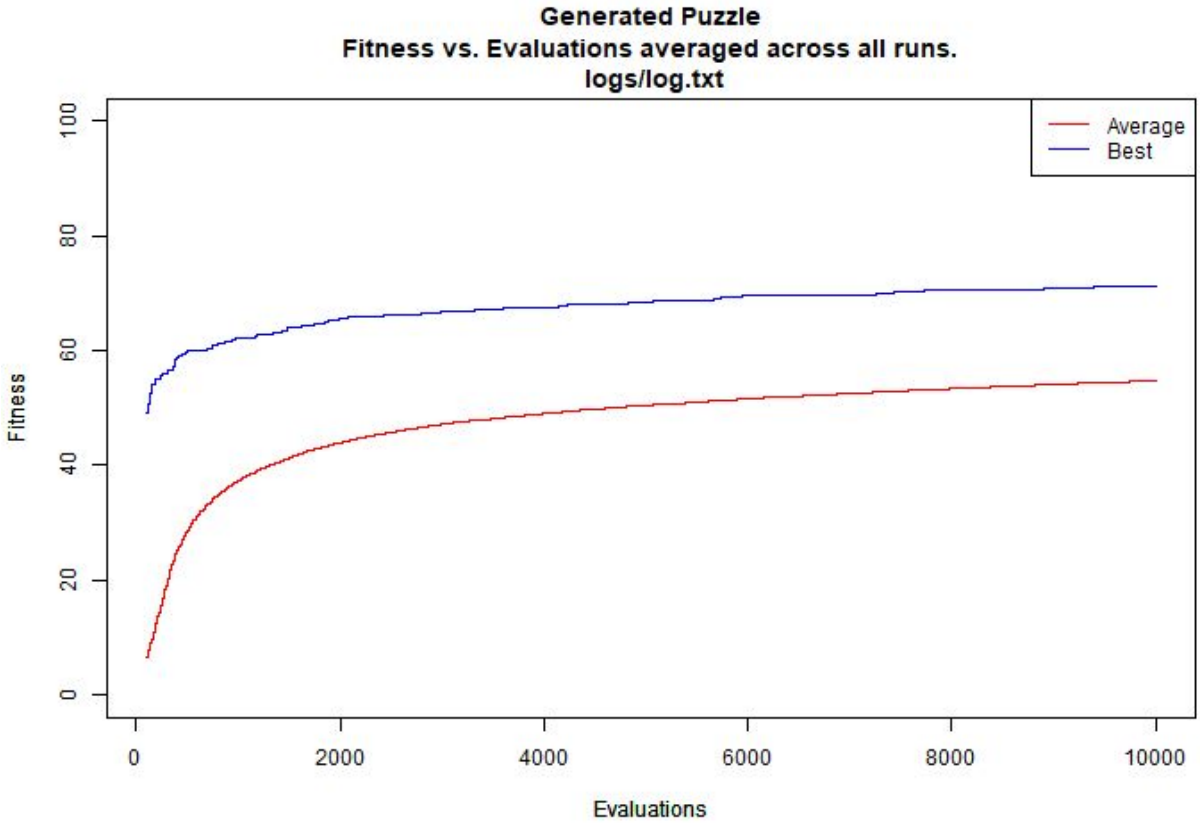
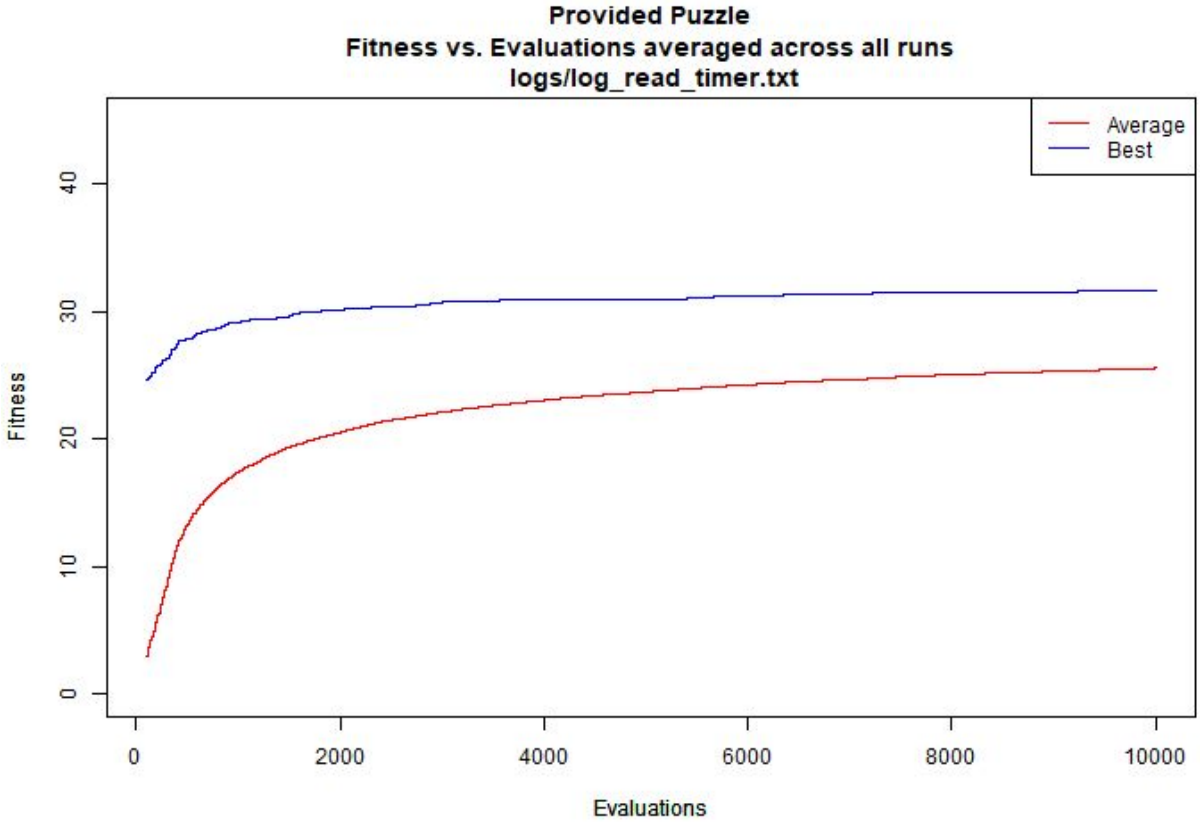
Tanner Wendland trwt33@mst.edu CS5401 FS2018 Assignment 1b





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Statistical Analysis : Using randomly generated puzzle for analysis

Best Local Solutions for all runs		
	Random Search	Basic Genetic Algorithm
Mean	69.2	71.2
Standard Deviation	3.61	2.89

F-test from R:

```
data:  unlist(one_a_local_best[1]) and unlist(one_b_local_best[1])
F = 1.5645, num df = 29, denom df = 29, p-value = 0.2341
alternative hypothesis: true ratio of variances is not equal to 1
95 percent confidence interval:
 0.7446588 3.2870605
sample estimates:
ratio of variances
         1.564525
```

Since 1.5645 > 0.2341
We fail to reject the Null hypothesis, so that variances are not equal.

T test results from R

```
data:  unlist(one_a_local_best[1]) and unlist(one_b_local_best[1])
t = -2.2853, df = 55.319, p-value = 0.02615
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -3.628527 -0.238140
sample estimates:
mean of x mean of y
 69.26667  71.20000
```

Since |-2.2853| > 0.02615 we reject the null hypothesis. So that true difference in means is not equal to zero.

So the algorithm that produces better results in the algorithm that produces the largest mean, that being the simple genetic algorithm.

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All statistical data can be found in the stats folder in the repository. All data was produced by R.