Tom Marquez and Elisha Waugh

[tmarquez@alaska.edu](mailto:tmarquez@alaska.edu), ebwaugh@alaska.edu

Evolutionary Computing

Project 2: Evolution Strategies

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | f(x) | seed | sigma | mu | lambda | comments |
| 7.6,7.6 | 33.16 | 5445 | .05 | 3 | 21 |  |
| 8.6,5.8 | 35.7 | 100 | .05 | 3 | 21 | The fitness improved |
| 9.6,4.7 | 35.8 | 2 | .05 | 3 | 21 | It improved any more |
| 7.6,4.8 | 33.5 | 10000 | .05 | 3 | 21 | The fitness decreased from the previous two runs |
| 8.1, 4.6 | 33.9 | 100000 | .05 | 3 | 21 | Increase from the previous, but still lower than seed 100 and seed 2 |
| 8.1, 4.7 | 34.3 | 100000 | .01 | 3 | 21 | Changed mu while leaving the other parameters the same. A slight increase in fitness |
| 7.1, 5.9 | 34.5 | 800 | .01 | 3 | 21 | Lower seed produced a higher fitness |
| -2.1, 4.1 | 27.7 | 2 | .01 | 3 | 21 | Lower seed produced a dramatically lower fitness |
| 8.1, 4.3 | 33.9 | 15 | .01 | 3 | 21 | A higher fitness than the previous run, but still relatively low |
| 11.6, 4.8 | 37.5 | 15 | .01 | .08 | 21 | This produced the highest fitness score |

Results:

We had difficulty understanding how sigma needed to change as the program progressed. What we did notice, thought, is as we lowered the value of sigma, the variance between the parents after mutation begin to shrink the further along the program ran. It seems as though we would obviously get different results if mu changed as the program progressed.

The best result we had seemed to yield from a seed of 15 and mu of .01.