Genetic Cars Project

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Base Case (No altercations)

Mutation rate:	5%
Mutation size:	100%
Floor:	fixed
Gravity:	Earth (9.81)
Elite clones:	1

Top Scores:

#1: 156.23 d:150.43 h:0/6.02m (Gen 28)
#2: 156.17 d:149.68 h:0/6.01m (Gen 93)
#3: 156.02 d:149.58 h:0/6.03m (Gen 71)
#4: 155.86 d:149.63 h:0/6.02m (Gen 64)
#5: 155.59 d:150.44 h:0/6.21m (Gen 74)
#6: 155.29 d:149.31 h:0/6.12m (Gen 92)
#7: 153.67 d:147.87 h:0/6.03m (Gen 29)
#8: 153.64 d:147.81 h:0/6.01m (Gen 99)
#9: 153.5 d:147.87 h:0/6.02m (Gen 61)
#10: 153.4 d:147.74 h:0/6.01m (Gen 49)

During this base case testing I realized that my leading clone was not able to surpass its best as it would continuously get stuck and be unable to move on. On top of this no clones after the 30th generation were able to combat this problem.

Decrease Gravity Increased Elite Clones

Mutation rate:	5%
Mutation size:	100%
Floor:	fixed
Gravity:	Uranus (8.7)
Elite clones:	3

Top Scores:

#1: 166.77 d:162.39 h:-6.44/2.68m (Gen 46)
#2: 166.26 d:162.04 h:-6.83/2.68m (Gen 16)
#3: 165.72 d:160.35 h:-6.2/2.81m (Gen 48)
#4: 165.72 d:160.35 h:-6.2/2.81m (Gen 49)
#5: 165.67 d:160.39 h:-6.42/2.74m (Gen 27)
#6: 165.62 d:160.05 h:-6.22/2.86m (Gen 11)
#7: 165.56 d:160.4 h:-6.44/2.71m (Gen 33)
#8: 165.41 d:160.36 h:-6.62/2.66m (Gen 29)
#9: 165.38 d:160.46 h:-6.69/2.87m (Gen 26)
#10: 165.24 d:160.23 h:-6.84/2.68m (Gen 15)

I lowered the gravity to try and decrease the chances of my cars getting stuck on the map, I firstly tried a lower gravity of 3.7 but it was very apparent that was not enough to allow the cars to surpass the previous distance so I settled for 8.7 instead. Unfortunately these stalled out before the 50th generation.

Mutation Changes and Map Changes

Create new world with seed

tonyisagreatname Go!

Mutation rate:	20%
Mutation size:	75%
Floor:	fixed
Gravity:	Uranus (8.7)
Elite clones:	2

Top Scores:

#1: 134.34 d:129.65 h:-3.25/3.93m (Gen 88)
#2: 134.27 d:129.42 h:-3.25/3.75m (Gen 96)
#3: 134.15 d:129.2 h:-2.99/3.96m (Gen 122)
#4: 133.72 d:129.07 h:-3.05/3.75m (Gen 73)
#5: 133.71 d:128.73 h:-2.93/3.51m (Gen 82)
#6: 133.43 d:129.43 h:-2.98/3.74m (Gen 47)
#7: 133.17 d:128.28 h:-3.18/3.85m (Gen 97)
#8: 133.11 d:128.32 h:-3.24/3.6m (Gen 98)
#9: 133.06 d:128.27 h:-3.15/3.9m (Gen 43)
#10: 133.04 d:129.01 h:-2.95/3.69m (Gen 69)

Since last generation stalled out quiet quickly I have decided to start messing around with the mutation size and rate. I am hoping by increasing it mutations the winning gene will be persistent enough to allow the newer generations to come with real improvements. I also tried a new map, and while this variation did continue to improve vastly longer, it had a hill in which every car could not get past.

Regular Gravity and New Map

Create new world with seed

thatmapsucked Go!

Mutation rate:	20%
Mutation size:	75%
Floor:	fixed
Gravity:	Earth (9.81)
Elite clones:	2

Top Scores:

#1: 177.75 d:173.08 h:-13.34/3.96m (Gen 118)
#2: 177.72 d:173.15 h:-13.29/3.99m (Gen 115)
#3: 177.71 d:173.09 h:-13.31/4.76m (Gen 148)
#4: 177.46 d:172.67 h:-13.31/4.7m (Gen 135)
#5: 177.44 d:172.89 h:-13.28/3.96m (Gen 119)
#6: 177.34 d:172.46 h:-13.32/4.7m (Gen 136)
#7: 177.22 d:172.41 h:-13.33/4.7m (Gen 146)
#8: 176.93 d:172.31 h:-13.54/4.67m (Gen 101)
#9: 176.76 d:172.4 h:-13.3/4.54m (Gen 149)
#10: 176.74 d:172.8 h:-13.34/3.96m (Gen 100)

Last map we seemed to hit close to the maximum possible distance a car could travel as well as fixed the issue of the cars mutations not being often/effective enough. On top of this lessening the gravity hasn't allowed us to surpass our base case so I have reset that back to normal. This worked well however we encountered another unbeatable obstacle it seems.

Generation 828

Final Attempt - Lowered Mutation Rate Raised Size

Mutation rate:	10%
Mutation size:	100%
Floor:	fixed
Gravity:	Earth (9.81)
Elite clones:	2

Top Scores:

#1: 179.33 d:173.26 h:-13.34/4.18m (Gen 13)
#2: 179.06 d:173.74 h:-12.95/4.72m (Gen 182)
#3: 178.98 d:174.17 h:-13.31/4.8m (Gen 0)
#4: 178.97 d:172.99 h:-13.05/4.47m (Gen 84)
#5: 178.8 d:173.18 h:-13.01/4.42m (Gen 144)
#6: 178.63 d:172.91 h:-13.34/4.18m (Gen 14)
#7: 178.56 d:172.73 h:-12.95/4.41m (Gen 99)
#8: 178.46 d:172.72 h:-13.34/4.18m (Gen 7)
#9: 178.45 d:173.24 h:-12.95/4.23m (Gen 65)
#10: 178.42 d:173.62 h:-13.07/4.41m (Gen 111)

The last attempt was great however it had one car that original surpassed an obstacle, yet those traits were never passed down to the following generations. I am hoping this new configuration allows the winners to pass down more of the traits that make them great. I think I might buy a lottery ticket after this Gen 0. For reference on this one out of pure curiosity I took a nap and came back after over 800 generations.

Overnight Mutable Floor

Mutation rate:	10%
Mutation size:	100%
Floor:	mutable
Gravity:	Earth (9.81)
Elite clones:	2

Top Scores:

#1: 414.77 d:410.42 h:-4516.34/4.62m (Gen 170)
#2: 398.49 d:394.29 h:-4288.86/2.16m (Gen 1314)
#3: 383.34 d:379.36 h:-4147.65/5.55m (Gen 445)
#4: 298.23 d:294.85 h:-2804.42/11.25m (Gen 655)
#5: 255.95 d:250.96 h:-22.65/5.16m (Gen 672)
#6: 250.11 d:247.32 h:-5.41/5.87m (Gen 802)
#7: 249.13 d:245.18 h:-7.34/11.17m (Gen 742)
#8: 248.27 d:243.73 h:-14.74/4.13m (Gen 244)
#9: 245.86 d:241.9 h:-7.14/6.26m (Gen 883)
#10: 245.08 d:241.31 h:-13.18/4.29m (Gen 240)

It seemed like a big problem was cars were getting stuck on a certain part of the map so for an extra attempt to get a new distance record I set the floor to mutable and let it run overnight. I know this was not needed but I was curious!

New Parameter (Torque)

Considering I have been obsessing over getting this cars up hills, I decided to add a parameter that would affect the torque of the cars. While this still did not let them climb some hills, it was an interesting experiment and I'm sure it would match nicely with gravity.

Repo: https://github.com/tpsolana/HTML5_Genetic_Cars