

Review questions for Philosophy 115 final “Computation and Philosophy”, by Rudy Rucker, SJSU.

We’ll meet at 4:30 on Thursday, December 17, 2005, in our usual room, Sweeney Hall 241. We’ll have a short written final followed by pizza. Here are some sample questions I might ask. I’ve labeled each question with the section of *The Lifebox, the Seashell, and the Soul* in which the answer can be found.

(4.3) (a) Describe the three-state Brian’s Brain CA rule. (b) Discuss how each of the three states corresponds to a state of a brain neuron. (c) What kinds of mental process are similar to Brian’s Brain gliders? (d) What kinds of mental process are similar to Belusouff-Zhabotinsky scrolls?

(4.4) Describe Damasio’s representation of consciousness as a process in the brain. Mention movie-in-the-brain, proto-self, and feelings.

(4.5) What do I mean by a lifebox?

(4.6) (a) Discuss the difference between human-brain-equivalent hardware vs. software. (b) Make an estimate of when we might design brain-equivalent hardware, saying a bit to justify your estimate. Mention Moore’s Law. (c) Make an estimate of when we might design brain-equivalent software, discussing how this might be accomplished.

(4.7) Outline Wolfram’s argument that computation-theoretic considerations allow determinism and free will to be compatible.

(5.1) (a) What are the three rules of the Reynolds boid simulation? (b) Think of a conversation among a group of people being like a flock of boids in a shared mental space. Which conversational conventions correspond to the three Reynolds rules?

(5.2) (a) Describe the computer analogies to language, art, and telepathy. (b)

Describe four styles conversation in terms of Wolfram's four complexity classes.

(5.3) (a) Give an example of a power law in society. (b) What does it mean to say society is in a critical state?

(5.4) Describe four kinds of human history in terms of Wolfram's four complexity classes.

(6.1) (a) Draw the Venn diagram of the T, P, and C classes of thoughts, physical processes and computations. (b) Which of the eight possible ontologies described do you like best? Justify your answer.

(6.2) (a) What does it mean for computation Q to emulate computation P? (b) What does it mean for computation U to be universal? (c) What does it mean to say that a computation P has an unsolvable halting problem? (d) What does Turing's Theorem say?

(6.2) (a) State Wolfram's PCE (Principle of Computational Equivalence), and my weaker form, the NUH (Natural Unsolvability Hypothesis). (b) Describe the steps by which we can deduce the NUH from the PCE. (c) Why is the PCE known to be untrue?

(6.3) (a) What does it mean to say that computation Q is faster than computation P? (b) What does it mean to say that computation P is unpredictable? (c) Give an example of a predictable computation and of a computation which is probably unpredictable.

(6.4) State the PNU (Principle of Natural Undecidability) and give three examples of statements about natural processes which might happen to be undecidable from existing scientific theories.

(6.5) What are my answers to (a) What is reality? (b) What is the meaning of life? and (six parts) (c) How can I be happy?