CoevolutionaryFitnessSamplePercent$ in order to obtain the number of opponents for that experiment.

Experiment parameters and graphs

1 IPD Results

1.1 Graphs



1.2 Result Tables

Problem 1a: final results

	A	B	C	D	E	F	G	H
1	2b: IPD RUN						2a: IPD RUN	
2	Run #	Average Fitness	Best Fitness				Run #	Best Fitness
3	1	2.4	3				1	3.4
4	2	2.18	3				2	3.4
5	3	2.53	5				3	3.4
6	4	2.37	3				4	3.4
7	5	2.52	5				5	3.4
8	6	1.93	5				6	3.4
9	7	2.6	3				7	3.4
10	8	1.53	5				8	3.4
11	9	2.8	3				9	3.4
12	10	1.13	5				10	3.4
13	11	2.98	5				11	3.4
14	12	2.22	3				12	3.4
15	13	2.93	5				13	3.4
16	14	2.68	5				14	3.4
17	15	2.32	5				15	3.4
18	16	1.4	5				16	3.4
19	17	1.25	5				17	3.4
20	18	2.48	5				18	3.4
21	19	1.62	5				19	3.4
22	20	3	3				20	3.4
23	21	1.47	5				21	3.4
24	22	1.65	5				22	3.4
25	23	2.08	5				23	3.4
26	24	2.45	3				24	3.4
27	25	1.33	5				25	3.4
28	26	1.25	5				26	3.4
29	27	2.35	3				27	3.4
30	28	1.4	5				28	3.4
31	29	2.5	3				29	3.4
32	30	2	5				30	3.4

1.3 Statistical Analysis

	A	B	C	D	E
1	Average Best Fitness				
2	subject #	Fitness 2a	fitness 2b	x-y	(x-y)^2
3	1	3.4	3	0.4	0.16
4	2	3.4	3	0.4	0.16
5	3	3.4	5	-1.6	2.56
6	4	3.4	3	0.4	0.16
7	5	3.4	5	-1.6	2.56
8	6	3.4	5	-1.6	2.56
9	7	3.4	3	0.4	0.16
10	8	3.4	5	-1.6	2.56
11	9	3.4	3	0.4	0.16
12	10	3.4	5	-1.6	2.56
13	11	3.4	5	-1.6	2.56
14	12	3.4	3	0.4	0.16
15	13	3.4	5	-1.6	2.56
16	14	3.4	5	-1.6	2.56
17	15	3.4	5	-1.6	2.56
18	16	3.4	5	-1.6	2.56
19	17	3.4	5	-1.6	2.56
20	18	3.4	5	-1.6	2.56
21	19	3.4	5	-1.6	2.56
22	20	3.4	3	0.4	0.16
23	21	3.4	5	-1.6	2.56
24	22	3.4	5	-1.6	2.56
25	23	3.4	5	-1.6	2.56
26	24	3.4	3	0.4	0.16
27	25	3.4	5	-1.6	2.56
28	26	3.4	5	-1.6	2.56
29	27	3.4	3	0.4	0.16
30	28	3.4	5	-1.6	2.56
31	29	3.4	3	0.4	0.16
32	30	3.4	5	-1.6	2.56
33	SUM:			-28	52.8
34					
35		t-value:	-0.18387		df: 29
36		P-Value:	0.8554		t-value: 2.045

So according to the statistical analysis (shown above) the p-value for the best fitness is not low enough to say that the results are statistically significant. That means that the t-value of -0.18387, computed using the tables given, were not far enough apart from the t-value given of 2.045 to make the difference in the fitness values statistically significant.

1.4 EA Configurations

If you want to get the same results you have to change the newSeed variable to 0 (Zero) in the configuration file in order to use the previous seed.

Using config1.txt

```
runs = 30
fitness = 10000

k = 5
d = 10
l = 30
n = 5
mu = 0.01
lambda = 2
parentNumber = 5
p = 1
terminationEvals = 3


prob_log_file = logs/log1.txt
prob_solution_file = solutions/solution1.txt


Initialize: Ramped_halfandhalf = 1

parentSelection: Fitness_Proportional_Selection = 1, Over_Selection
    = 0

Recombination: subTree_Crossover_Recombination = 1

Mutation: subTree_Crossover_Mutation = 1

survivalSelection: Truncation = 1, kTournament = 0

bloatControl: parsimonyPressure = 1

Termination: numEvals = 1, noChange = 0

newSeed = 1
```