Dan Hervé

CSCD 350

Task 1

Outline:

Notion of System: light description of what the system does

3 Dots: 3 attributes that characterize the system

2 relationships: relations between 2 of the dots

At the end: discuss what the systems collectively have in common.

Systems:

Computer hardware: the mechanical components of a computing device

- Processor
- RAM
- Power Supply

1. Power supply powers the processor
2. Processor access data and stores results in RAM

Computer software: programmed instructions that dictate what a user can do with a computing device

- Operating System
- Code
- Independent Development Environment (IDE)

1. Operating System composed of code
2. Code written in IDE

Computer operating: tools used by the user to interact with a computing device

- Output
- Input
- User

1. User gives input
2. User reads output

Electrical: Energy used to power machinery based on the movement of electrons

- Electrons
- Wires
- Generator

1. Electrons travel through wires
2. Generators excite electrons

Mechanical: a composition of moving parts that produce an effect

- Parts
- Power
- Design

1. Parts conform to a design
2. Power allows parts to move

Biological: a composition of living cells that interact according to DNA instructions

- Cells
- DNA
- Reproduction

1. Cells beget other cells through reproduction
2. Cells act according to their DNA

Geological: a body consisting of minerals

- Igneous
- Sedimentary
- Minerals

1. Minerals under extreme temperature and pressure compose igneous rocks
2. Minerals compacted over time compose sedimentary rocks

Weather: the state of the atmosphere of a planet

- Clouds
- Rain
- Heat

1. Clouds produce rain
2. Heat causes precipitation of water which forms clouds

Communication: the sharing of information

- Statement
- Hearing
- Response

1. Statements are heard.
2. Heard statements are responded to.

Sensor: device used to detect some phenomenon

- Detector
- Phenomenon
- Output information

1. Detector detects some phenomenon
2. Phenomenon is reported as output information

Economic: The exchange of goods and services

- Currency
- Product
- Consumer

1. Currency is exchanged for product
2. Consumers buy or trade for products

Real-time: computing subject to strict time constraints

- Time constraint
- Input
- Output

1. Input processed into output
2. Output must be processed according to a set time constraint

What these systems have in common:

They are all composed of some parts (the what) which interact in a predetermined way (the how, when, and where). The science build around these systems attempt to understand them in order to interact with them in a way that increases the human good; furthermore, humans use this knowledge in order to make correlations with other systems to better understand them for the human good. For instance, understanding how a desired class of mineral is formed allows humans to replicate the process in order to artificially create similar minerals.