research outline

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goals

- check adaptation of traits
- argue on "mixing-input trick"
- experiments for validating adaptation of behavior
- neural networks

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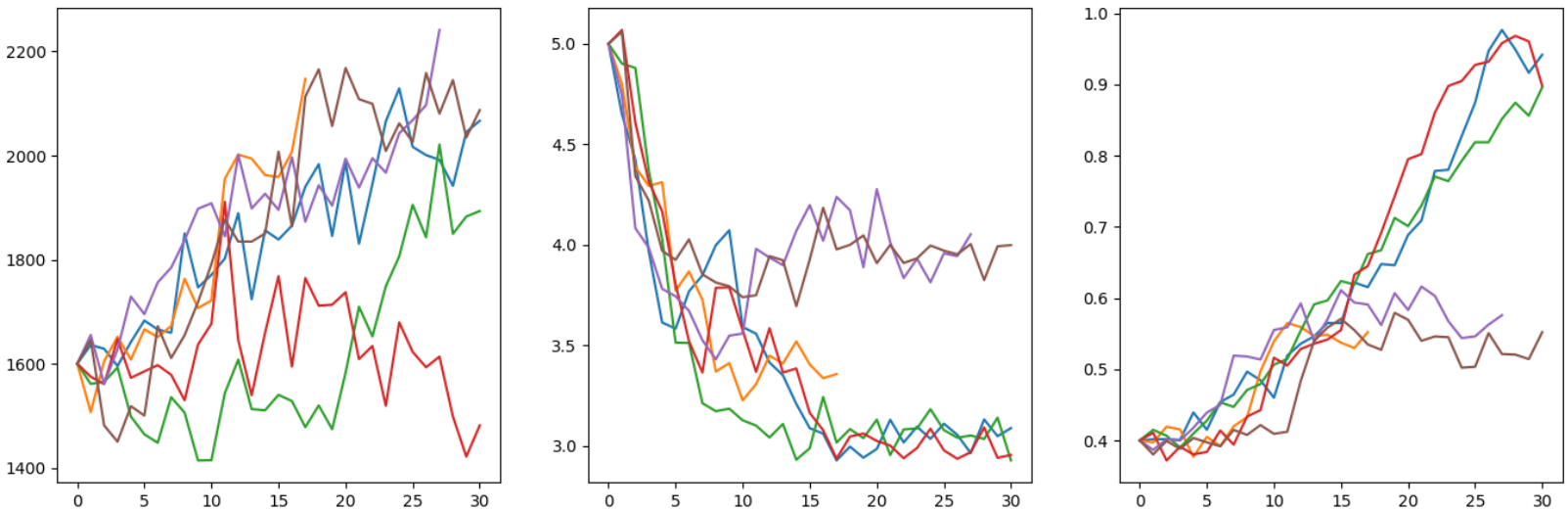
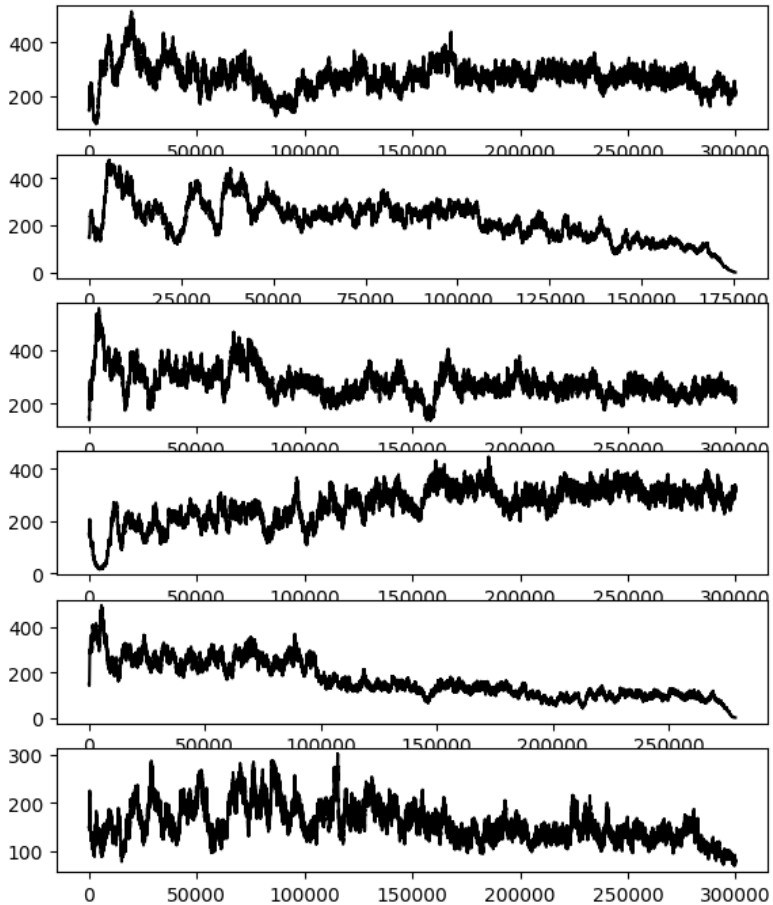
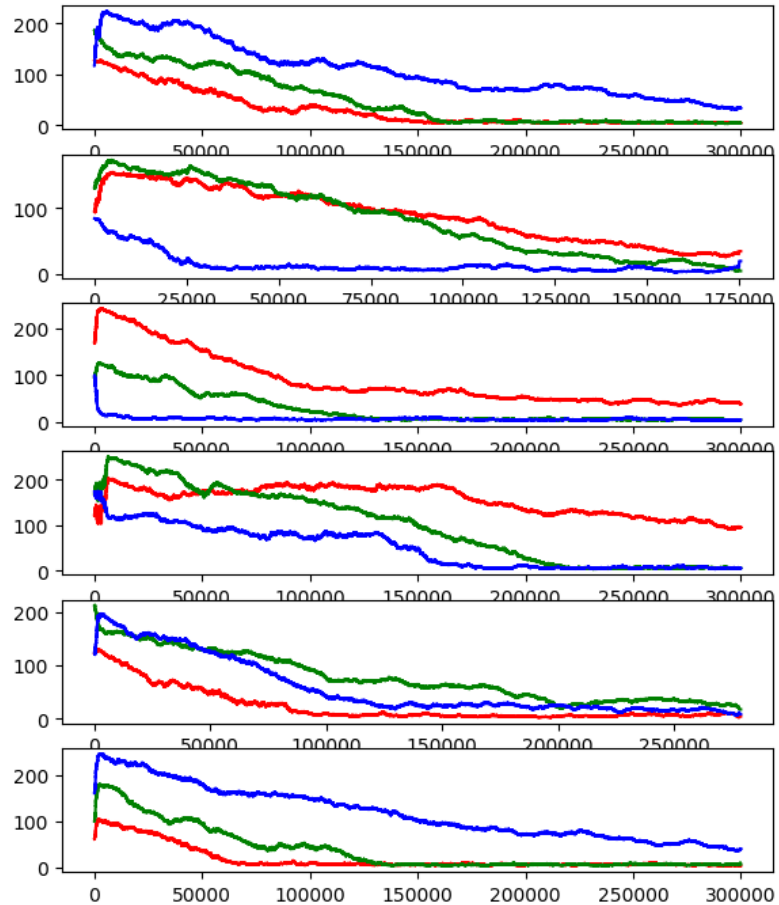
example of trait adaptation

maximum age / maximum size / nutritient accumulation rate



evidence of intelligence?!





mixing input trick

- randomly shuffle the input of all minions
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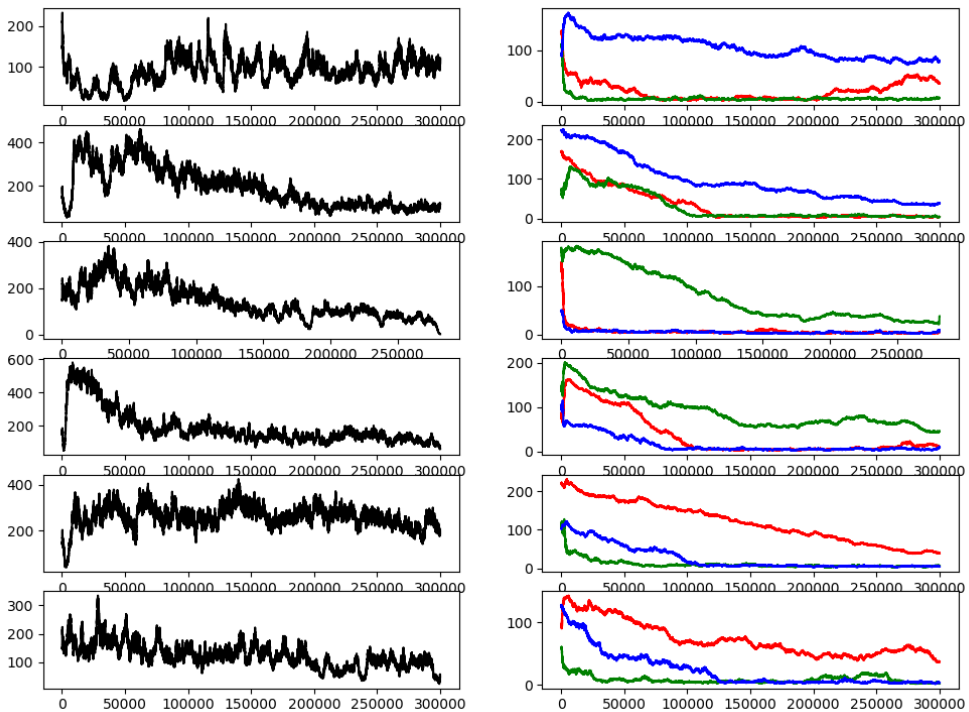

- no difference??!!!

A tiny coding mistake

- the mutation of color trait was implemented roughly like:
  - (r, g, b) =(average of parent's)
  - $\delta r, \delta g, \delta b \sim N(0, \sigma^2)$
  - $(r', g', b') = (int(r + \delta r), int(g + \delta g), int(b + \delta b))$
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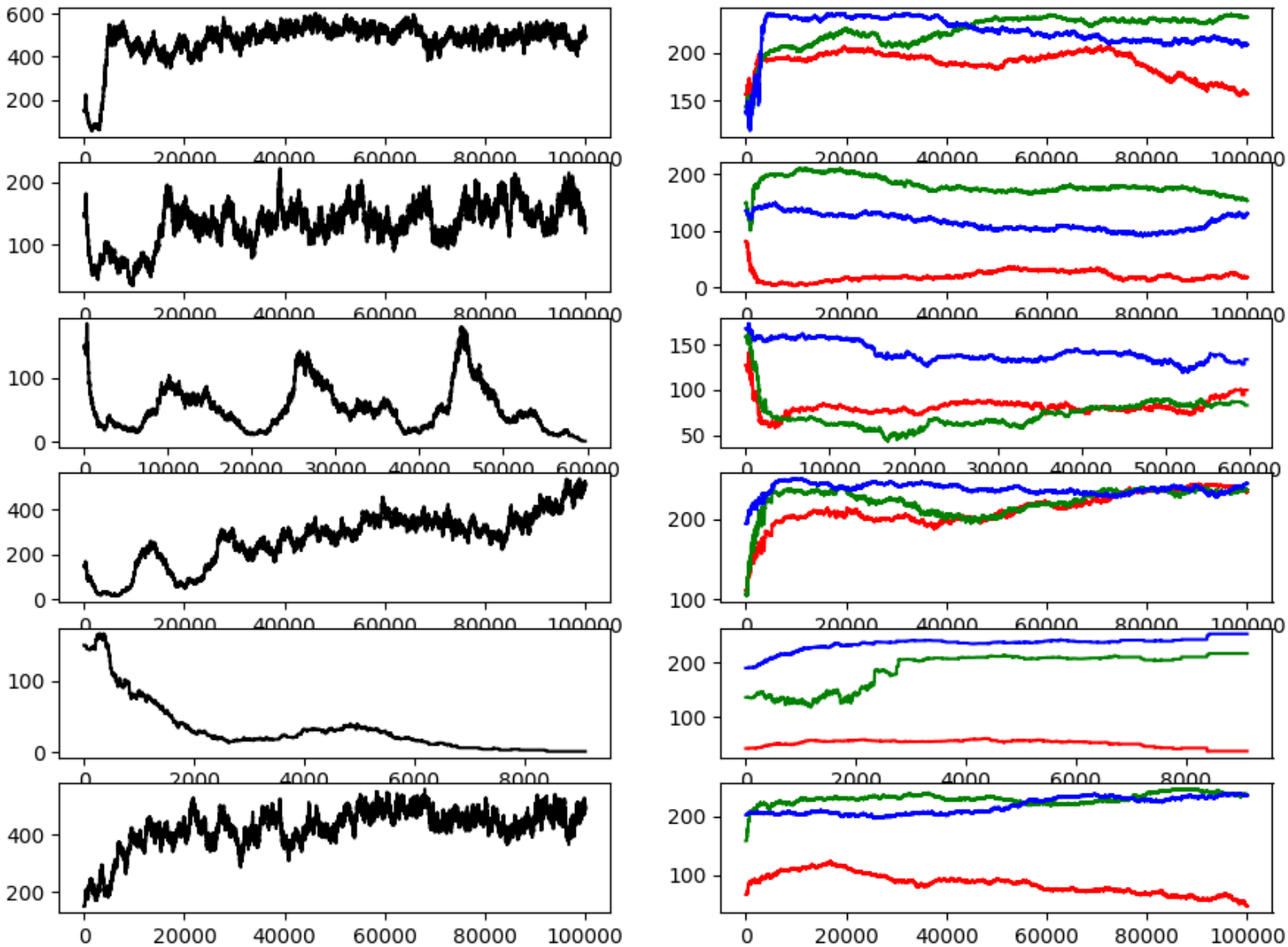
- What's wrong here??
- "int" was implemented by python int function...
- that returns n for any x such that $n \leq x < n + 1$
- which has bias to the smaller integer

after fixing mistake...



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scenarios

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Scenario 1

- The average color decreased as time passed
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Scenario 2

- It was observed that foods are consumed more and more rapidly
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- Not quite, it can be merely due to increased default average speed
- Then, how do we determine whether both the speed and the intelligent caused it?

logic of the trick I

- Let's say we observed a phenomenon P.
- We suspect that the evolution of intelligence caused P, but we also figured out some other factors that could affected P
- If we could eliminate the effect of "intelligence", then we might solve the problem, by seeing whether P is still observed. BUt how?
- First attempt : just an arbitrary behavior(moment, action, etc.).$\Rightarrow$ Then not only the intelligence is affected. We have to preserved at least the "background behaviors" which has nothing to do with intelligence.

logic of the trick II

- Manually figuring out some aspects of "background behaviors" and applying them to make "random behaviors" is conceivable. However, it is just an ad-hoc approach.
- Second approach : We could supply the creatures with some "random input", which prevent them from perceive correctly and respond accordingly, thus disturbing intelligence completely.
- Problem : how do we generate the random input? - it should not be completely irregular. To reproduce the "background behavior", we should at least sample from the "plausible inputs"
- Solution : randomly shuffle all the inputs!

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outline

- task-based assessments
- harsh environment assessments