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*Genetic Algorithm – Mission Moon*

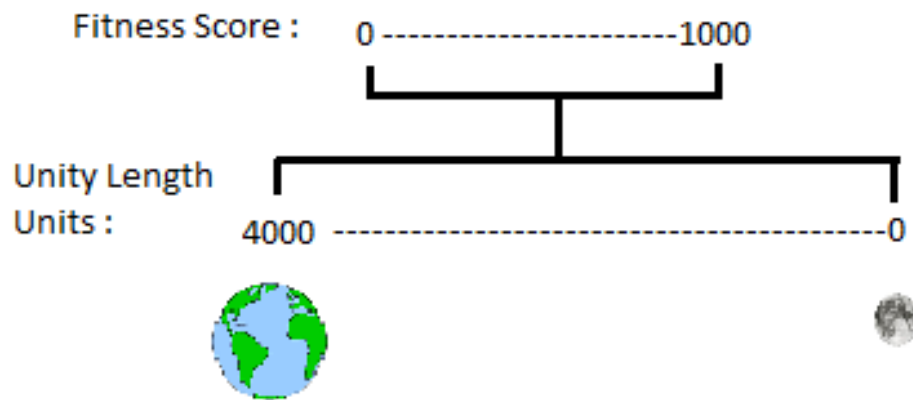
*Results Report*

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## Fitness Function 1:

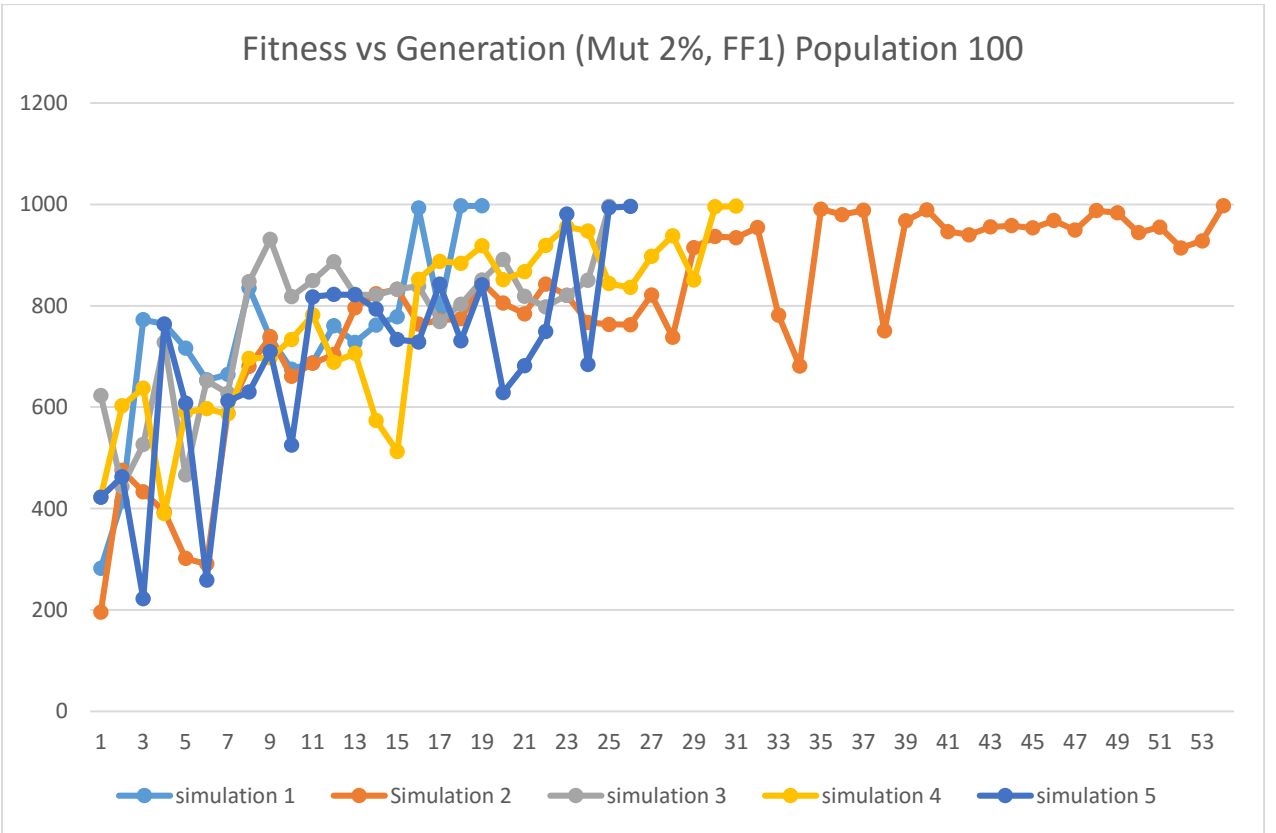
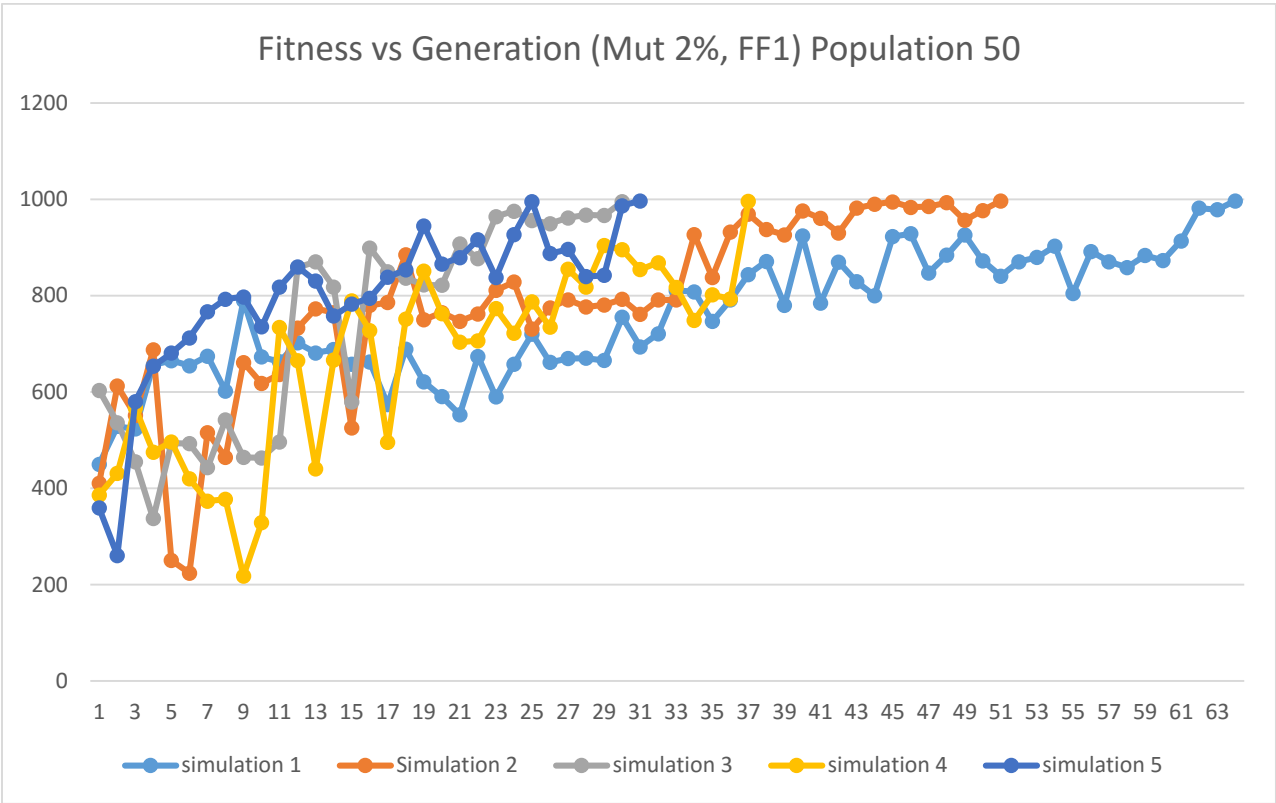
FF1 considers Minimum distance from moon ever recorded in a satellites journey time.

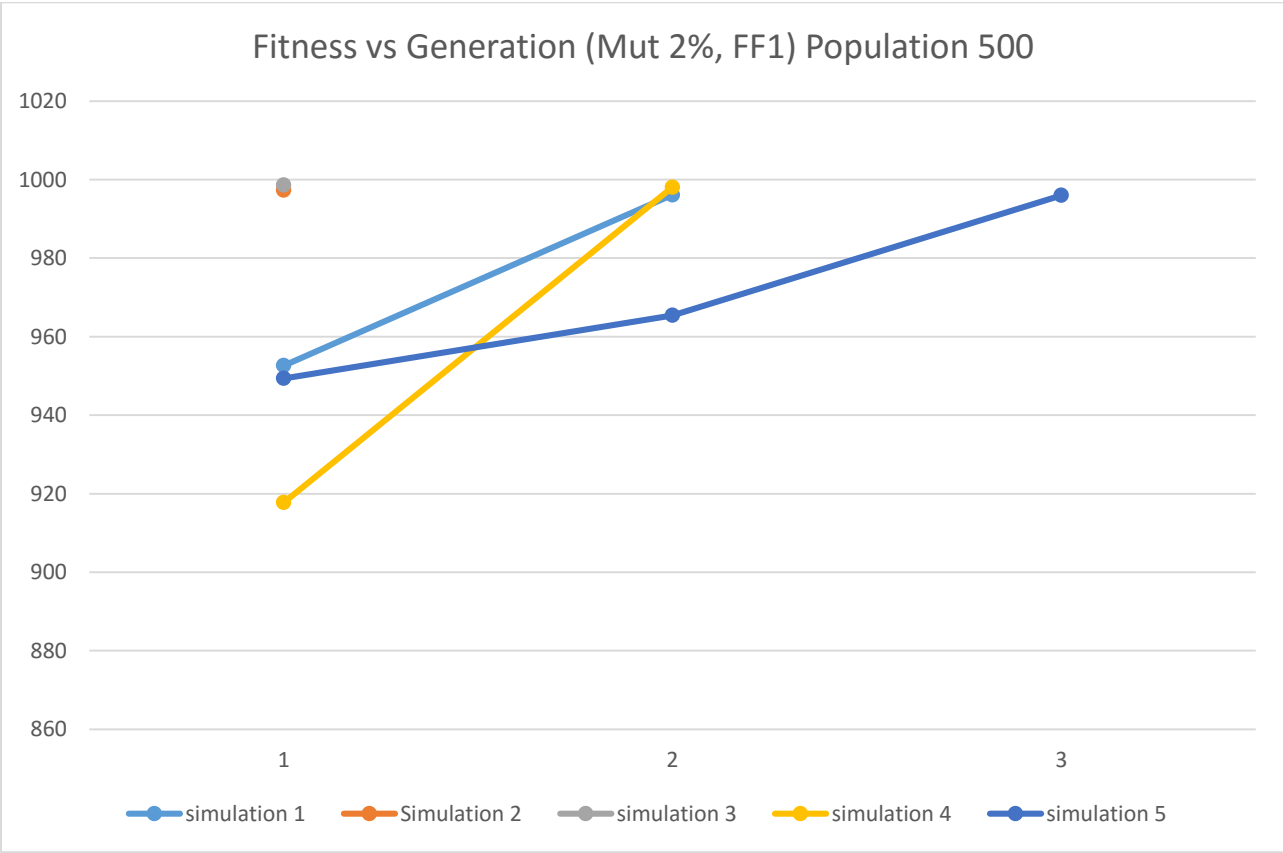
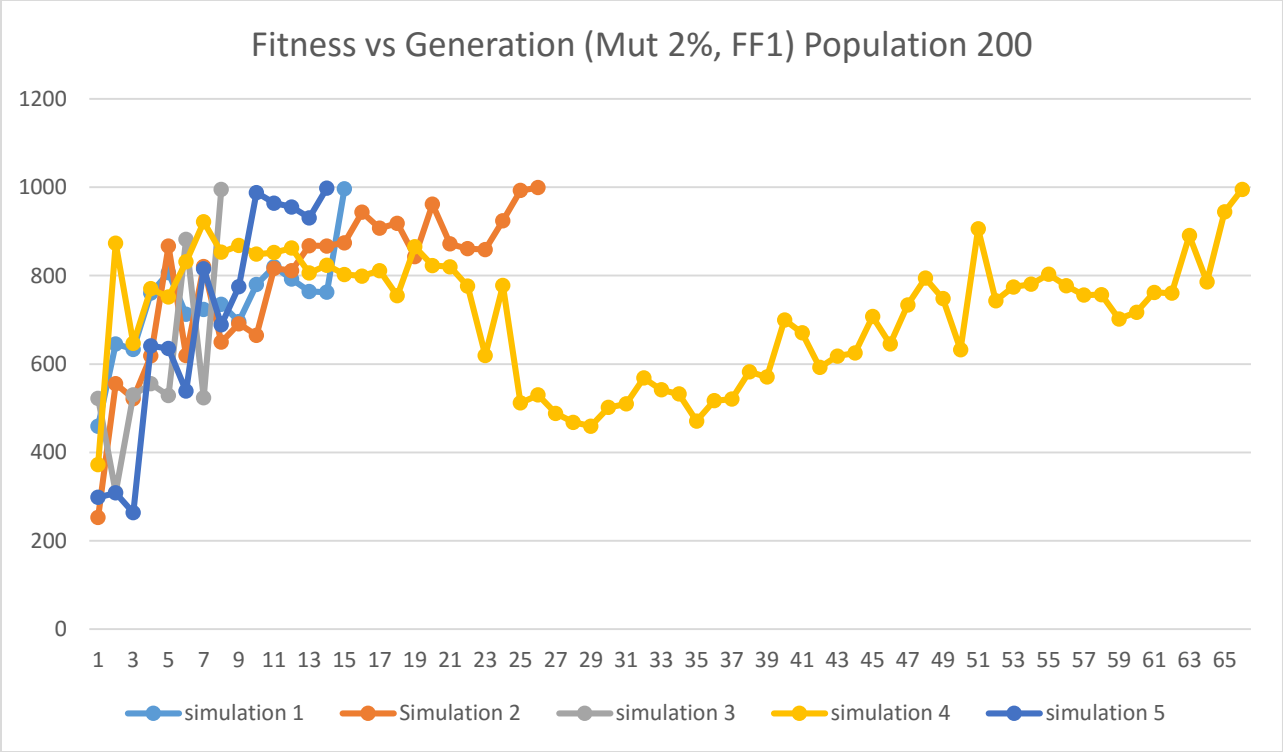
It is mapped between in the following way:



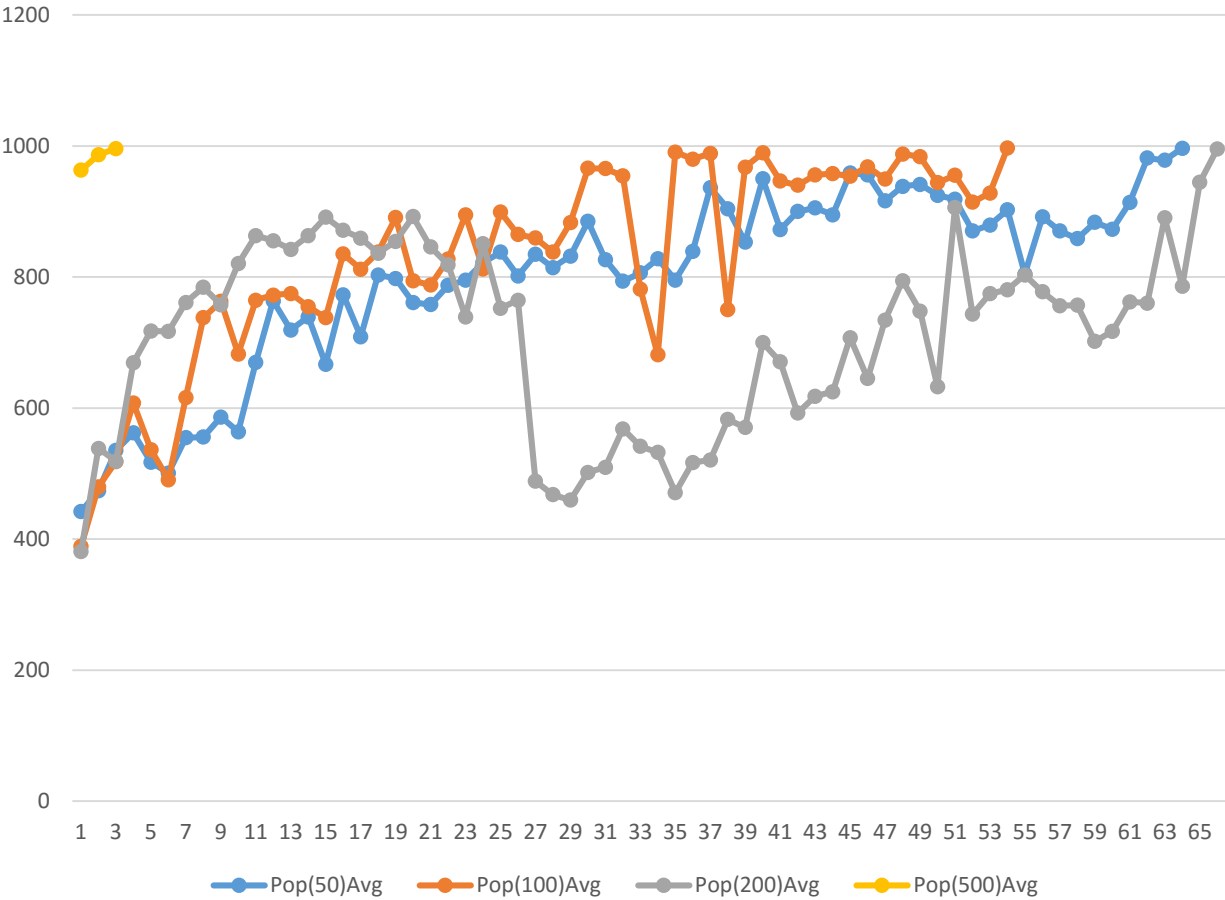
$$F(x) = 1000 - (x/4);$$

Results when mutation is set to 2% :

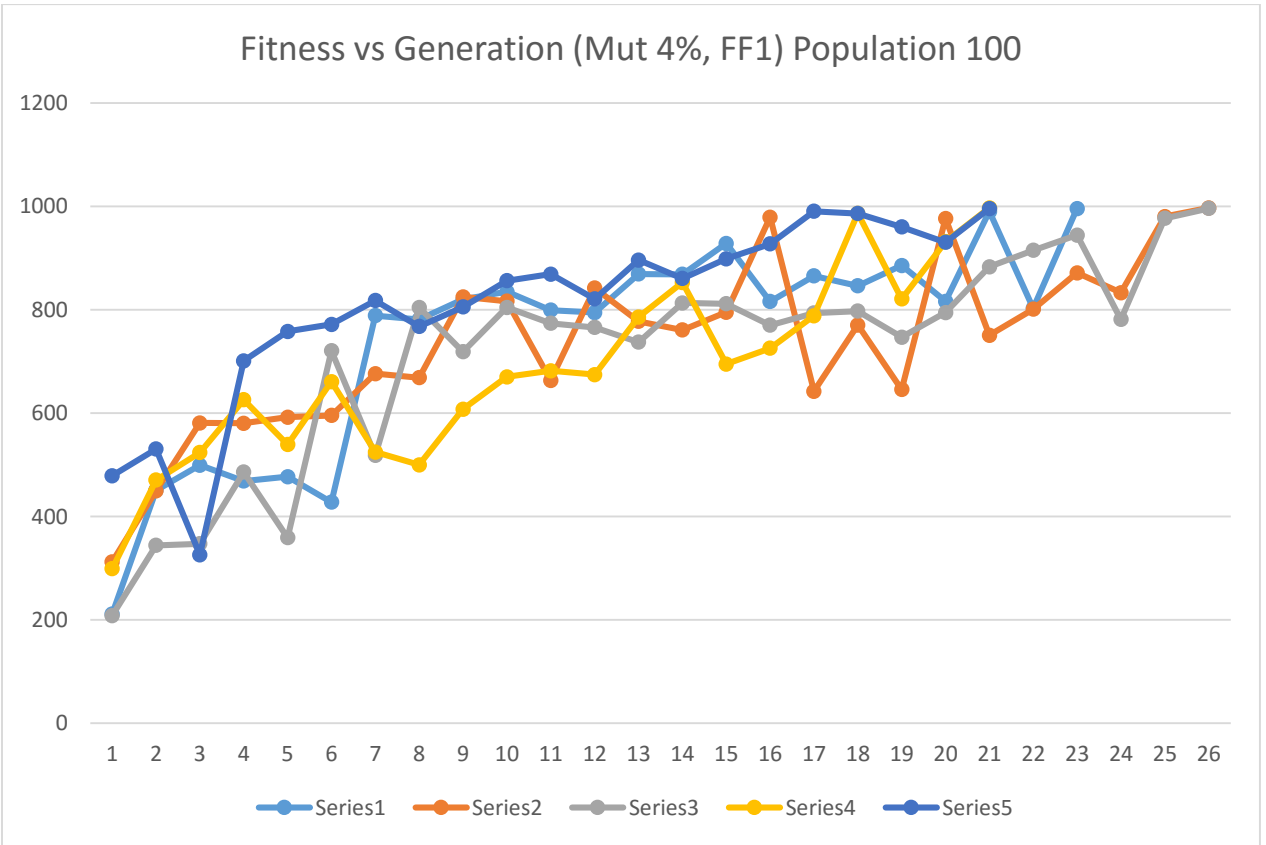
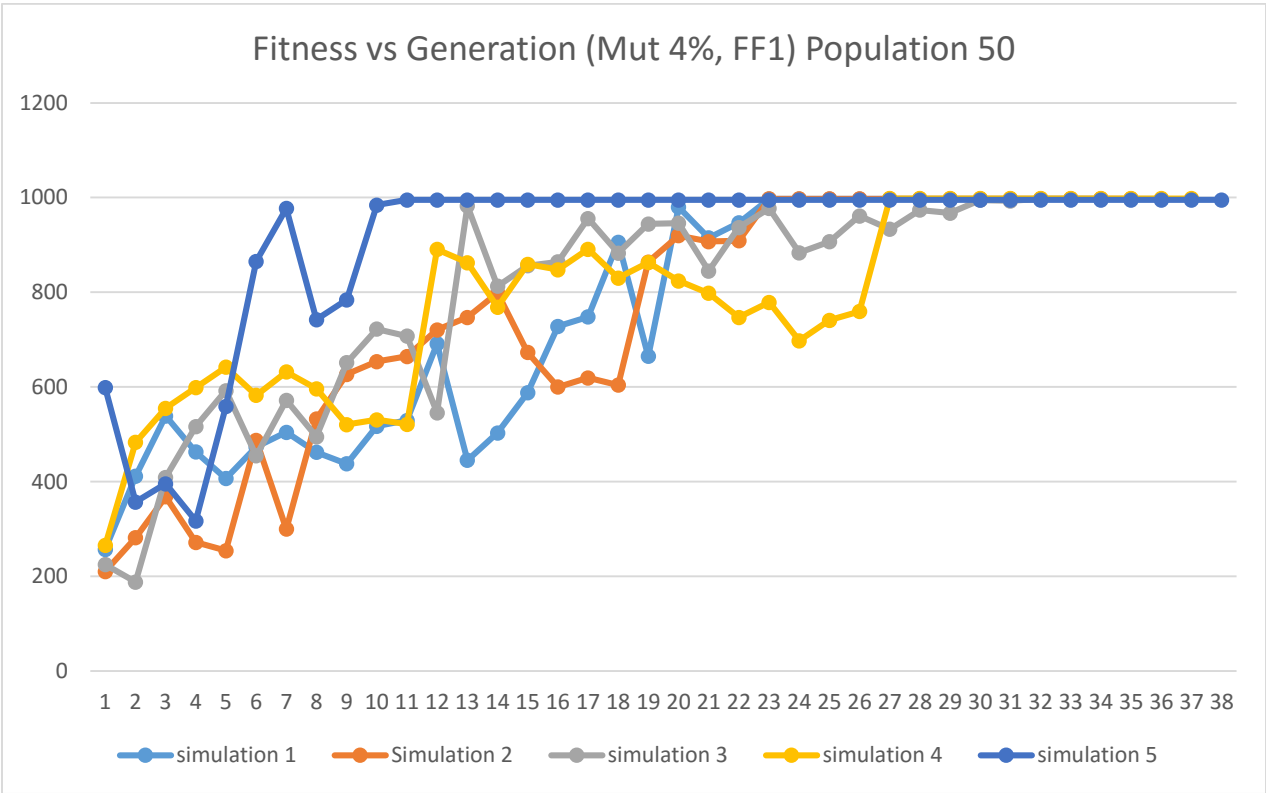


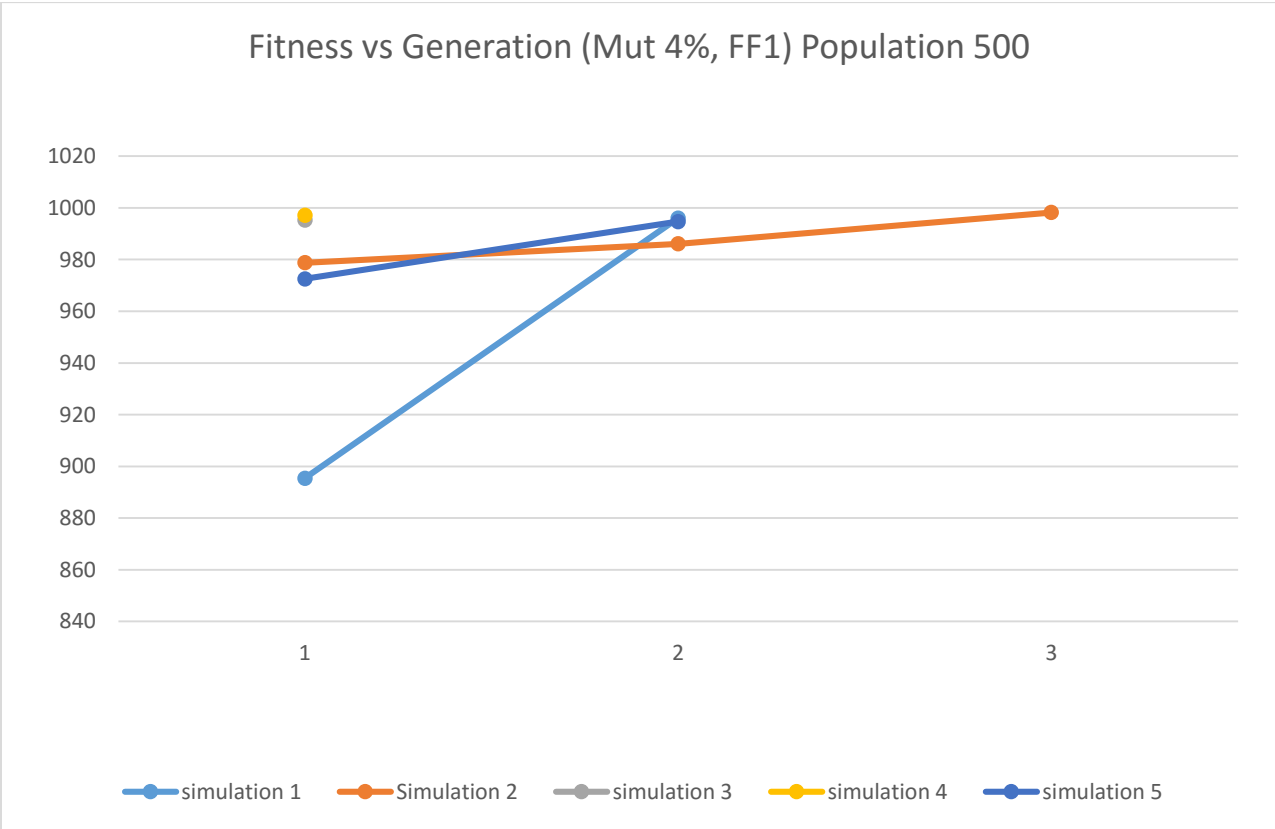
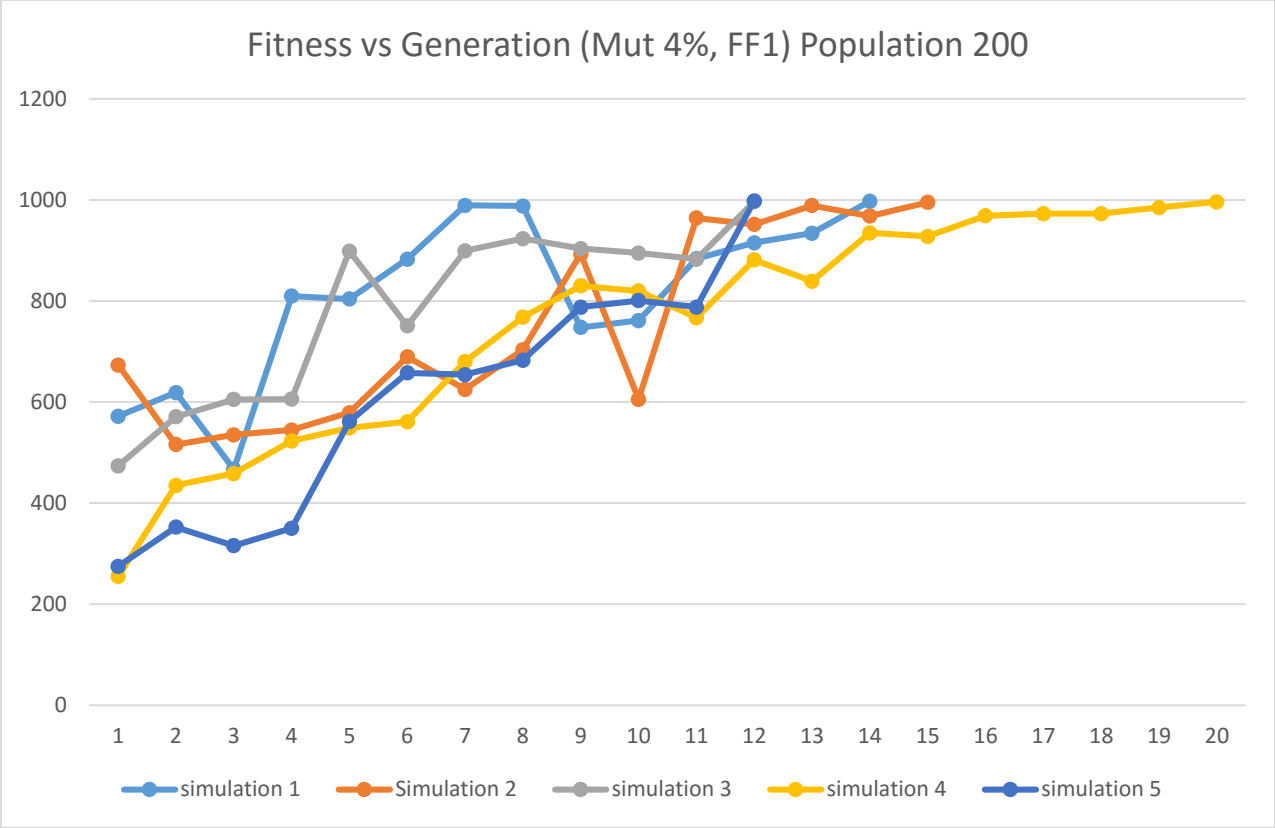


Fitness vs Gen(Mutation 2%, FF1)

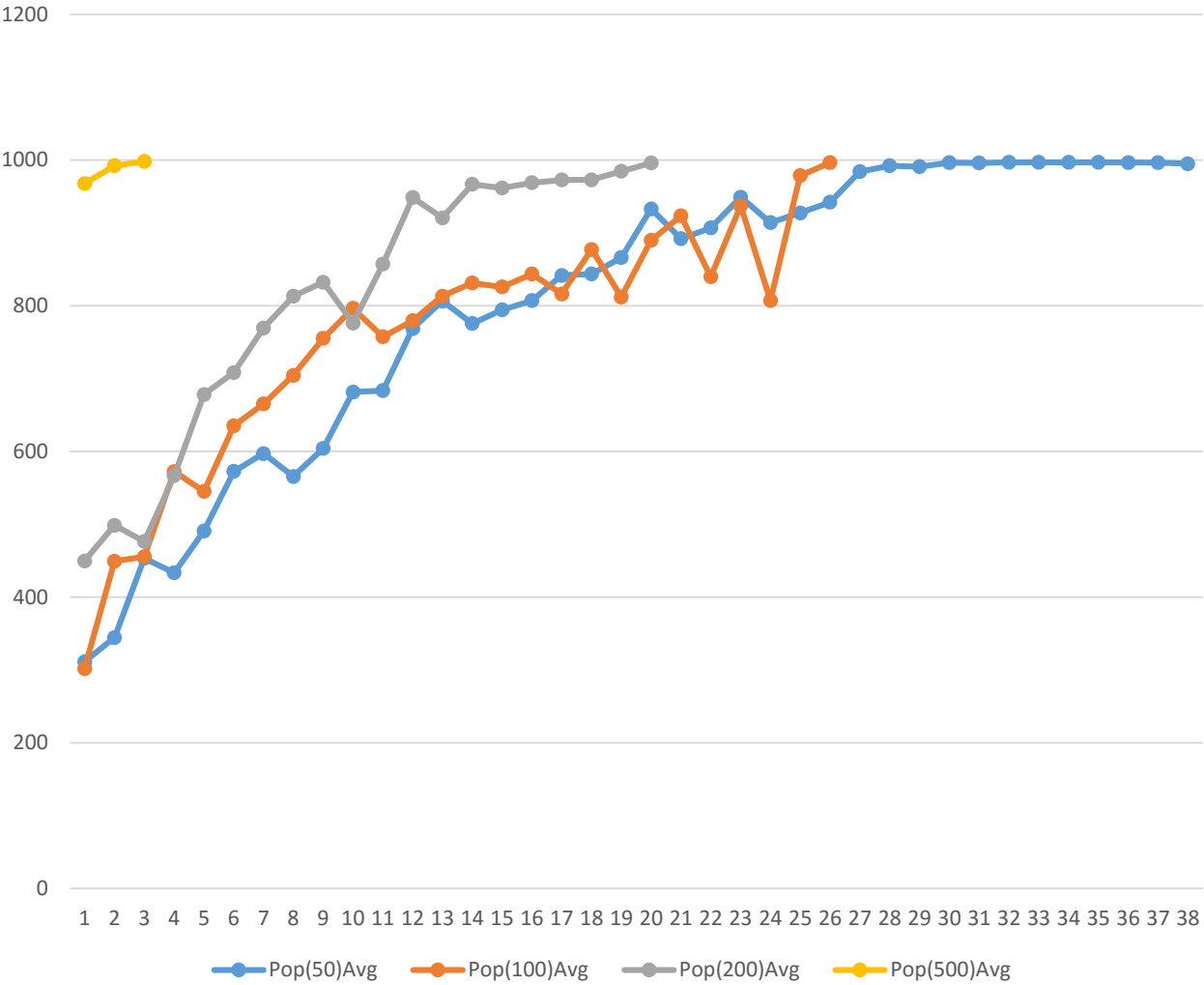


Results when Mutation rate is 4%:



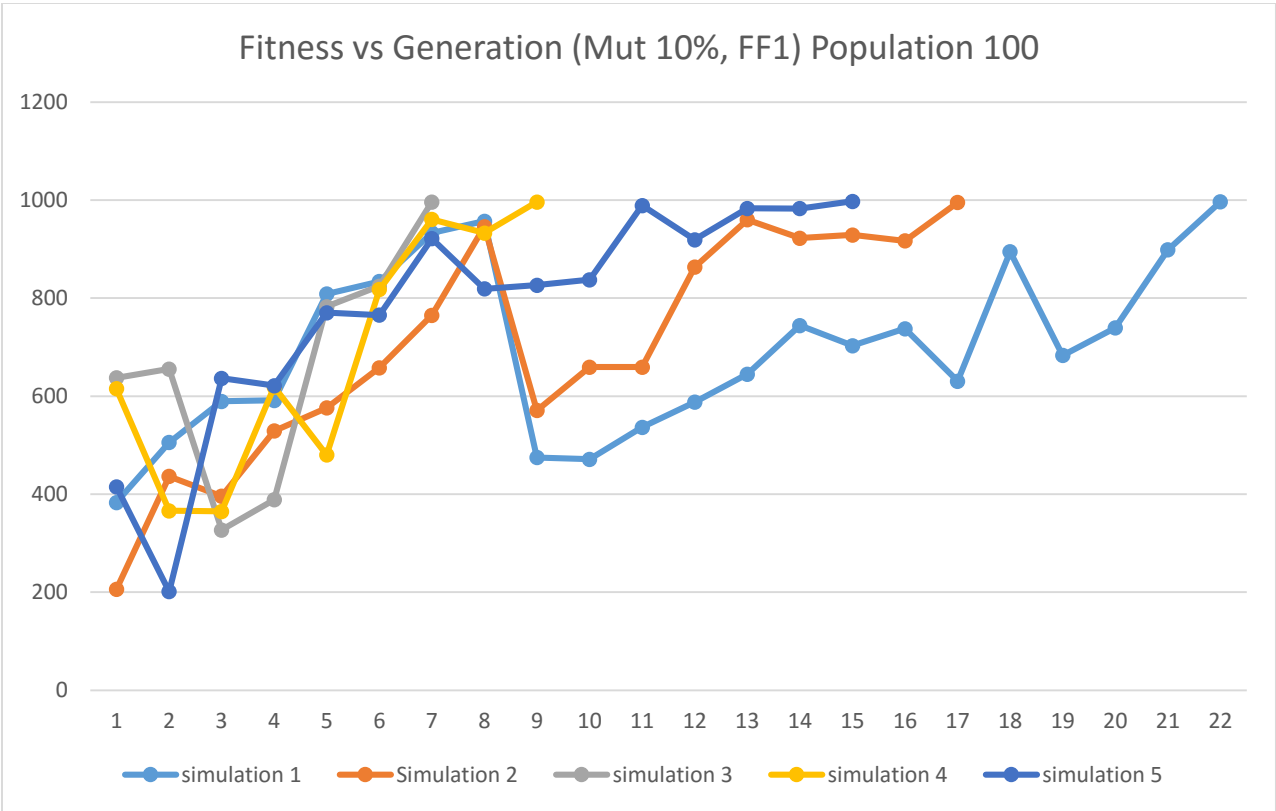
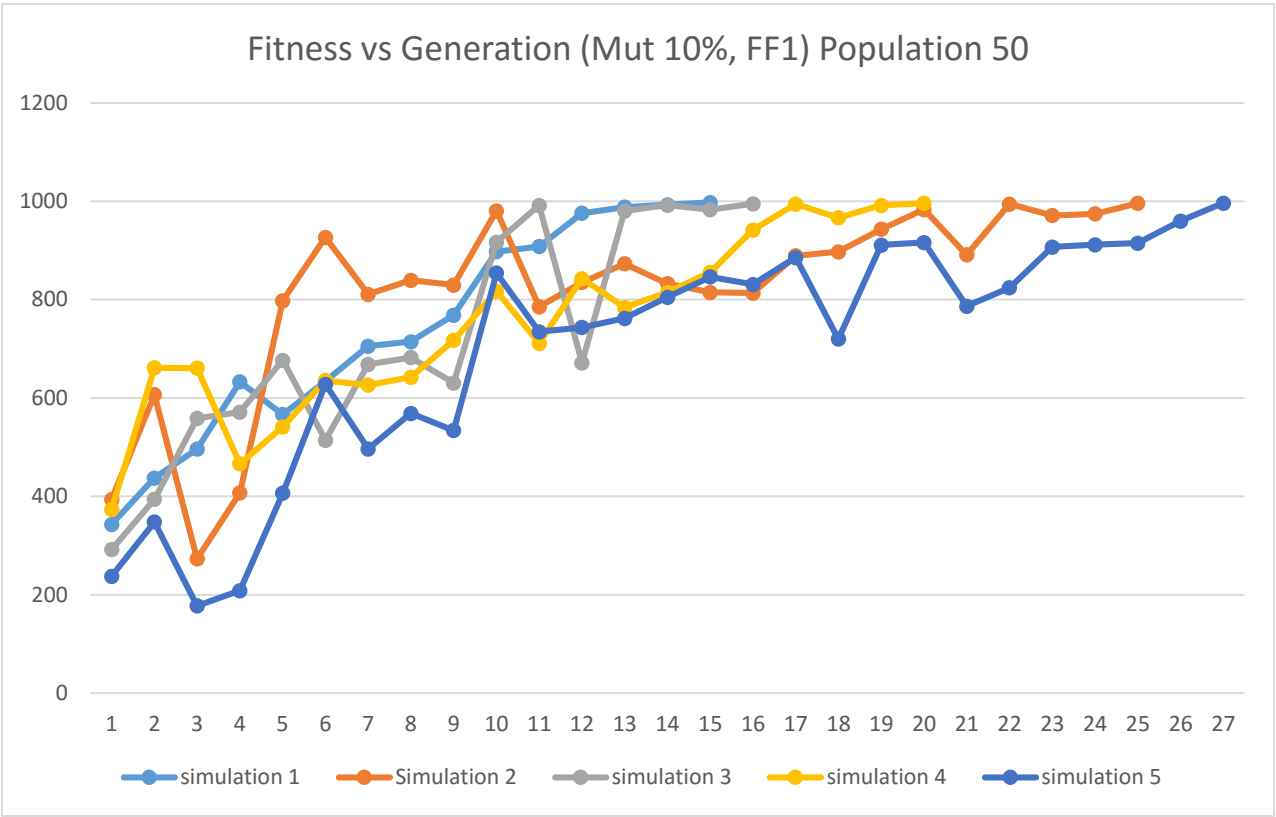


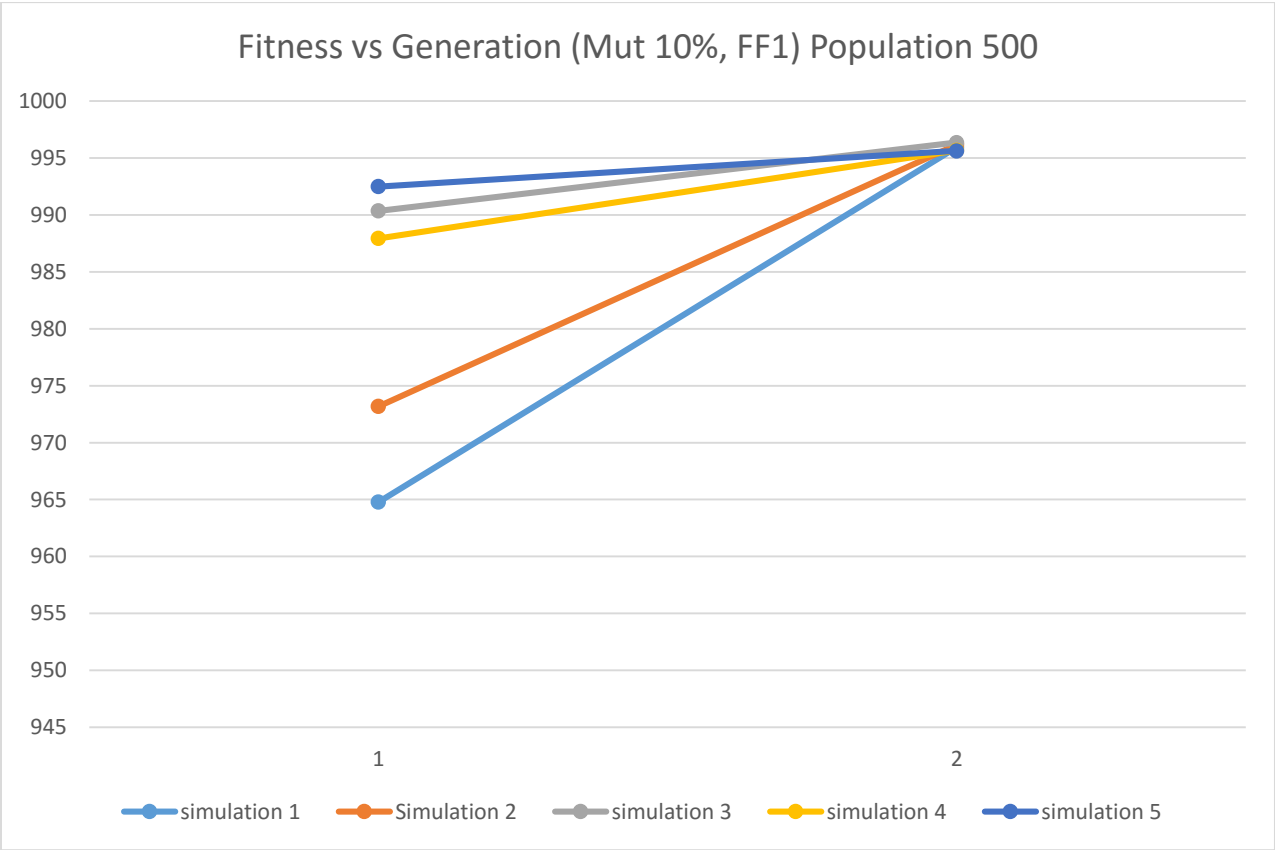
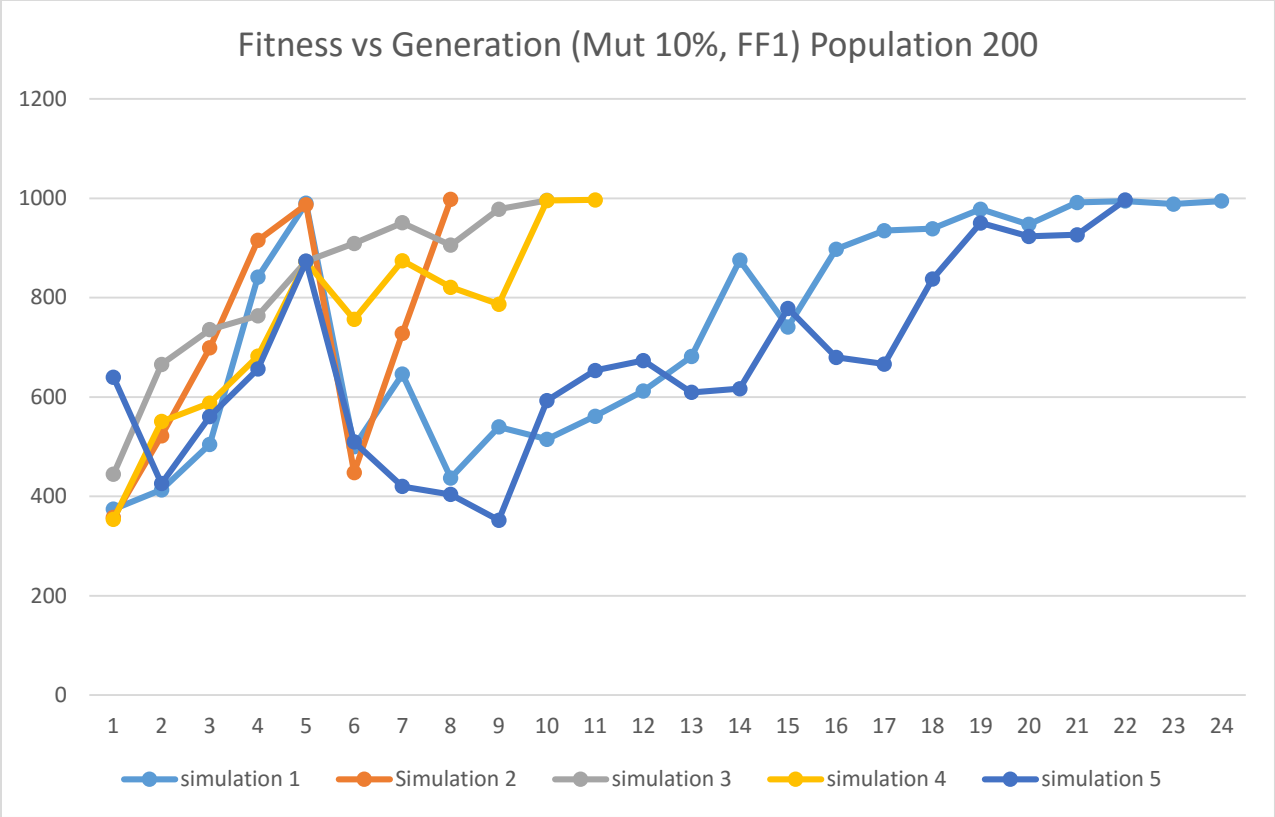
Fitness vs Gen (Mutation 4%, FF1)



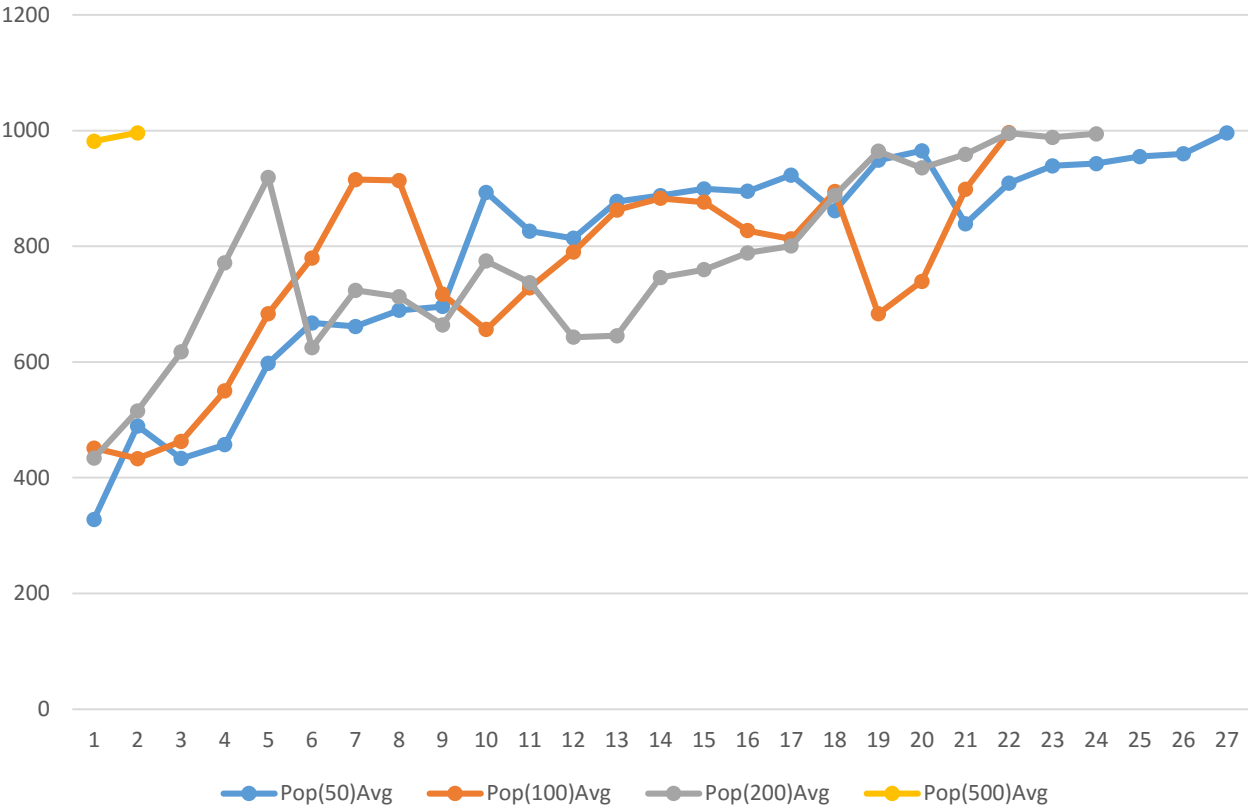


Results when Mutation rate is 10%:

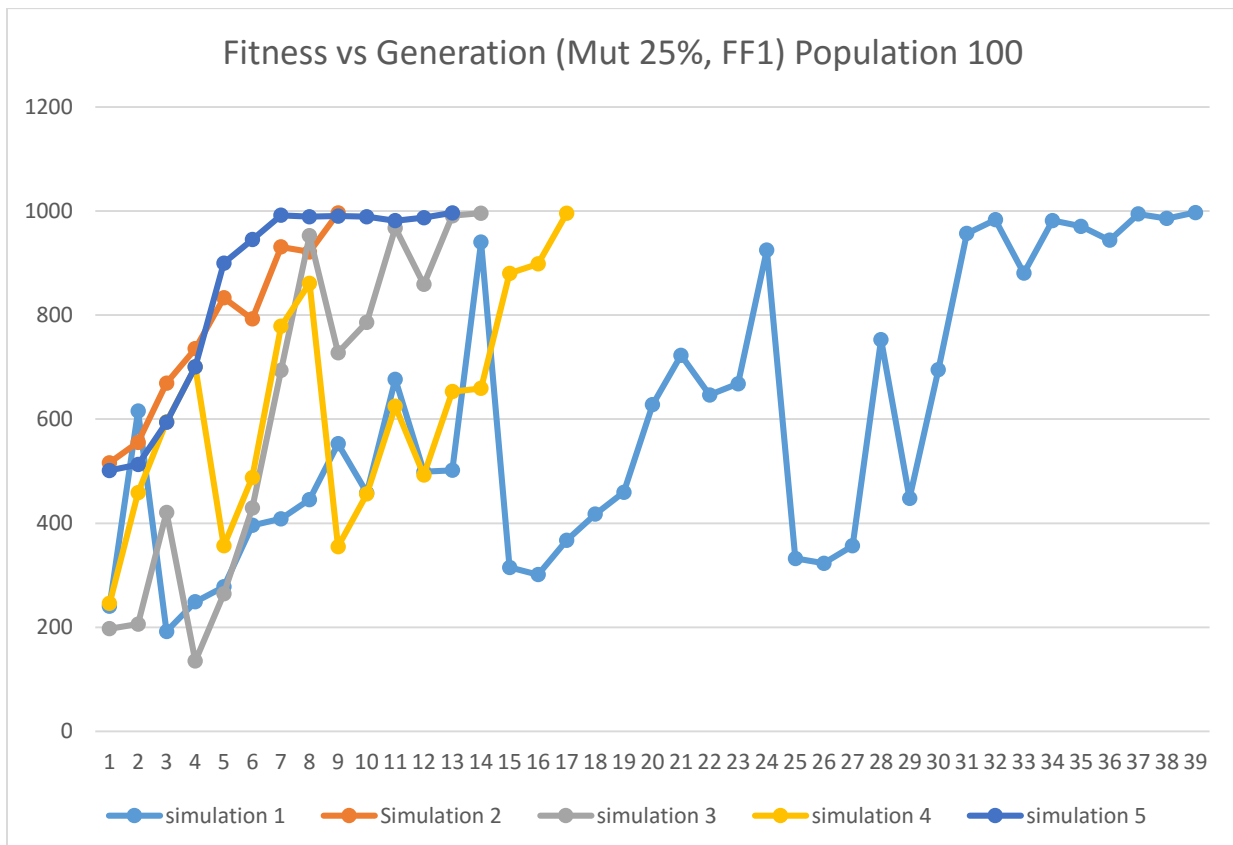
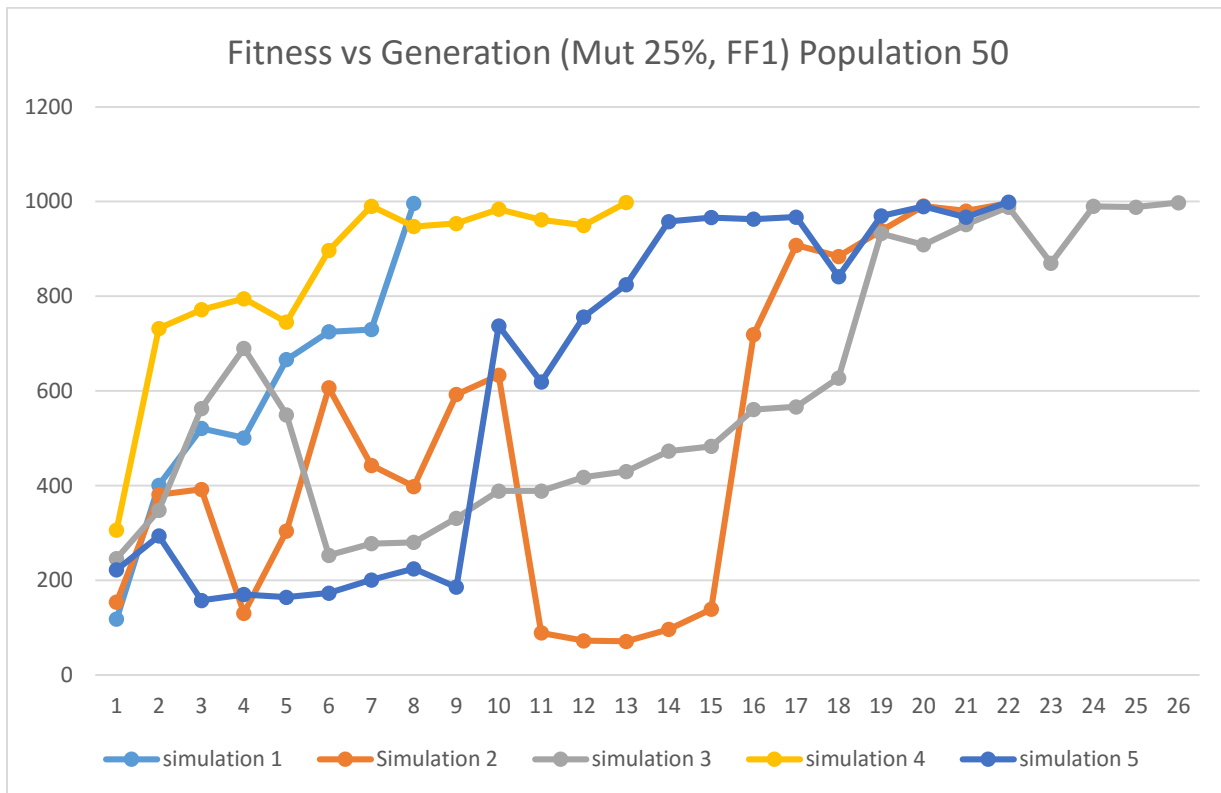


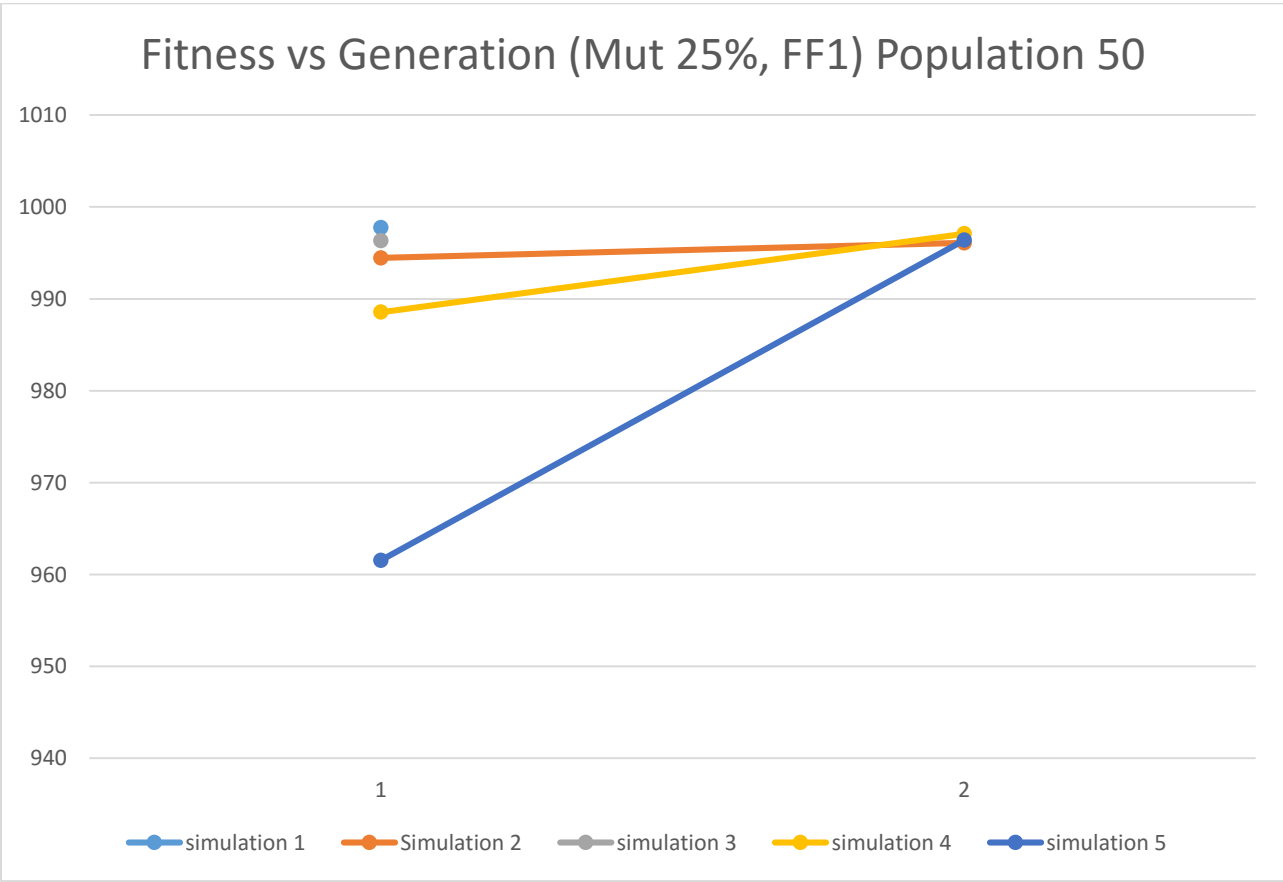
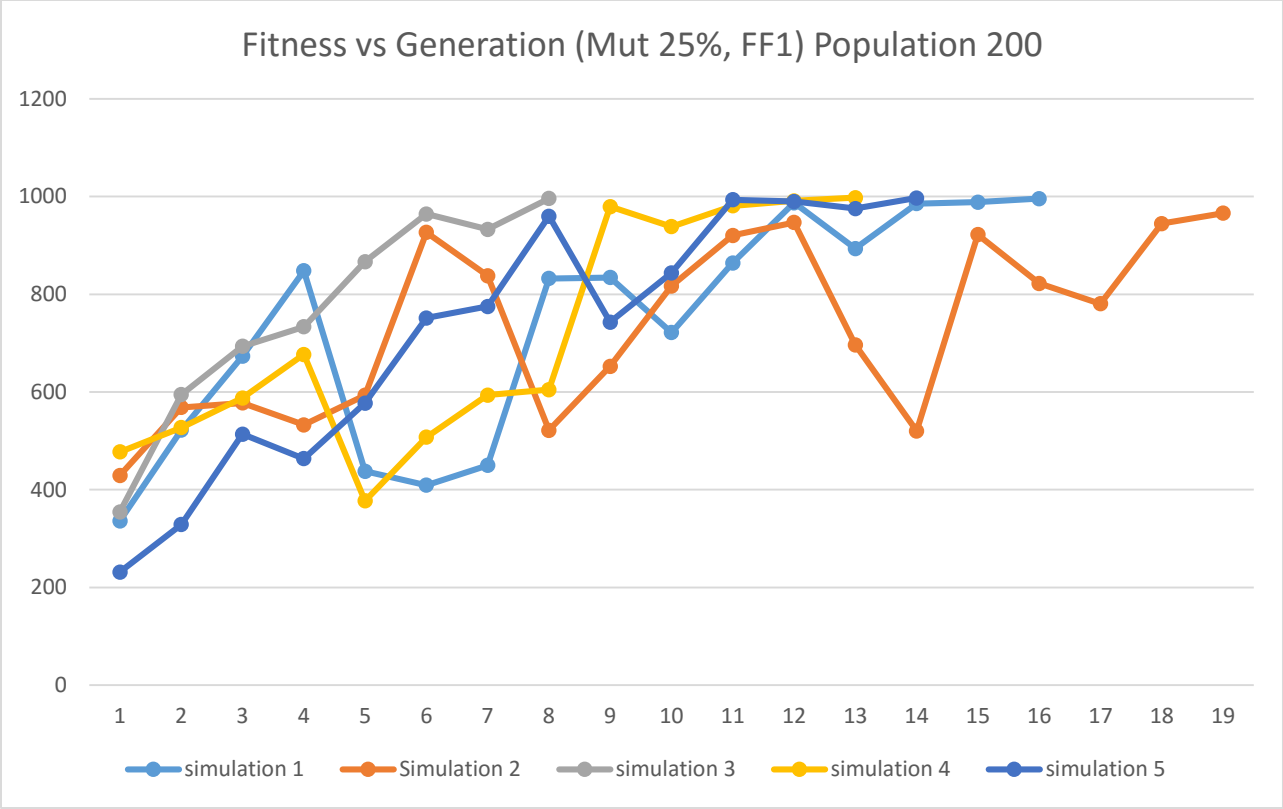


Fitness vs Gen (Mutation 10%,FF1)

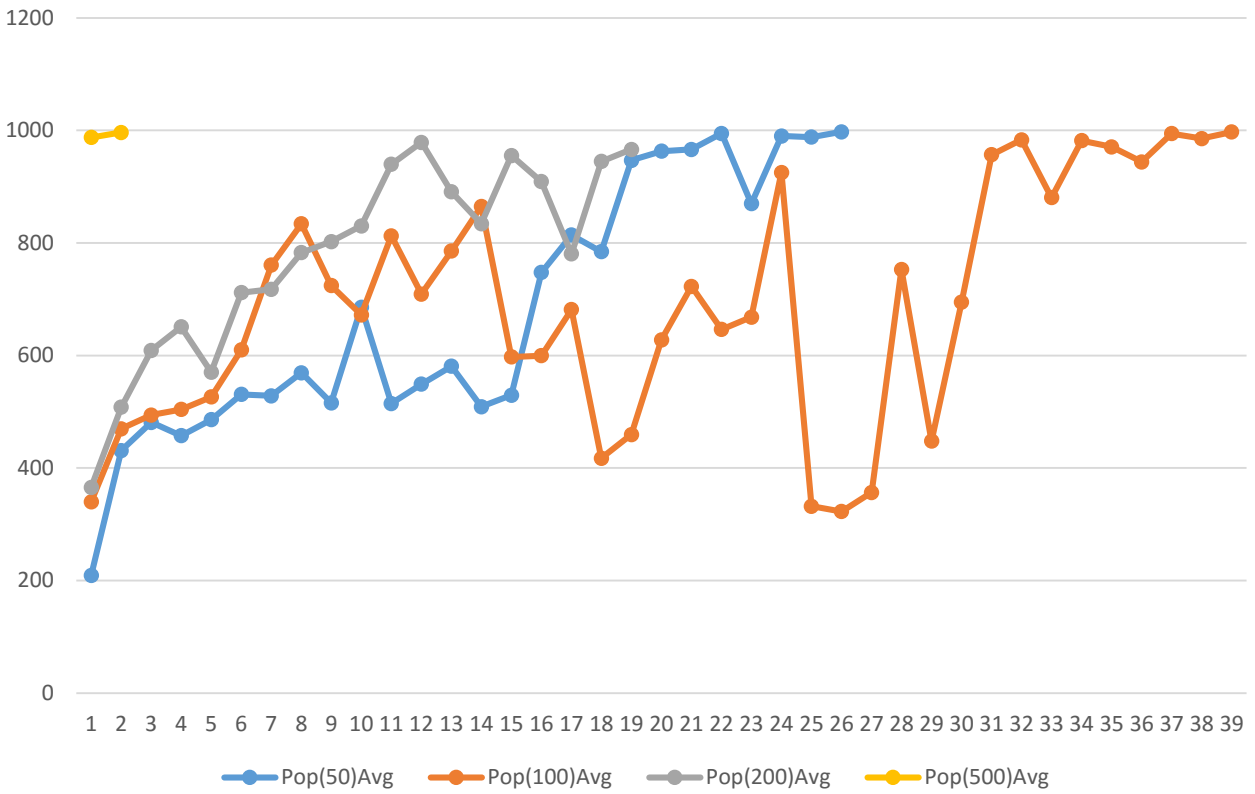


Results when Mutation Rate is 25;

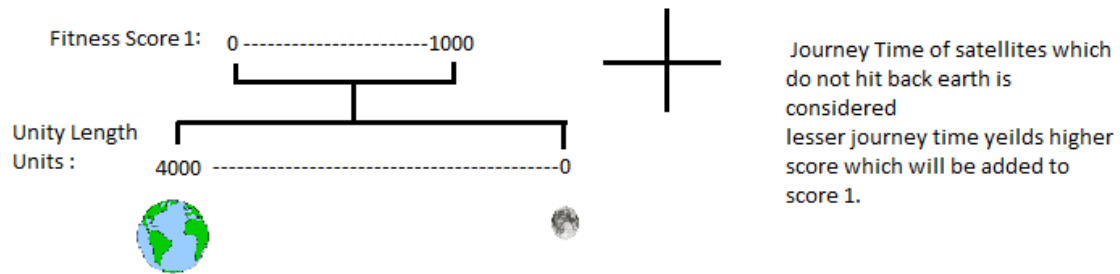




Fitness vs Gen (Mutation 25%,FF1)



## Fitness Function 2:

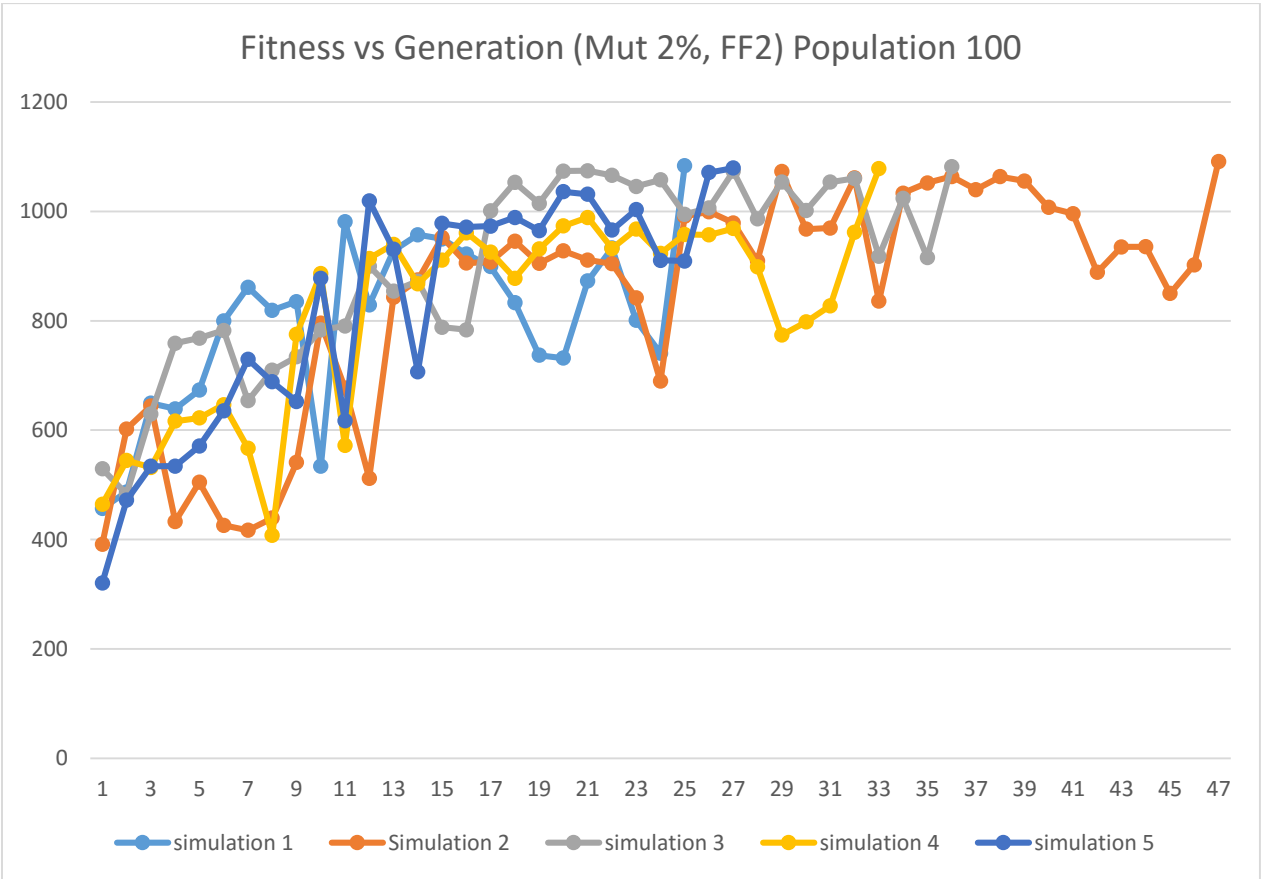
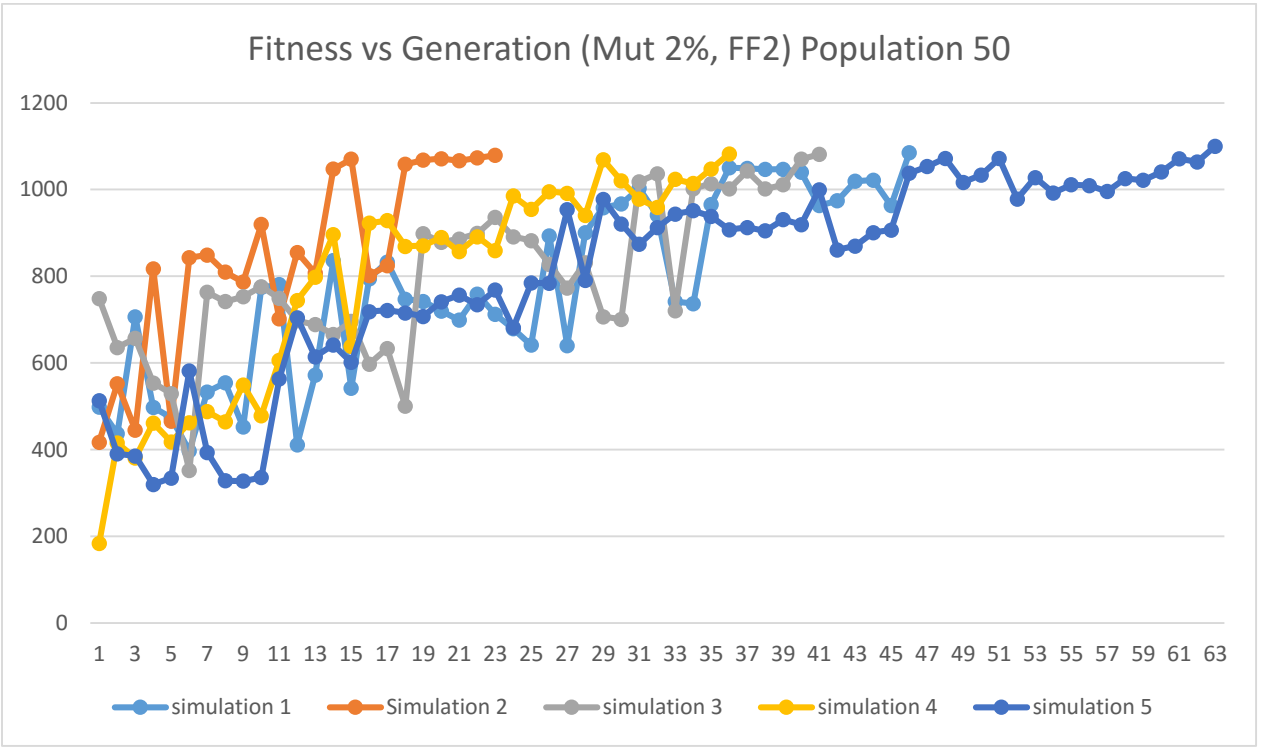


```
// fitness for dist + Journey time
float d = 1000 - (minimumDistanceFromMoon / 4);

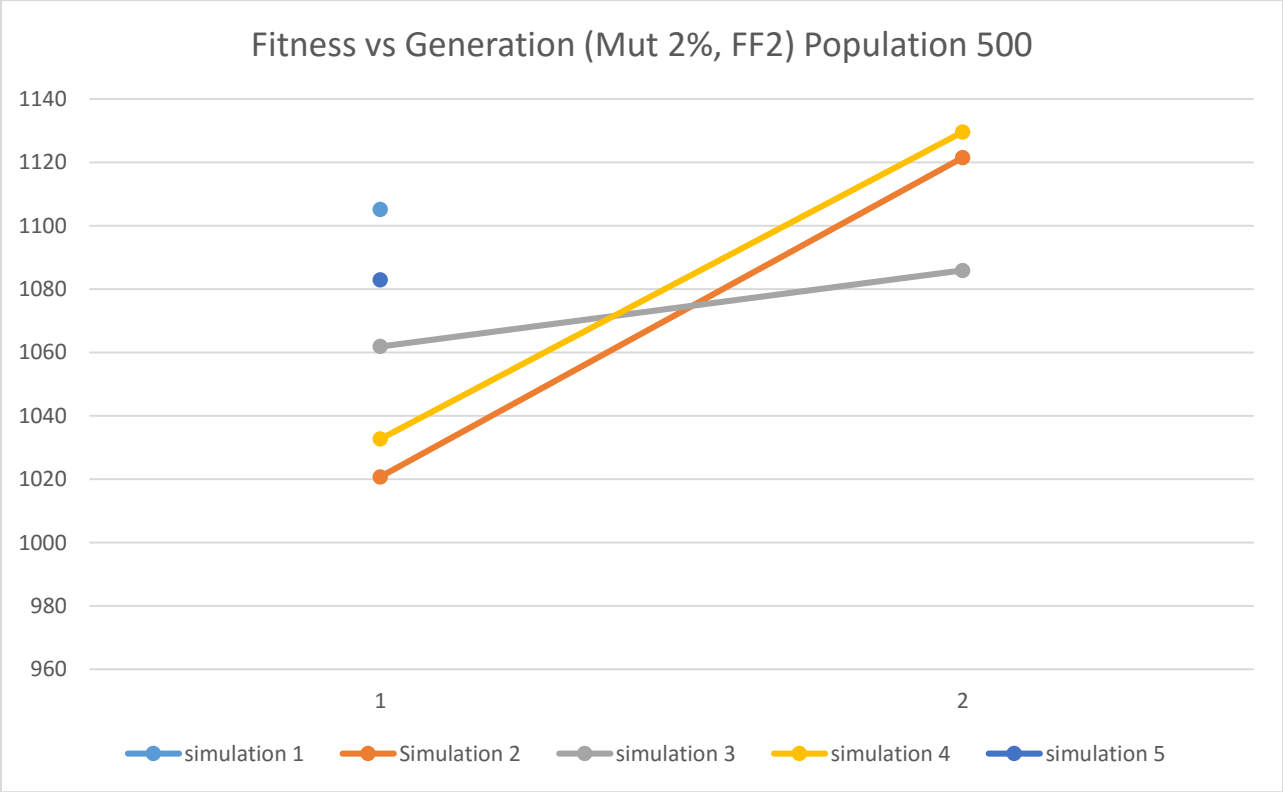
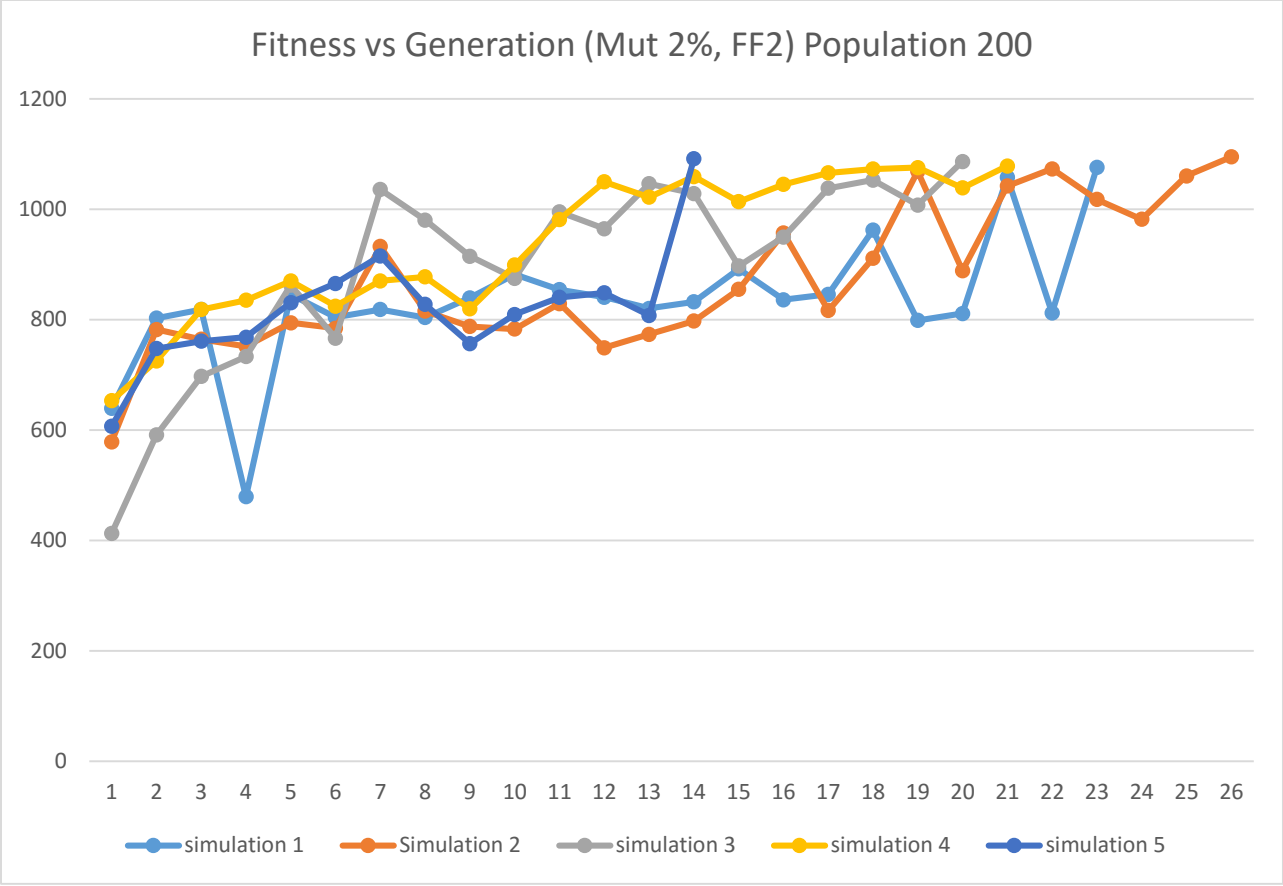
float t = 0;
// if not colideed to Earth
if (TargetCollided != 1)
{
    t = (100 + (JourneyTime * (-10 / 3))) * (rate/10);
}

d += t;
this.fitness = d;
```

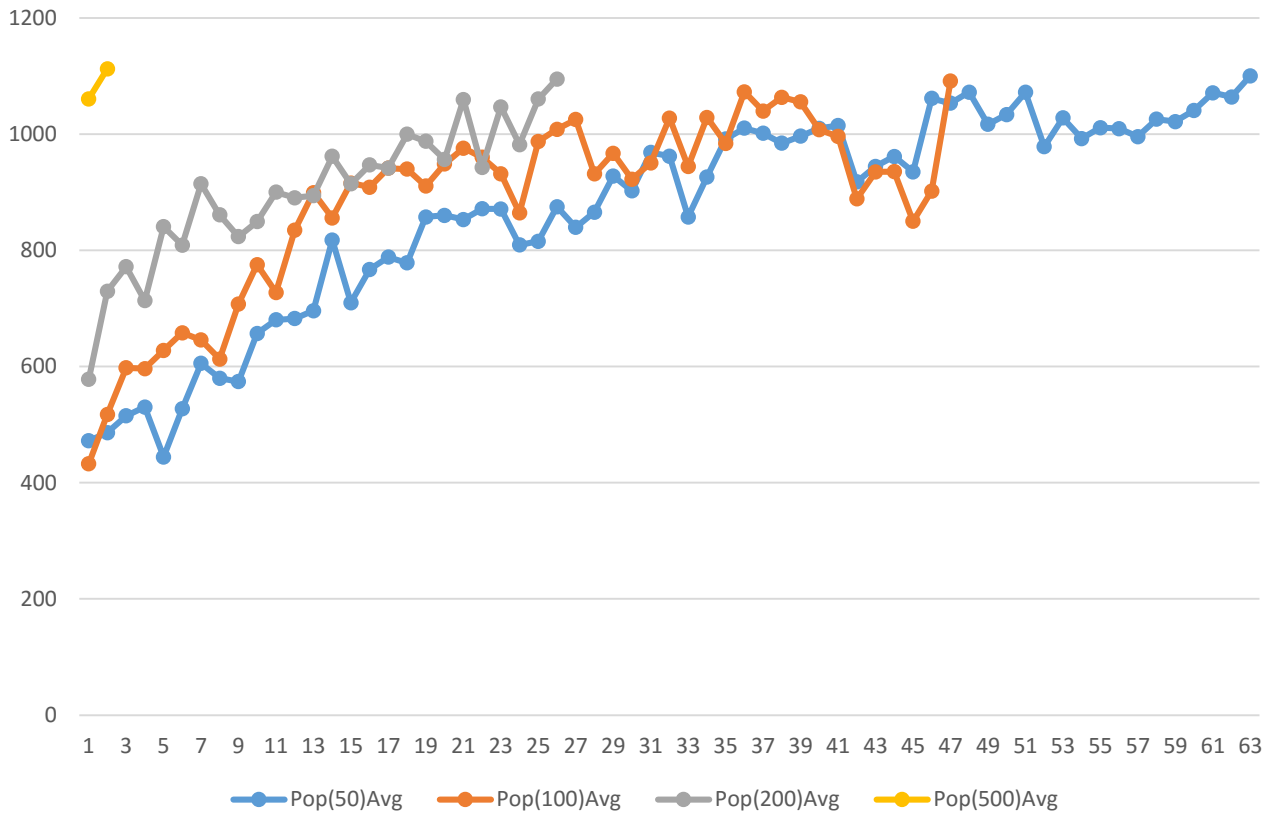
Results when Mutation Rate is 2%:



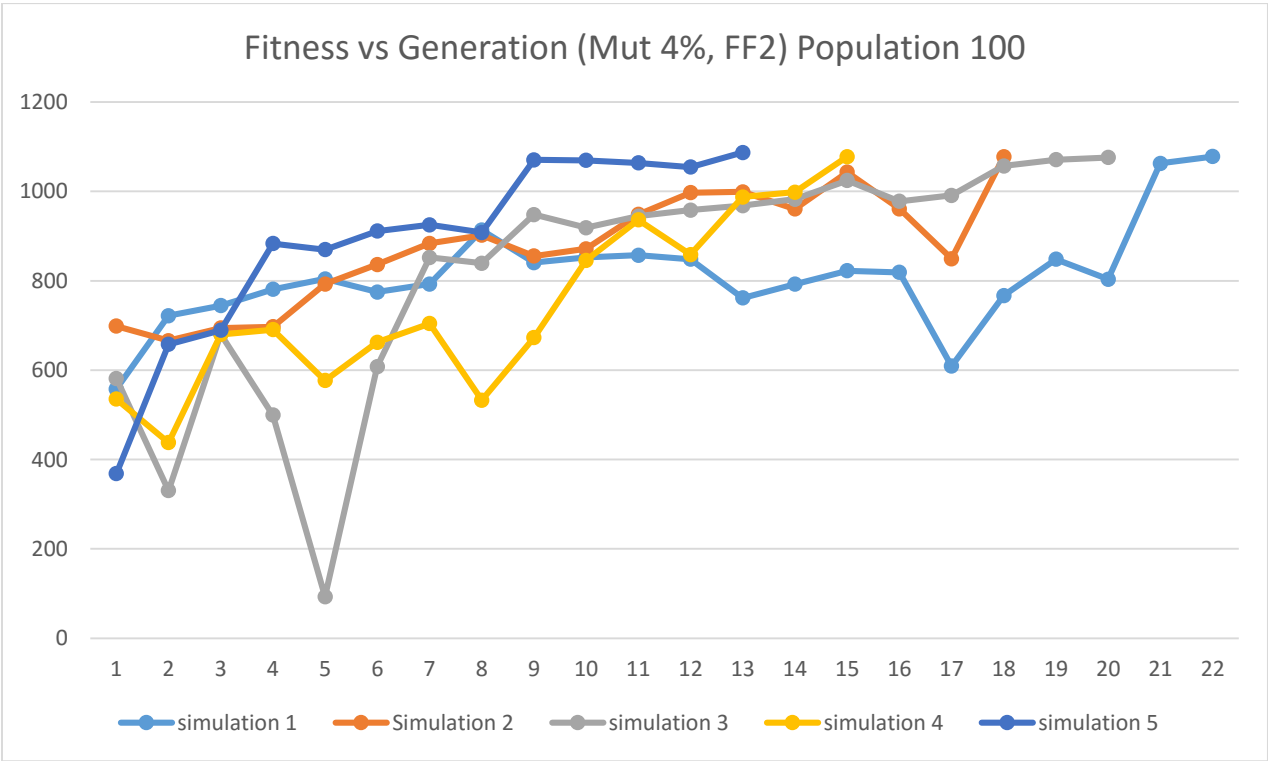
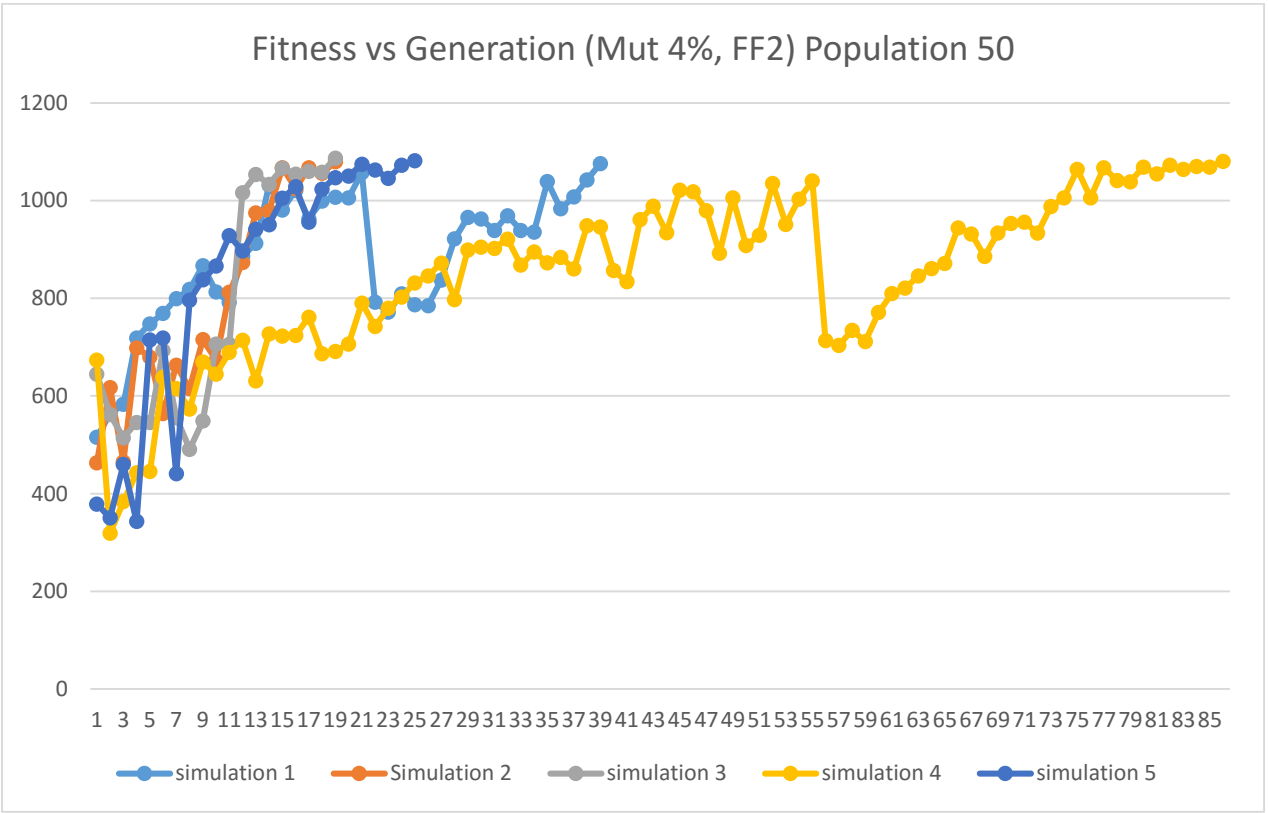


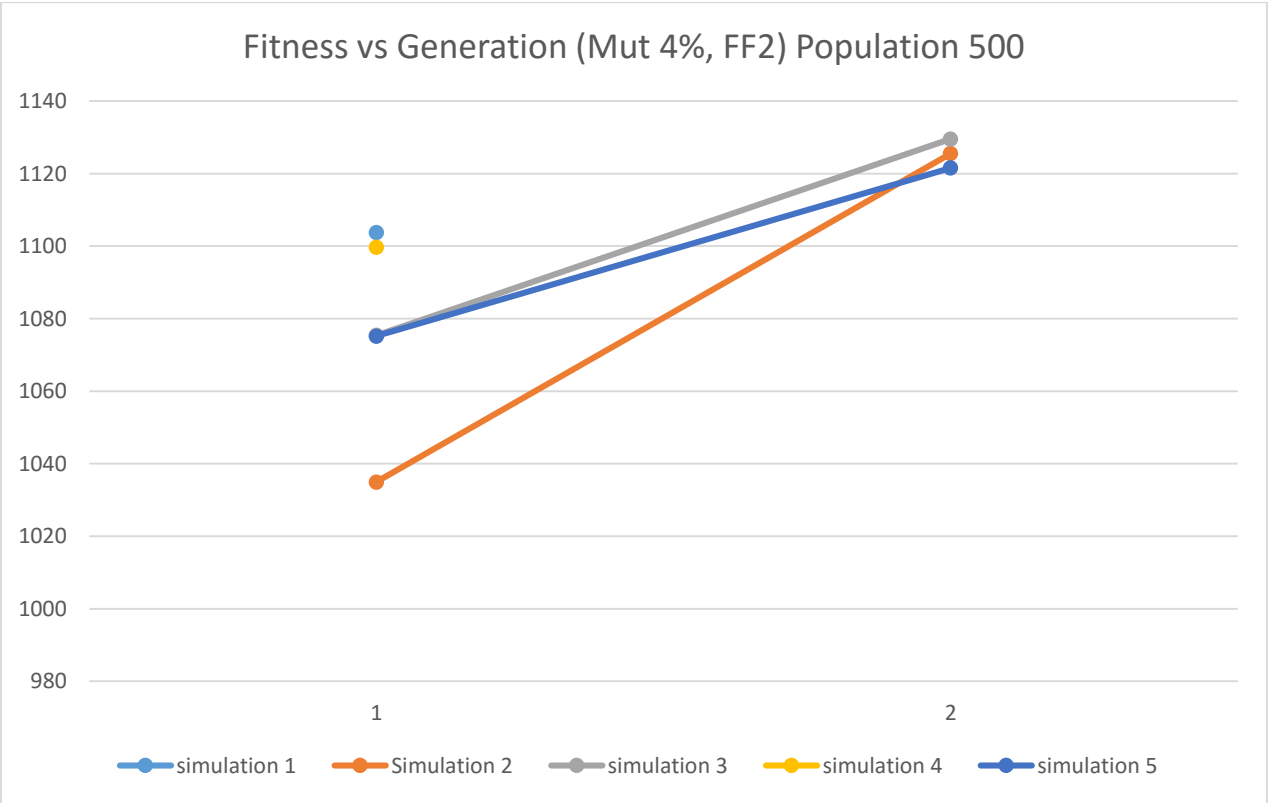
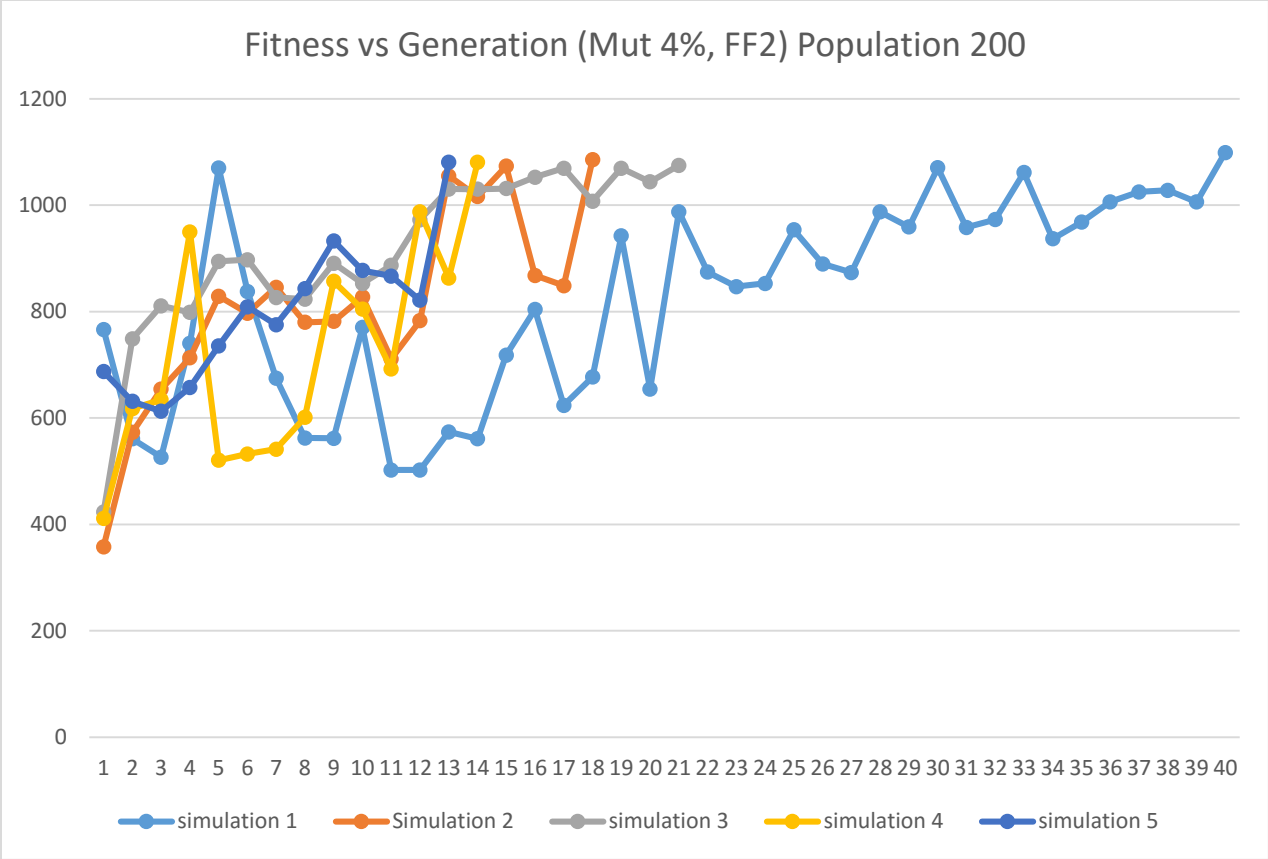


Fitness vs Gen (Mutation 2%,FF2)

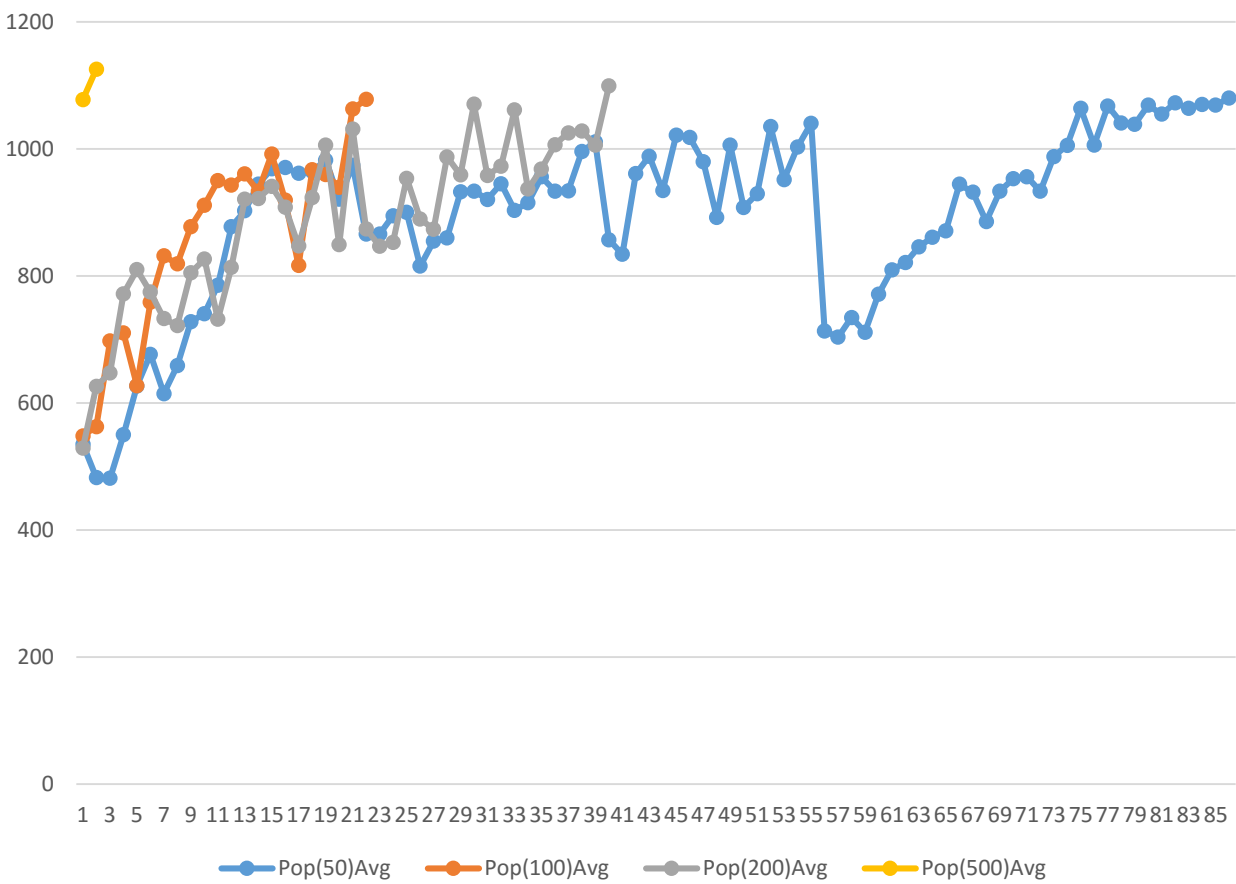


Results when Mutation Rate is 4%:

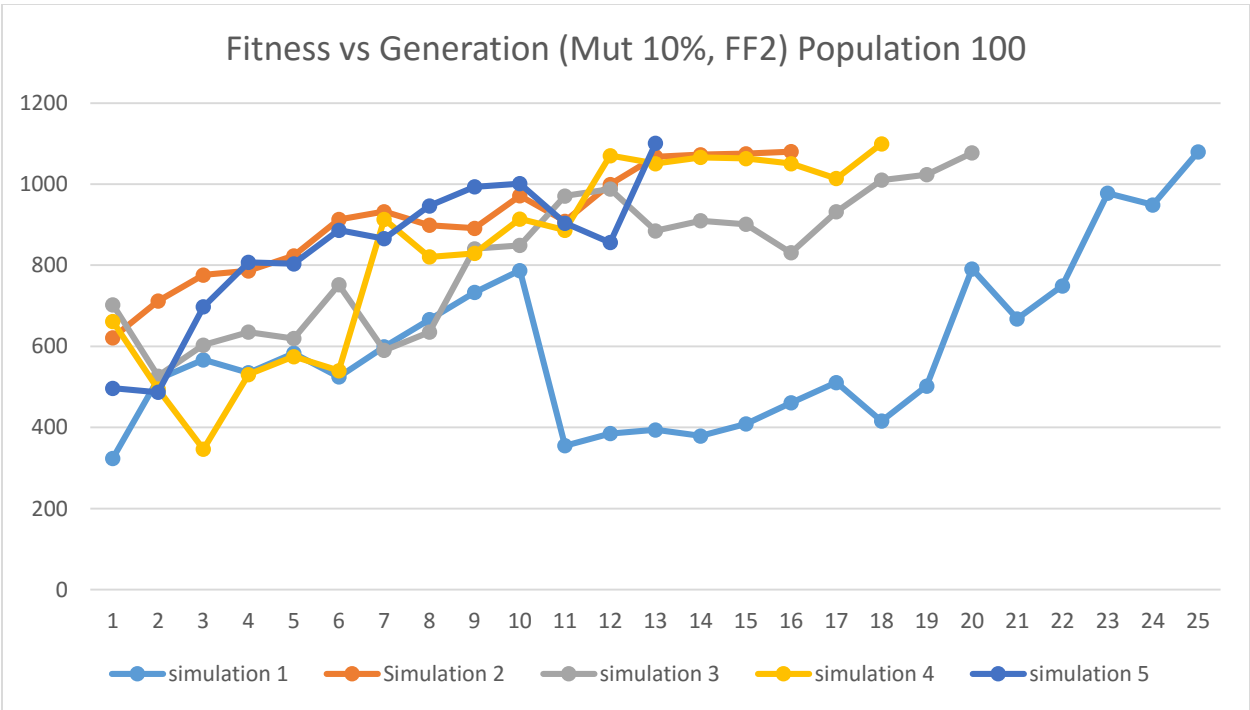
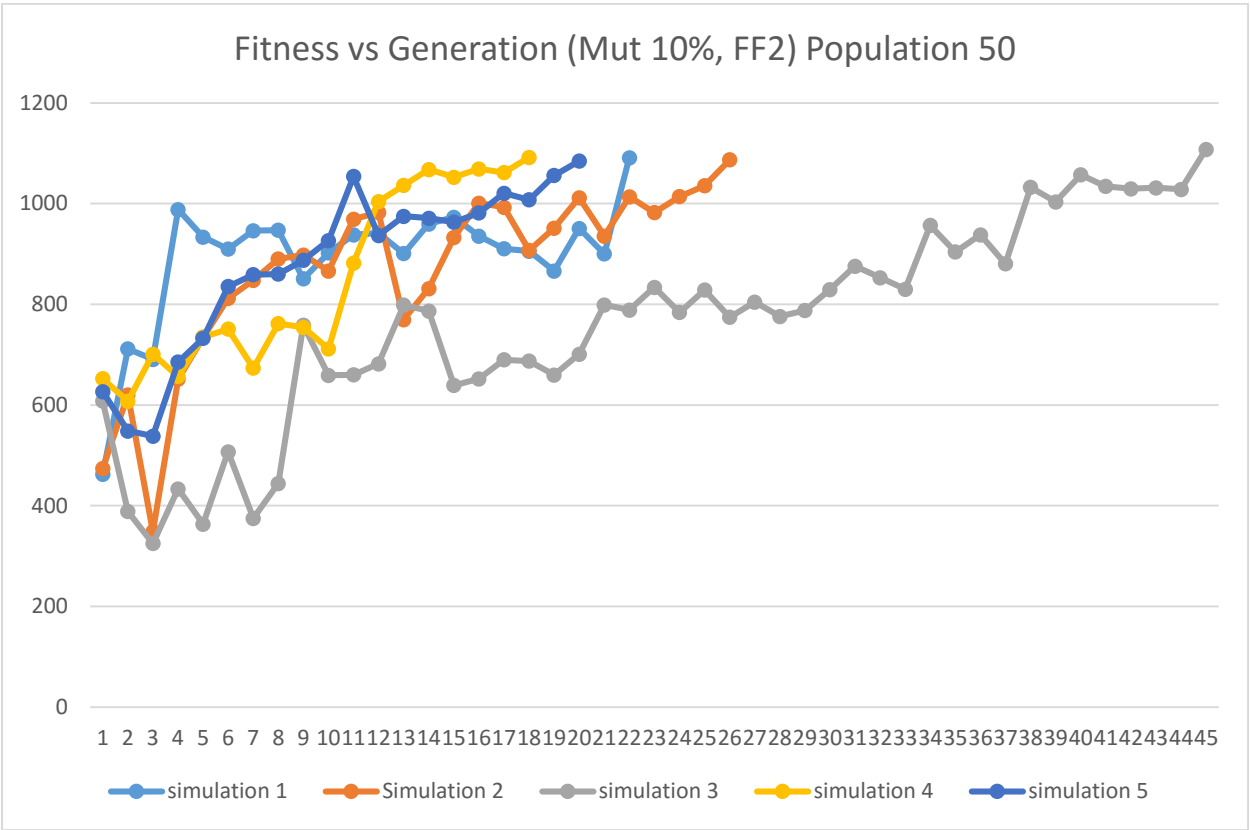


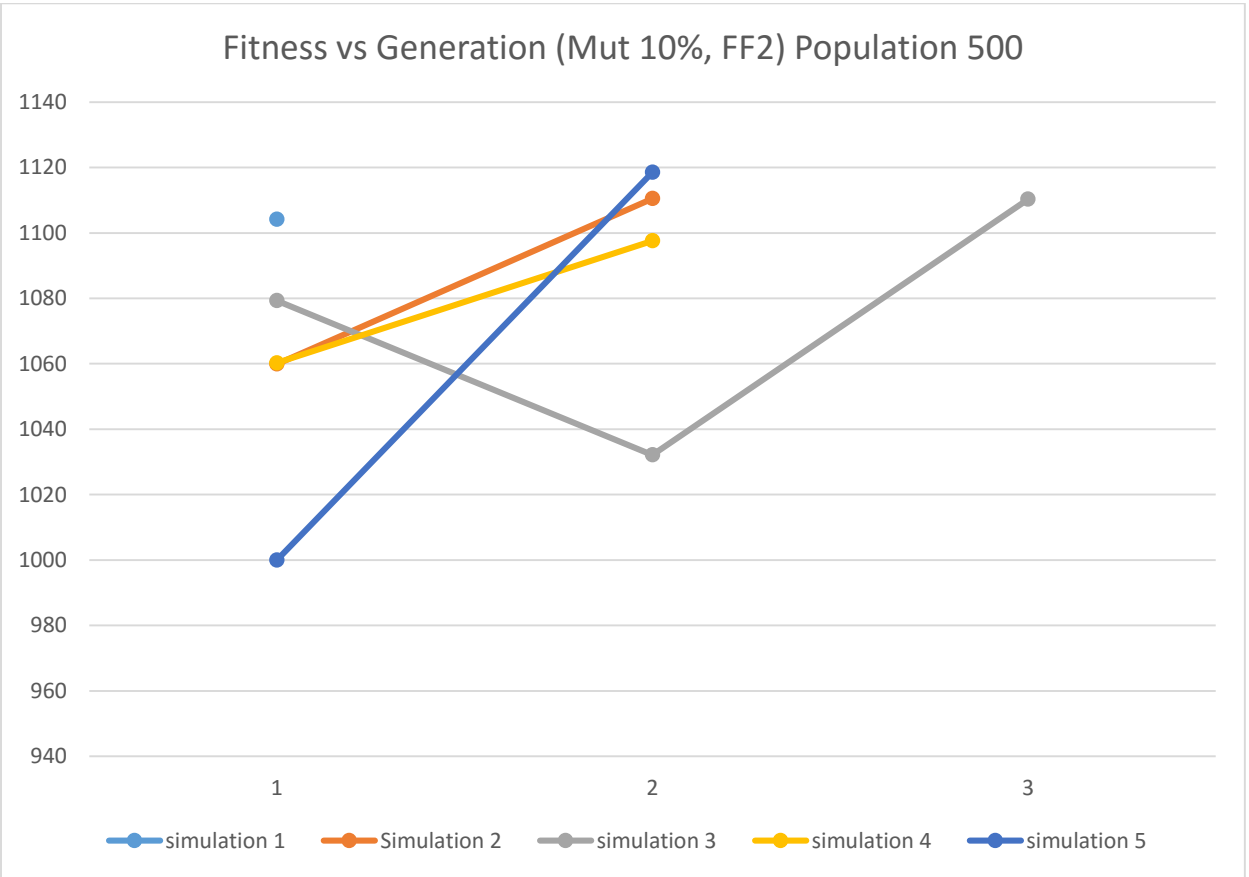
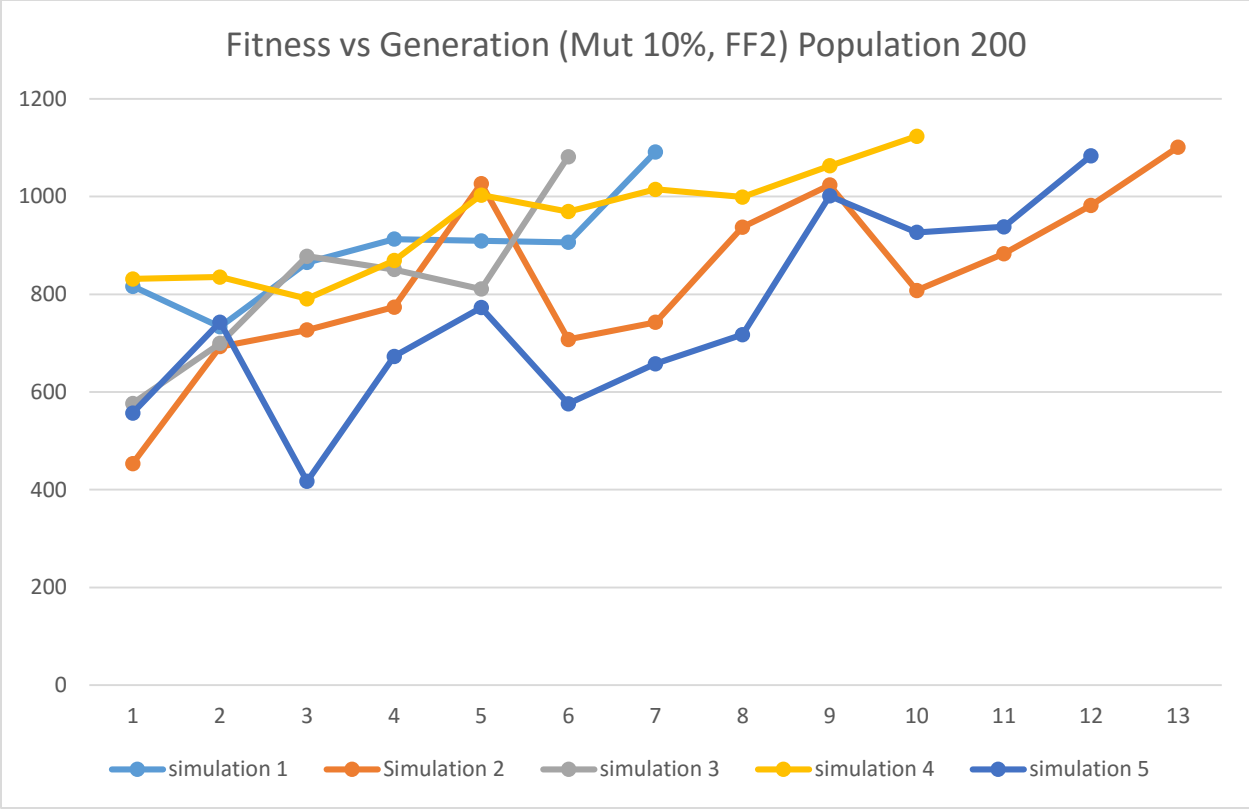


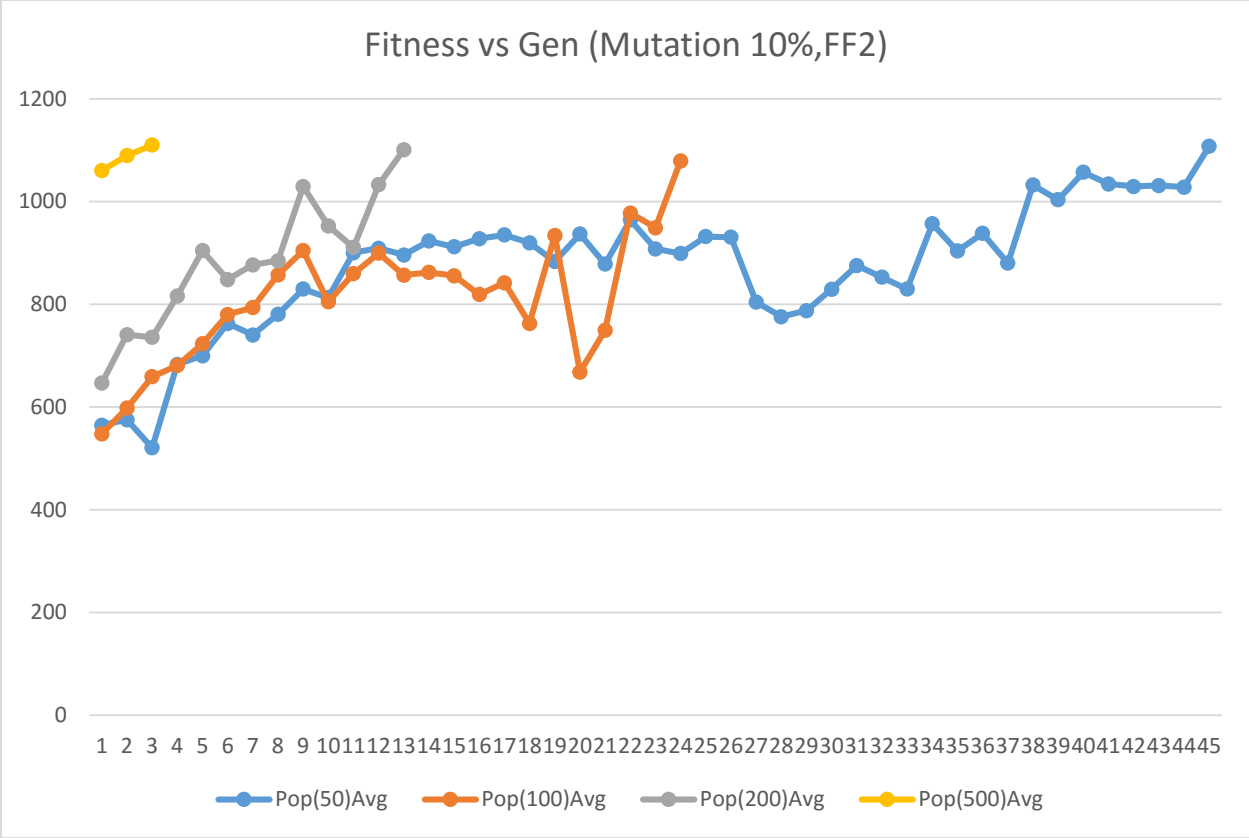
Fitness vs Gen (Mutation 4%,FF2)



Results when Mutation Rate is 10%:

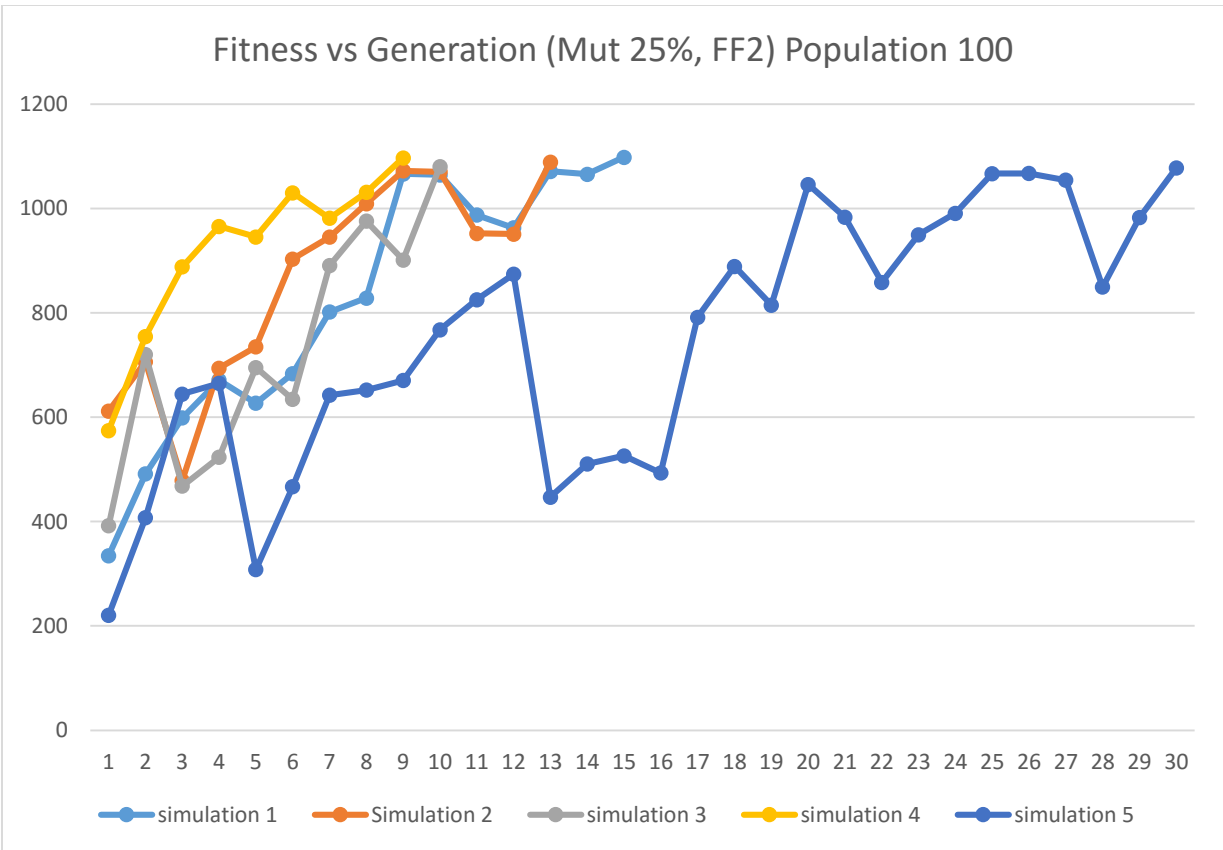
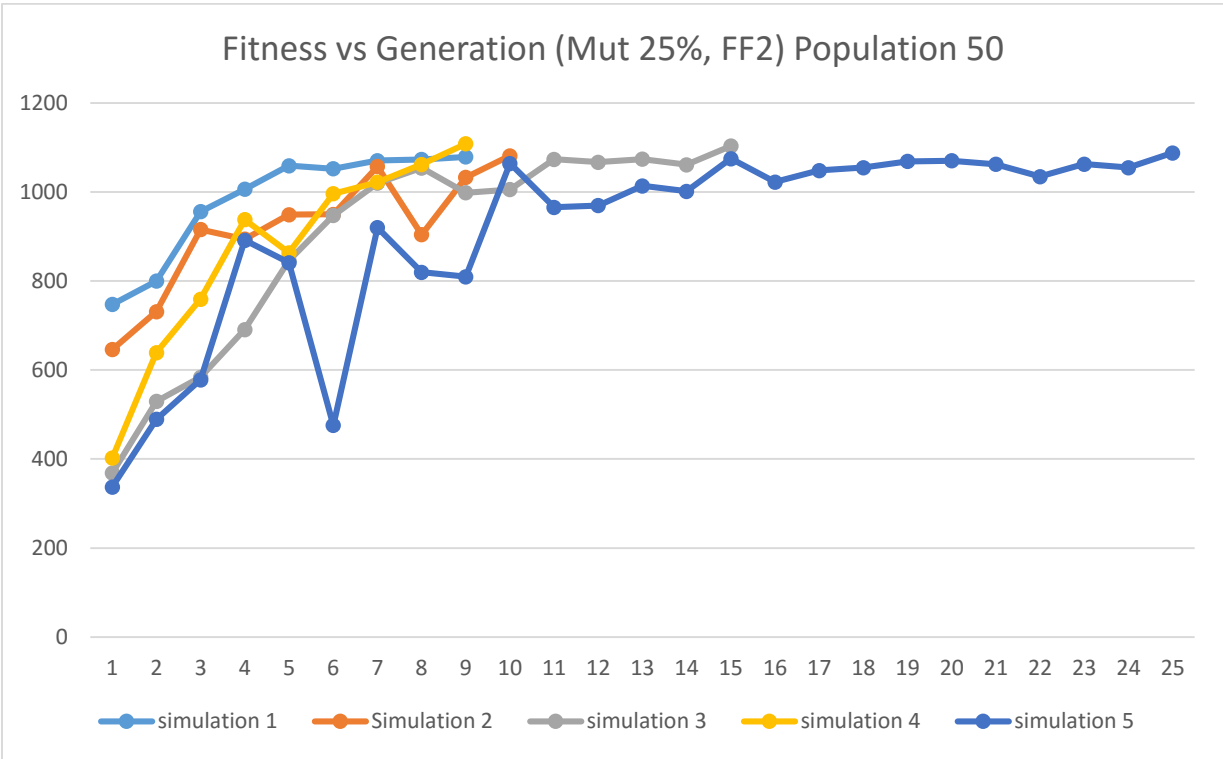


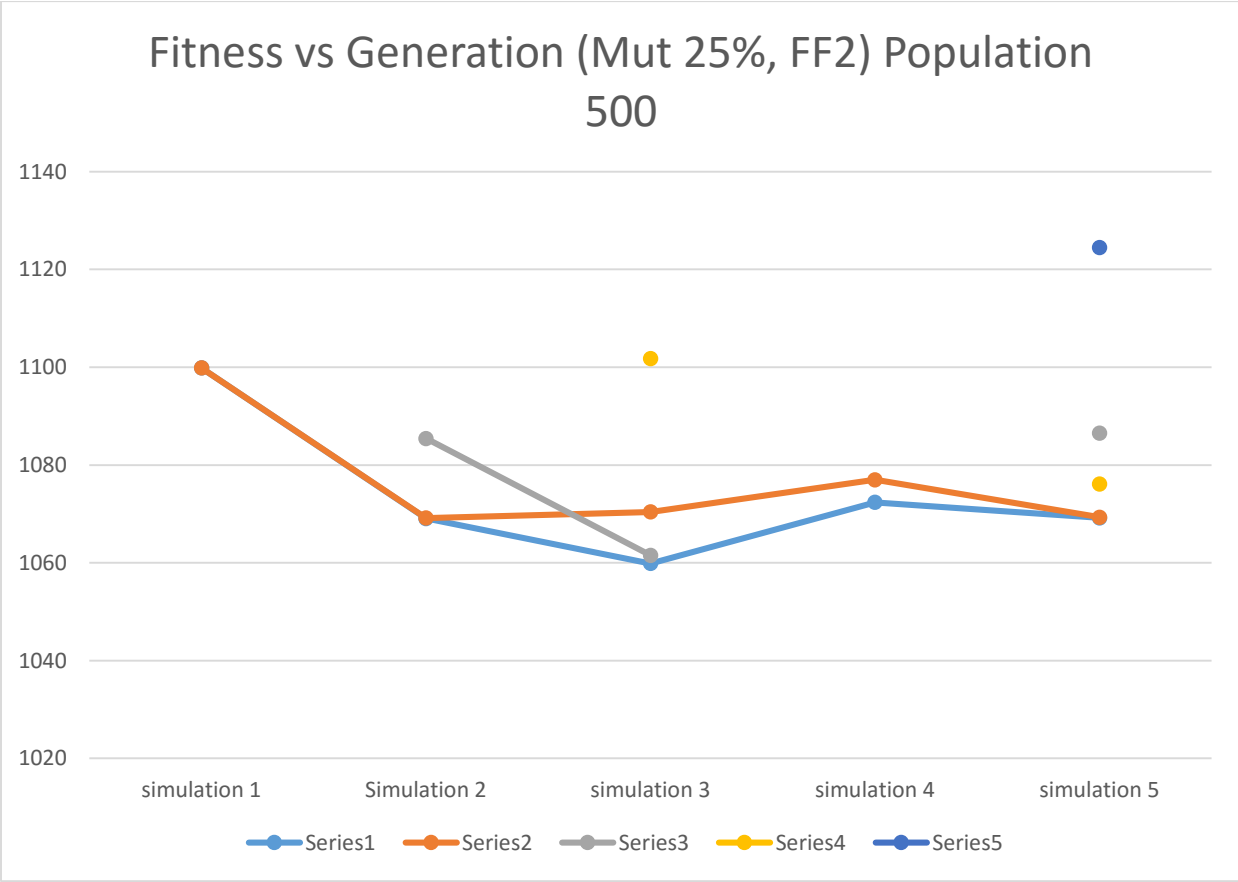
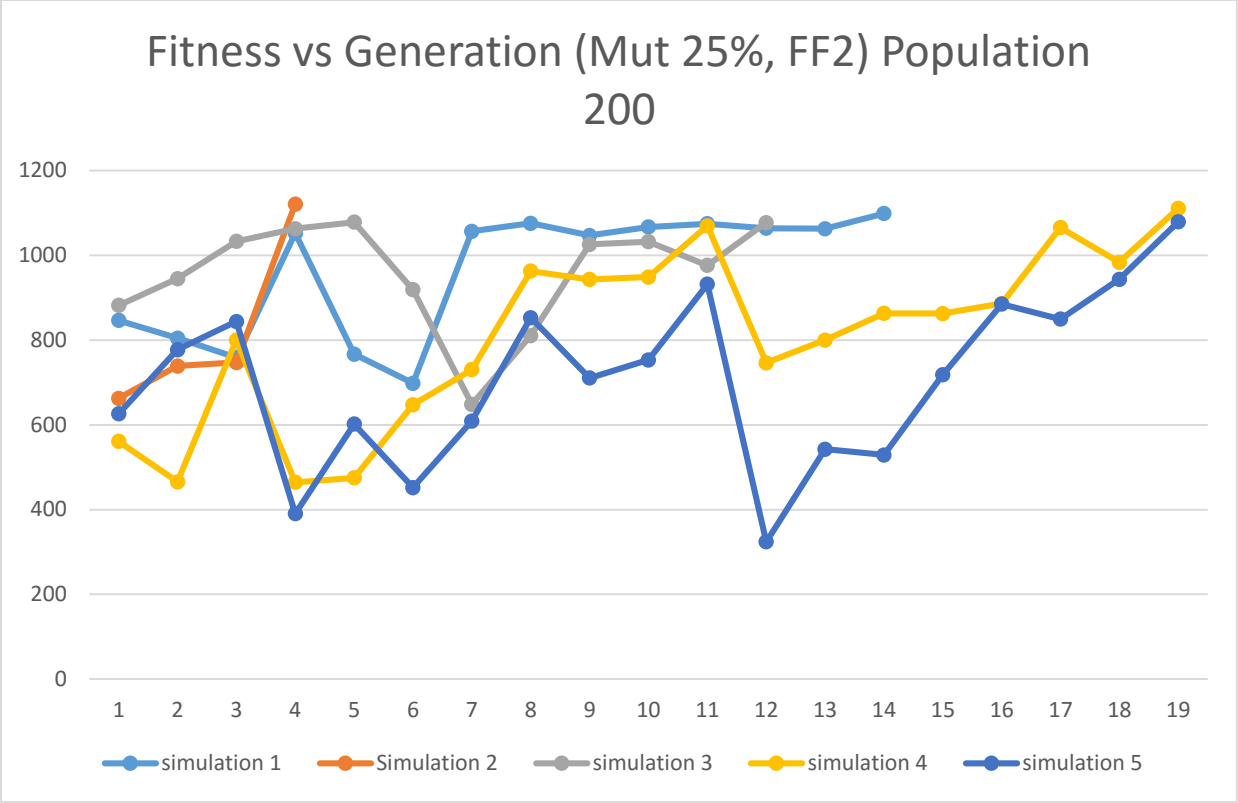




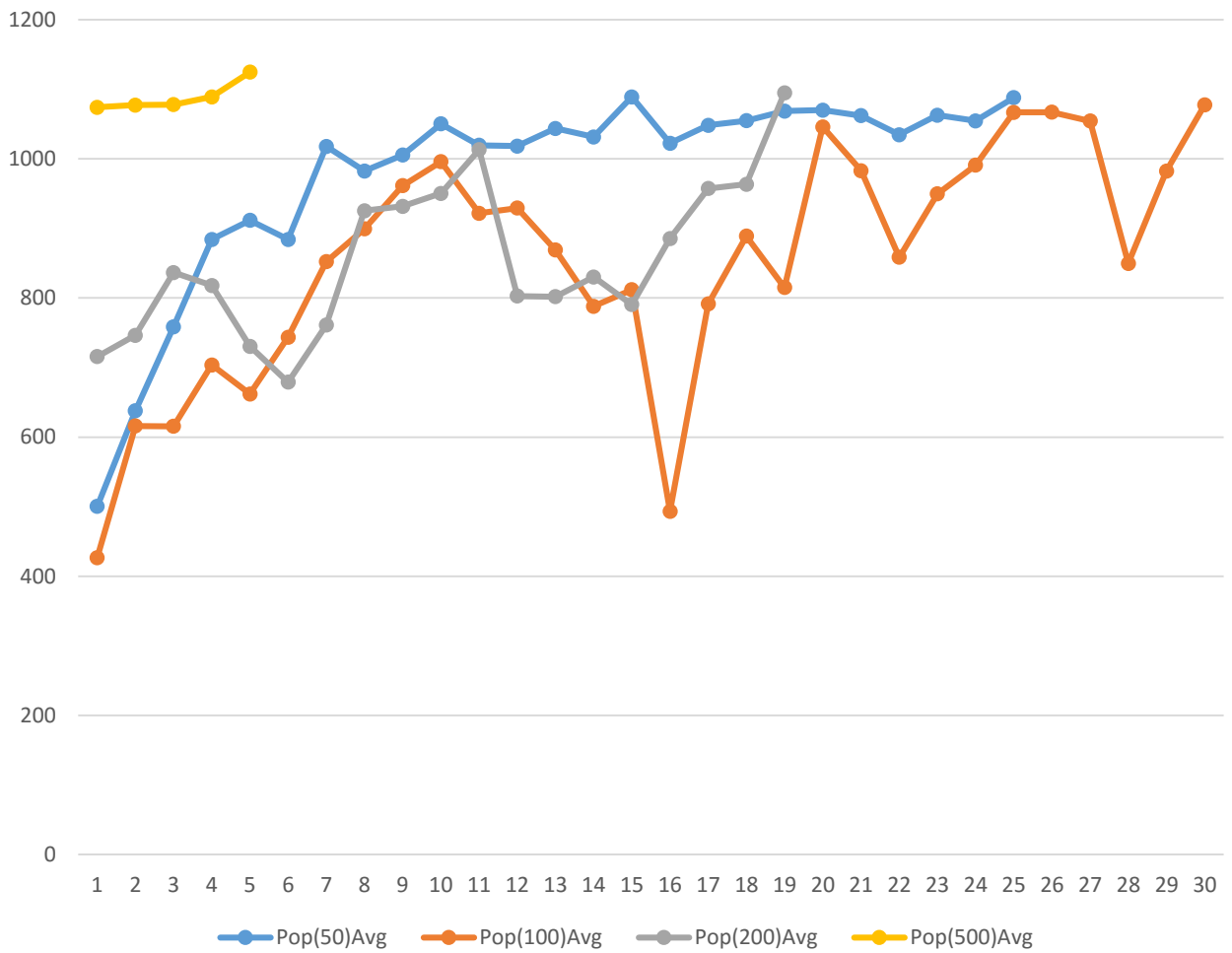


Results when Mutation Rate is 25%:

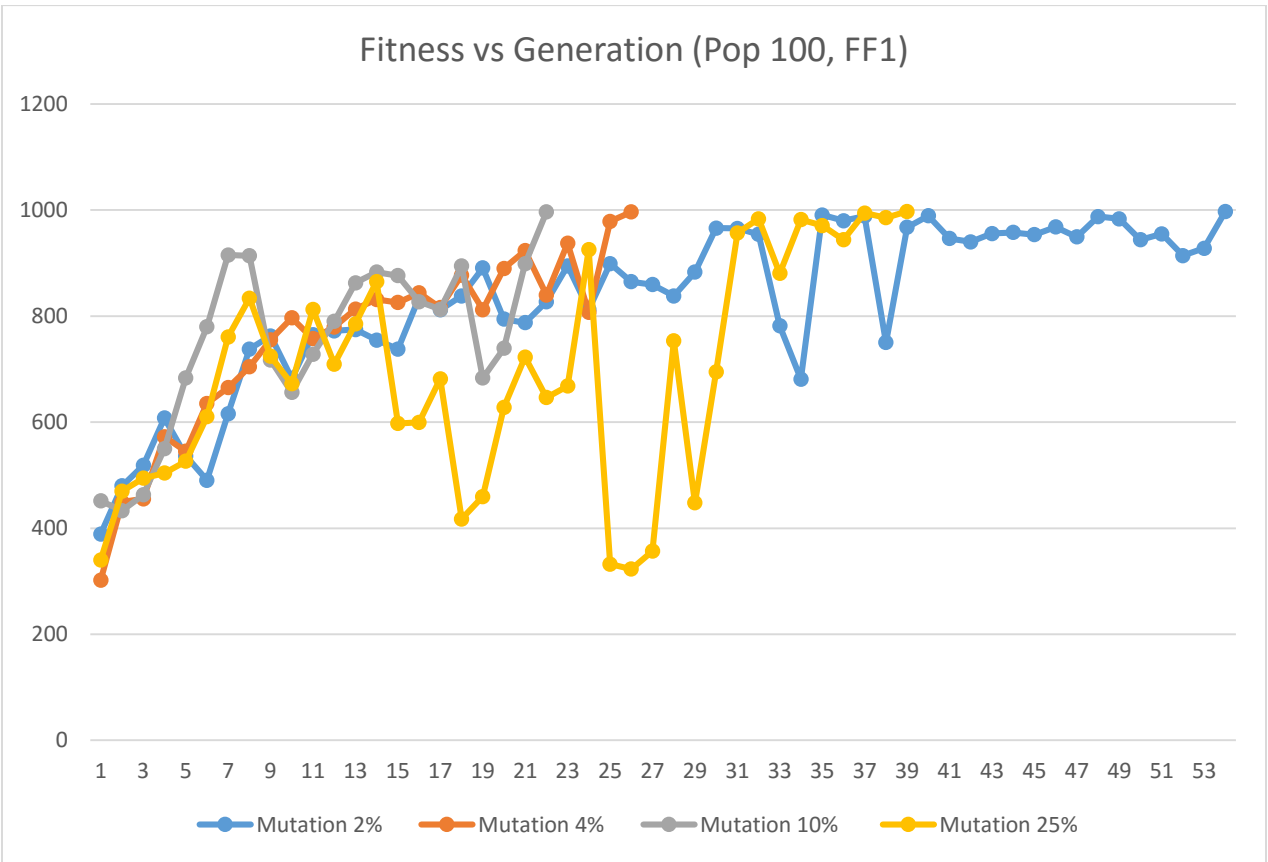
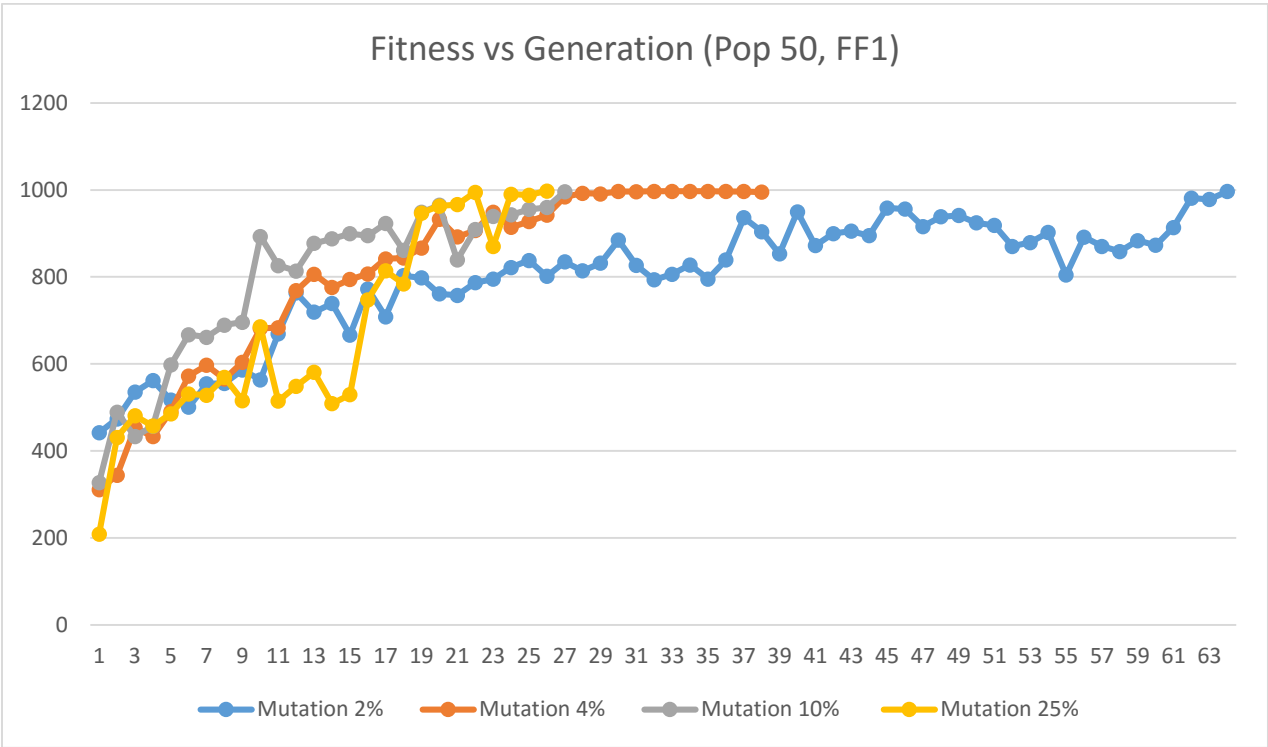


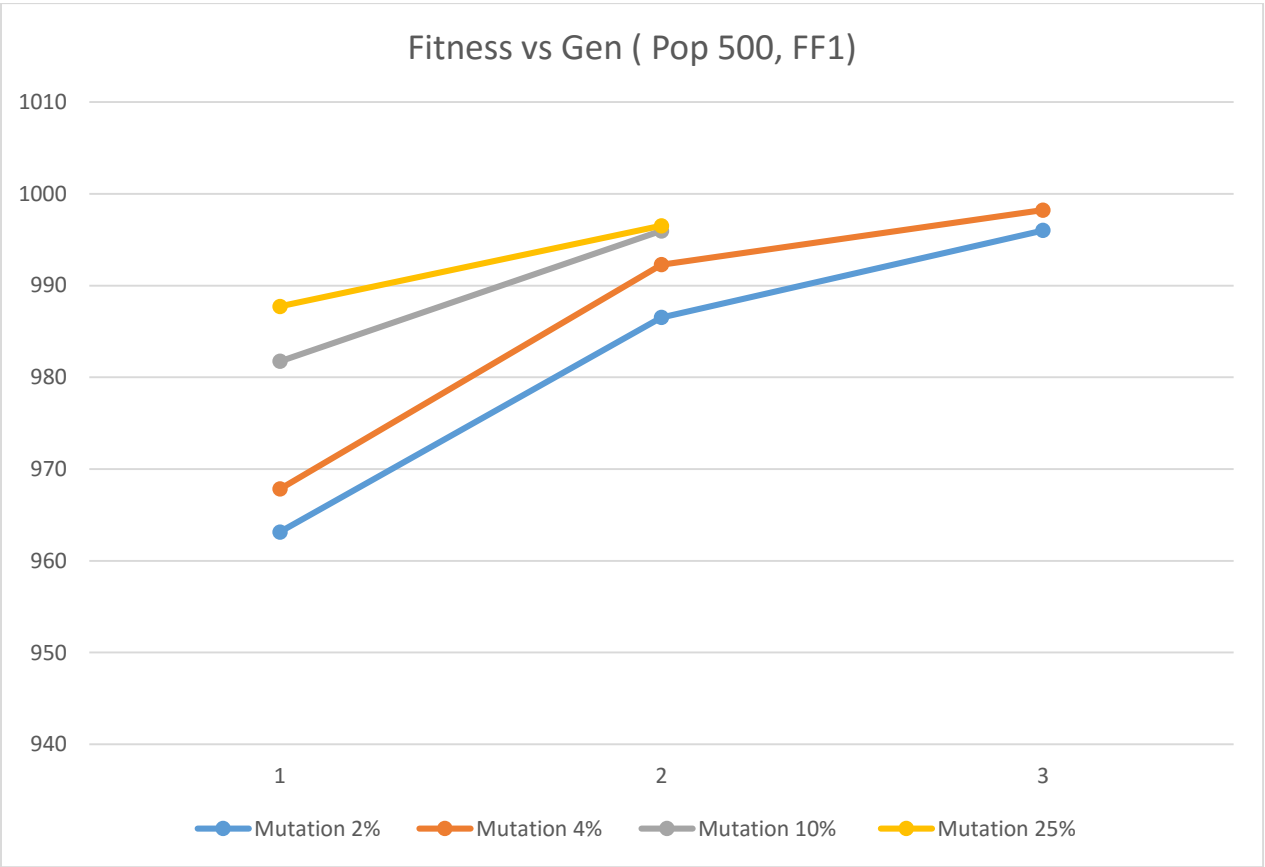
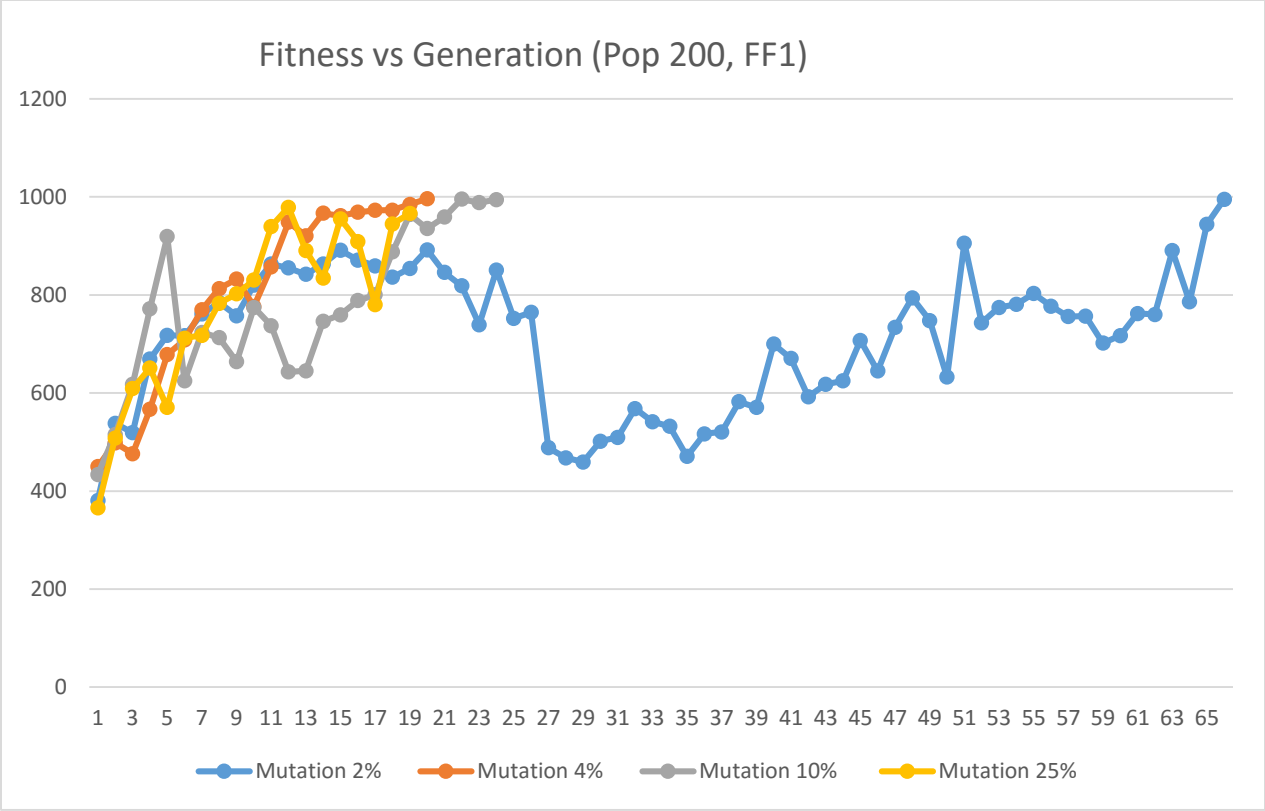


Fitness vs Gen (Mutation 25%,FF2)

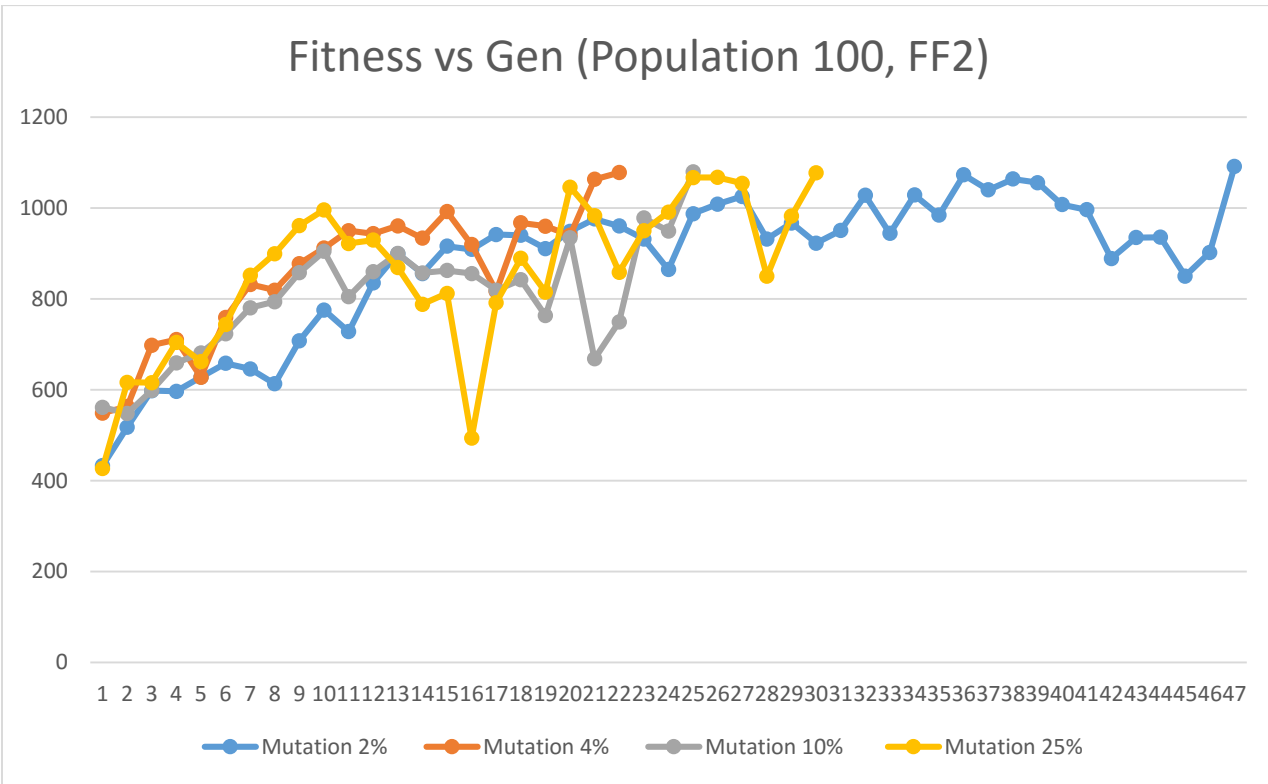
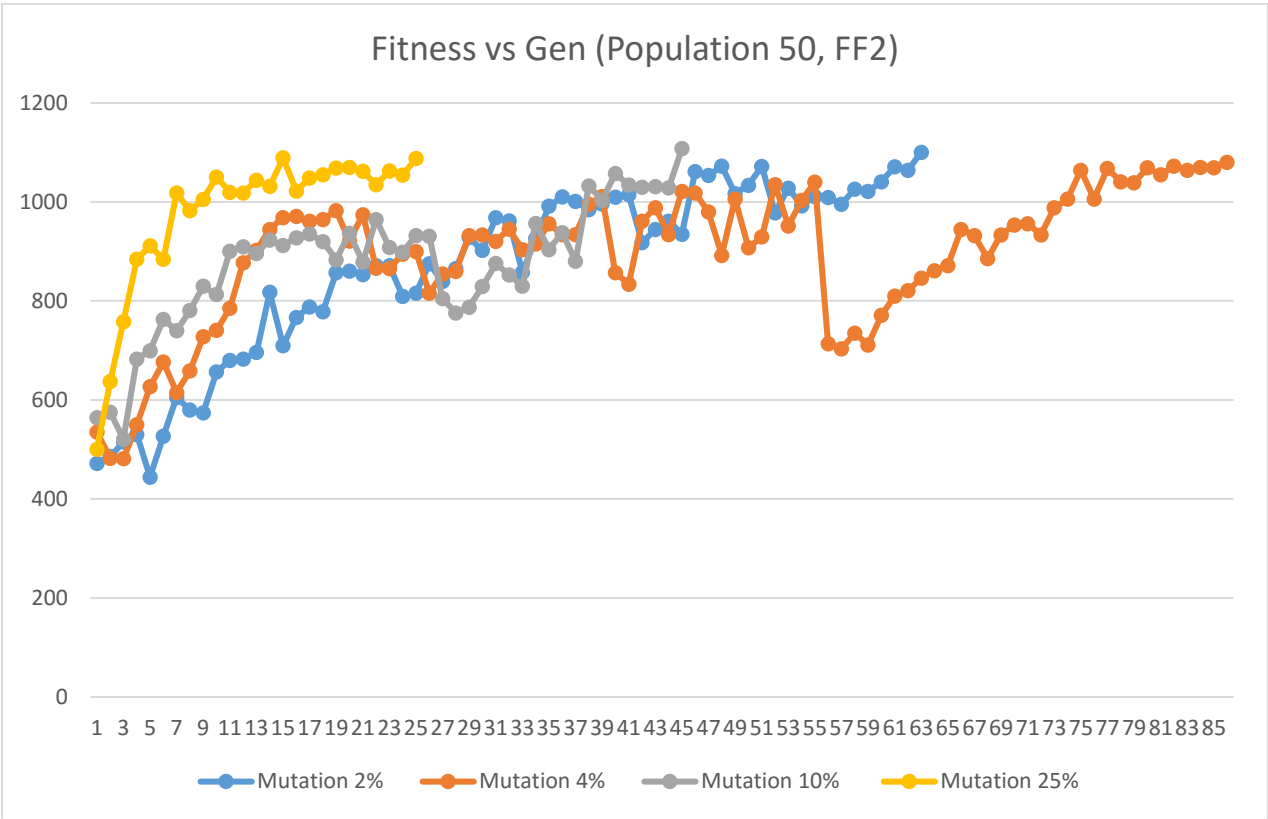


Mutation Rate Comparison (Fitness Function 1):

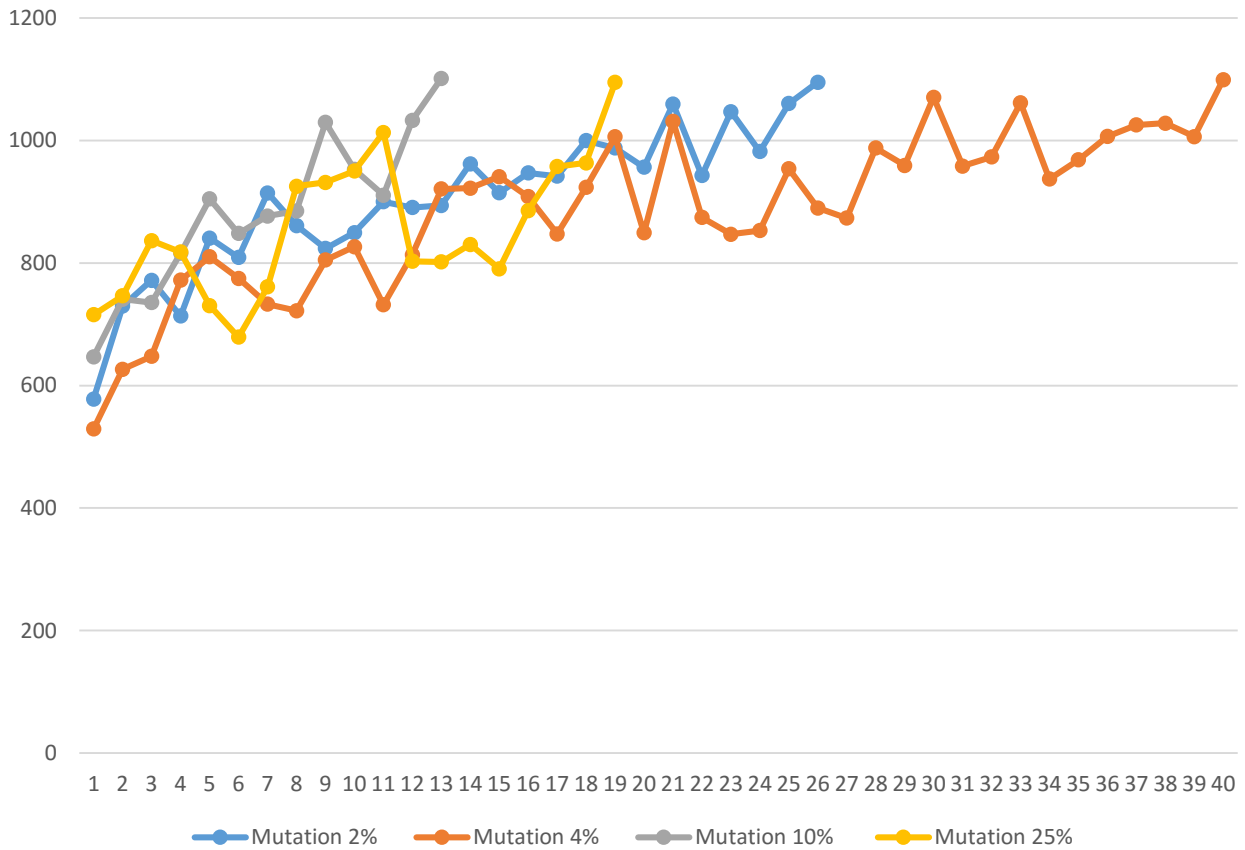




Mutation Rate Comparison (Fitness Function 2):



### Fitness vs Gen (Population 200, FF2)



### Fitness vs Gen (Population 500, FF2)

