Advanced Placement Computer Science Principles Artificial Intelligence

What is a program?
What is intelligence?
Could a computer be intelligent?
Lesson 0-3

Objectives

Content: I will learn what an algorithm is and how it relates to programming and artificial intelligence.
Language: I will write an algorithm related to computer intelligence.
Social: I will participate in class activities and discussions

JOURNAL ENTRY

08/21/18

- I have an intelligent piece of paper.
- What could make a piece of paper intelligent?

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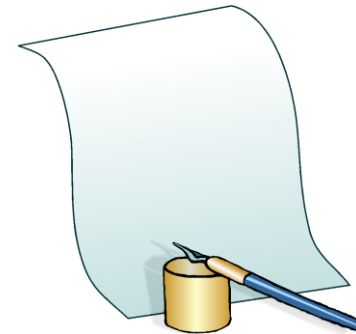Language: I will write an algorithm related to computer intelligence.
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IS INTELLIGENT PAPER POSSIBLE?

- What could make paper intelligent?

- Pair & share.

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THIS PAPER

- This paper may be more intelligent than anybody in the room.

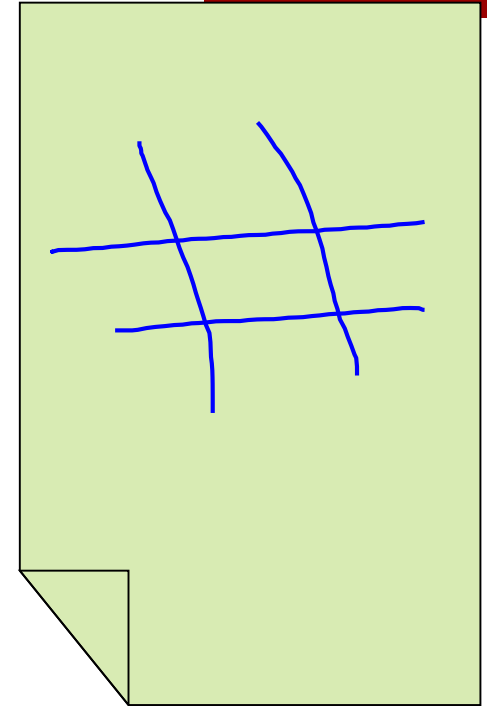- Does anybody believe that statement?

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WHAT CAN THIS PAPER DO?

- It has never lost a game.
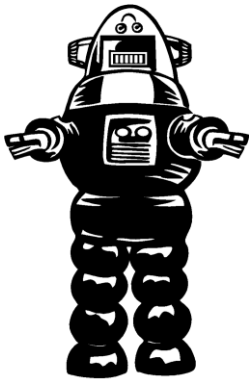- Unlike humans, it has perfect intelligence.

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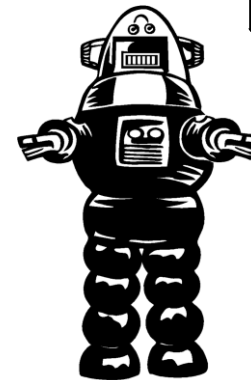
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LET'S PUT THE PAPER TO THE TEST

Human representative

Paper with peripheral assistance

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RULES OF THE GAME

1. The person with the paper reads the instruction
   (the person helping the paper is the paper's peripheral)

2. The paper's peripheral will follow instructions

3. The human representative will choose with their own best judgment

4. Take turns.

Win – lose – or draw?

0 Naught
X Cross

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POSSIBLE OUTCOMES

- ☒ Paper wins or draws.
- ☒ Humans give up. (They often do.)
- ☐ Try again and see if it's just luck.
- ☐ Humans cheat. (They sometimes do.)
- ☐ Humans cause an error. (It happens.)
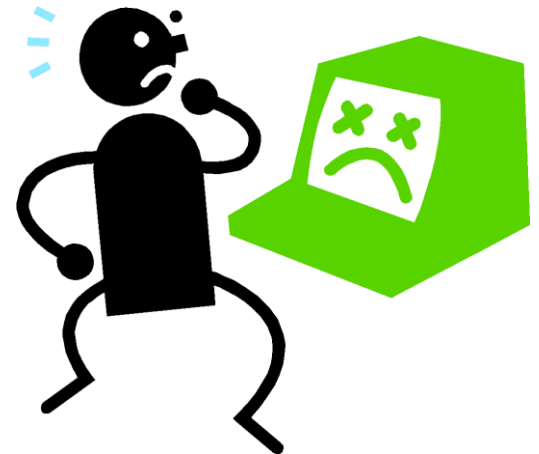- ☒ But, the paper WILL NOT LOSE!

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DO YOU BELIEVE IT NOW?

- ☒ Now, who believes that the paper is intelligent?
- ☒ It did demonstrate intelligent behavior.
- ☒ Where did the intelligence come from?

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THE EXPLANATION

☐ It is essentially a computer program.

☒ Human programmers write the instructions.

☒ Instructions are written in a language that humans can understand.

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EXTENSIONS

☒ What if the paper goes 2nd instead of 1st?

☒ What if one paper plays another paper?

☒ Can you devise perfect instructions that will never lose
whether you go 1st or 2nd?
(A plan to solve a problem is an algorithm.)

The frame problem

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HOW TO CREATE THE PERFECT PLAN

☒ Can you be sure you will win every game without trying them all?

☒ How many possible games are there?

☒ How does symmetry reduce the number of possible games?

☒ This is the basis for artificial intelligence game playing programs. They figure out all the moves for themselves and determine the outcomes.

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VOCABULARY

- Computer program: a set of instructions that runs on a computer
  - A program uses **input**, information that goes into the program from a person, a sensor, or another machine.
  - A program uses **output.** The way it communicates its results: printing, talking, blinking lights, etc.
  - A program is processed by a **processor** (CPU). Computers can have multiple processors.
  - A program can be saved to use again in computer **memory.**
- Artificial intelligence are programs that learn or can act human.
- Peripheral is a device connected to a computer.
- Algorithm is a step by step plan to solve a problem

Add these to your journal.

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TRY IT IN PYTHON

☐ This is a Tic-Tac-Toe game written in Python. The computer follows certain steps to try and win against the player.

☐ http://py3.codeskulptor.org/

☒ Play a few rounds against the computer.
☒ Can you figure out how to beat it?
☒ How could the computer have been "smarter" in its strategy?

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HOMEWORK

- Read chapter 1 – *Blown To Bits*

- Be ready to discuss the next time we are in class

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