Chapter 13

Chapter V: Recursive Structures and Processes

Please! Call it GNU. – Richard Stallman

Please! Refer to Curran Kelleher's handout on Recursive Structures and Processes. – Justin Curry

Below are questions which I concocted while taking Rob Speer's Gödel, Escher, Bach undergraduate seminar (SP.258). Below those I have some new questions that I wrote forgetting that I had written the old questions years ago. Enjoy!

13.1 Old Questions

Thoughts on Intelligence

1. Can recursion explain creativity?
2. If intelligence seems to depend on recursion, why are humans so bad at it? Ex. Kasparov vs. Machine

Sameness-and-Differentness

1. What is a better investigation of sameness? Is it probabilistic? To what degree can we abstract parts of something, and still have a meaningful equivalence relation?

Metaphysics and Theology

1. Is Hofstadter's analogy for God a serious one? Something which is unattainable, or stands outside the system? If God is the universe, and part of the universe prays to God, then is God recursive?
2. What would happen if I made the following prayer: "I pray that this prayer is not answered."

13.2 New Questions

1. We have provide lots of examples of recursion, self-similar fractals, and so on. Come up with some other contexts in which recursion appears.
2. What do you think of DRH's agnostic friend on page 142, who calls Gplot "a picture of God"?
3. To what extent are Feynman diagrams a formal system?
4. What type of isomorphism links all the butterflies in Escher's *Butterflies* on page 148?
5. What is the connection between recursion and isomorphism? What does Hofstadter say the connection is?
6. Define modularization.
7. Define subroutine or procedure.
8. What is the essence of modularity in programming?
9. Discuss the following quote: "Modularity exists, of course, in hi-fi systems, furniture, living cells, human society — wherever there is a hierarchical organization." (GEB pp. 150)
10. What is Hofstadter's Law? Was he right about a computer program being world champion?
11. What is the role of recursion in intelligence?

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