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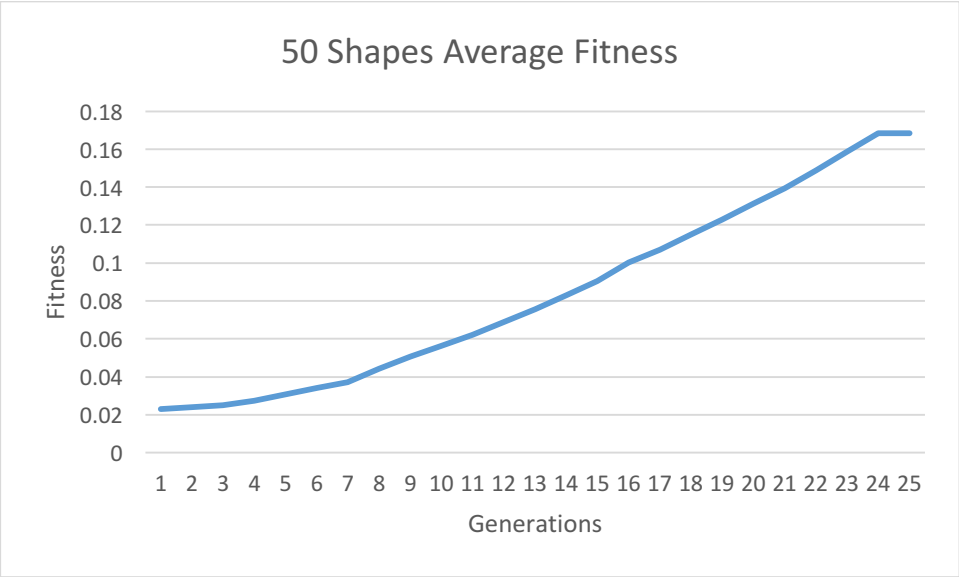
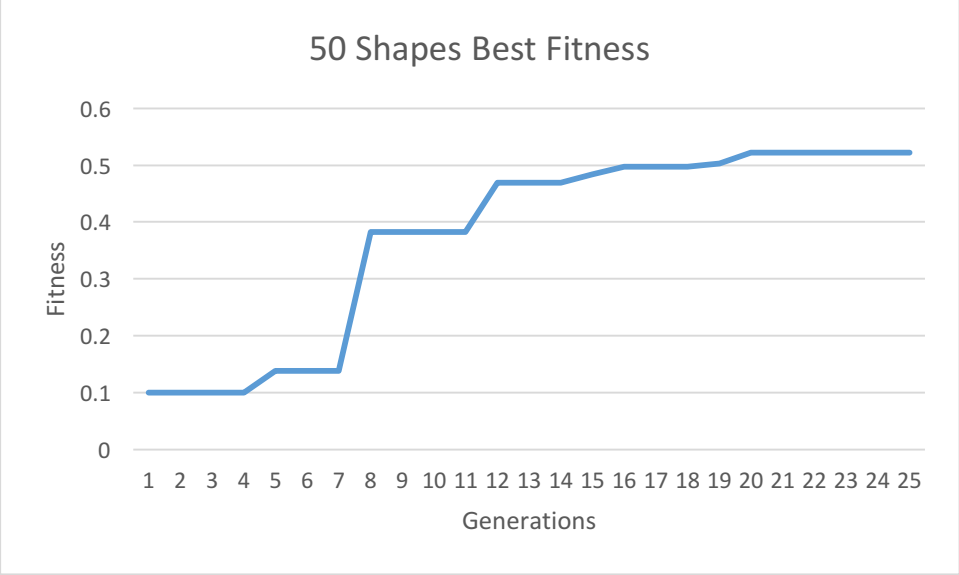
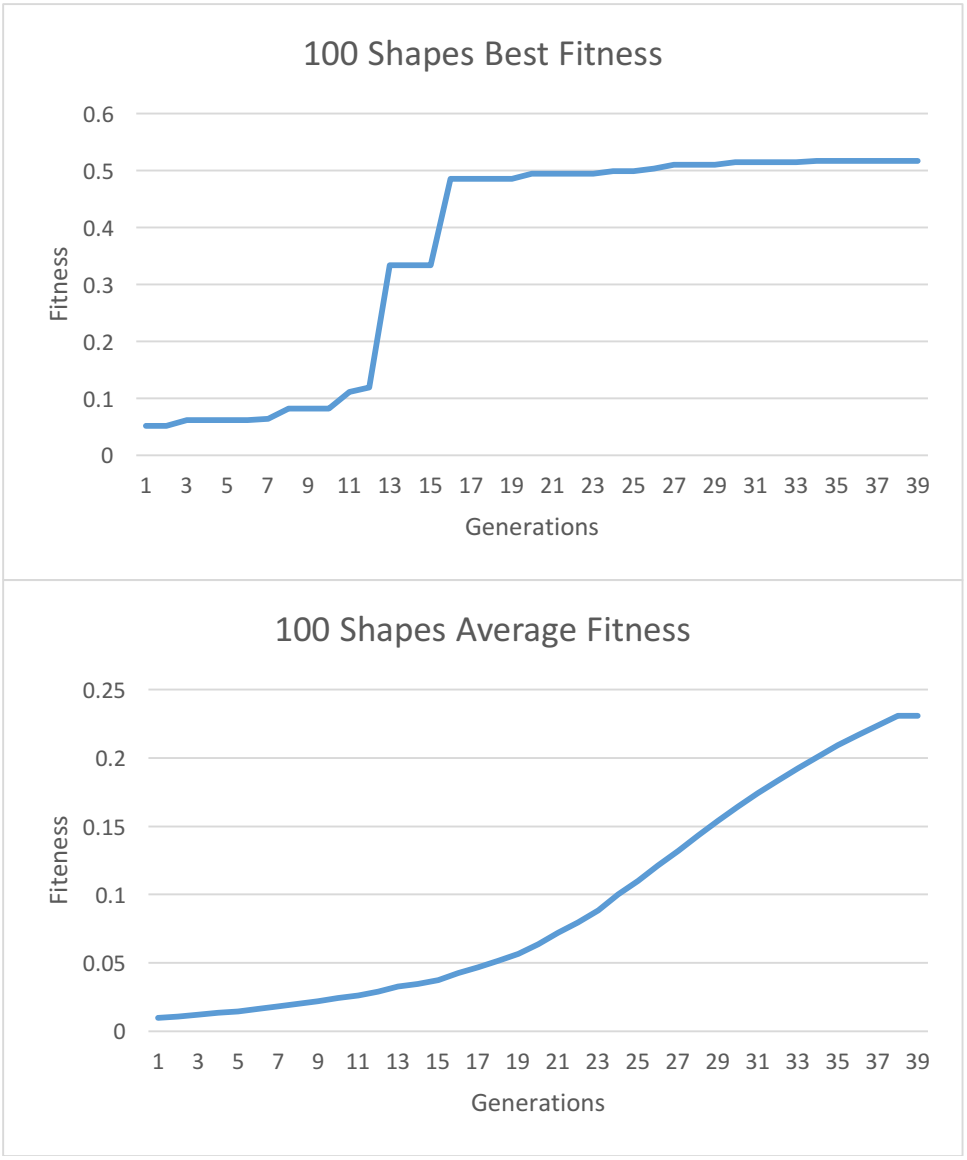
COMP SCI 5401 FS2017 Assignment 1b

50 Shapes

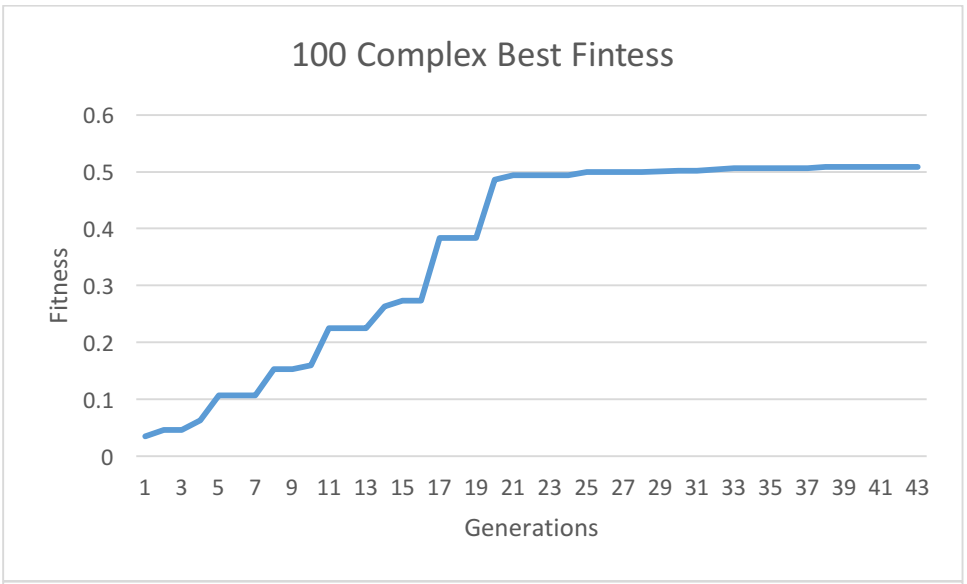


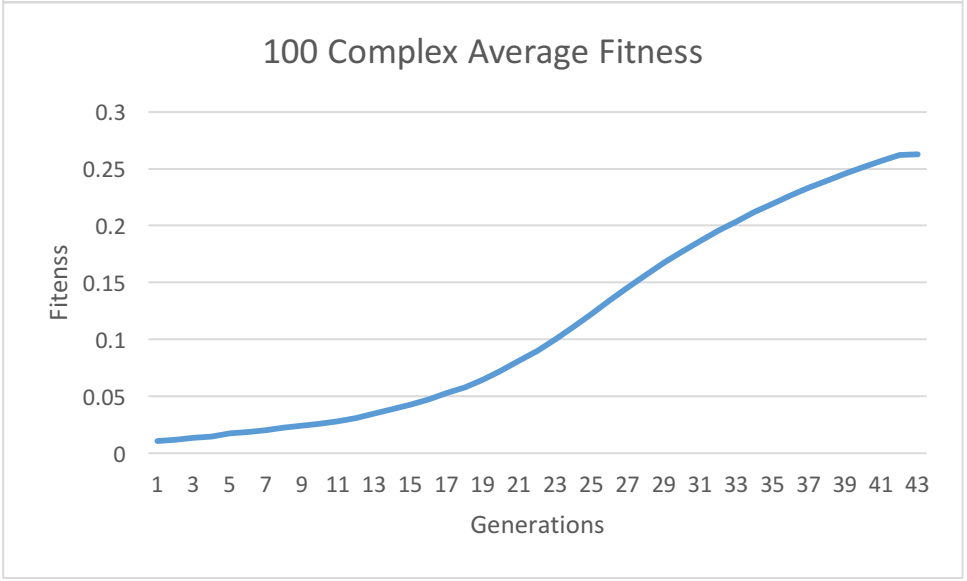


100 Shapes



100 Complex Shapes


100 Complex Best Fintess
Fitness
0.6
0.5
0.4
0.3
0.2
0.1
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43
Generations


100 Complex Average Fitness
Fitenss
0.3
0.25
0.2
0.15
0.1
0.05
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43
Generations

50 Shapes Statistical Analysis

50 Shapes F-Test Two-Sample for Variances

	EA	*Random*
Mean	0.379555423	0.041888666
Variance	0.026427848	0.001780388
Observations	30	30
df	29	29
F	14.84387204	
P(F<=f) one-tail	6.9447E-11	
F Critical one-tail	1.860811435	

50 Shapes t-Test: Two-Sample Assuming Unequal Variances

	EA	*Random*
Mean	0.379555423	0.041888666
Variance	0.026427848	0.001780388
Observations	30	30
Hypothesized Mean Difference	0	
df	33	
t Stat	11.01186725	
P(T<=t) one-tail	6.86368E-13	
t Critical one-tail	1.692360309	
P(T<=t) two-tail	1.37274E-12	
t Critical two-tail	2.034515297	

Reject null hypothesis.
Conclude that EA is better than random search.

100 Shapes

100 Shapes F-Test Two-Sample for Variances

	Variable 1	*Variable 2*
Mean	0.311331862	0.087205108
Variance	0.040077386	0.001933418
Observations	30	30
df	29	29
F	20.72877439	
P(F<=f) one-tail	8.93574E-13	
F Critical one-tail	1.860811435	

100 Shapes t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.311331862	0.087205108
Variance	0.040077386	0.001933418
Observations	30	30
Hypothesized Mean Difference	0	
df	32	
t Stat	5.989269185	
P(T<=t) one-tail	5.59837E-07	
t Critical one-tail	1.693888748	
P(T<=t) two-tail	1.11967E-06	
t Critical two-tail	2.036933343	

Reject null hypothesis.
Conclude that EA is better than random search.

100 Shapes Complex

100 Shapes Complex F-Test Two-Sample for Variances

	EA	*Random*
Mean	0.351011236	0.052861629
Variance	0.035070859	0.001403239
Observations	30	30
df	29	29
F	24.99278607	
P(F<=f) one-tail	7.34156E-14	
F Critical one-tail	1.860811435	

100 Shapes Complex t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.351011236	0.052861629
Variance	0.035070859	0.001403239
Observations	30	30
Hypothesized Mean Difference	0	
df	31	
t Stat	8.550718038	
P(T<=t) one-tail	5.85765E-10	
t Critical one-tail	1.695518783	
P(T<=t) two-tail	1.17153E-09	
t Critical two-tail	2.039513446	

Reject null hypothesis.
Conclude that EA is better than random search.