



Lesson Preview

- What is knowledge-based artificial intelligence?
- How does it fit into the rest of artificial intelligence?
- What can I expect to learn from this course?
- What is the structure of this course?

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What are some things Watson must be able to do to
participate in Jeopardy?
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Read the clue

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Search its knowledge base

Decide on an answer

Properly phrase that answer

Fundamental Conundrums of Artificial Intelligence

- Intelligent agents have limited resources.
- Computation is local, but problems have global constraints.
- Logic is deductive, but many problems are not.
- The world is dynamic, but knowledge is limited.
- Problem solving, reasoning, and learning are complex, but explanation and justification are even more complex.

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Characteristics of AI Problems

- Knowledge often arrives incrementally.
- Problems exhibit recurring patterns.
- Problems have multiple levels of granularity.
- Many problems are computationally intractable.
- The world is dynamic, but knowledge of the world is static.
- The world is open-ended, but knowledge is limited.

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Characteristics of AI Agents

- Agents have limited computing power.
- Agents have limited sensors.
- Agents have limited attention.
- Computational logic is fundamentally deductive.
- AI agents' knowledge is incomplete relative to the world.

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Which of these are AI problems?

- o Answering questions on Jeopardy.
- o Configuring the dimensions for the basement of a new house.
- o Tying shoelaces.
- o Deciding on a route to a new destination.
- o Making sense of a news broadcast.
- o Designing a robot that walks on water.
- o Establishing whether a flower pot can be used as a drinking cup.
- o Deciding whether or not a new animal is a bird.

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Deliberation 审议

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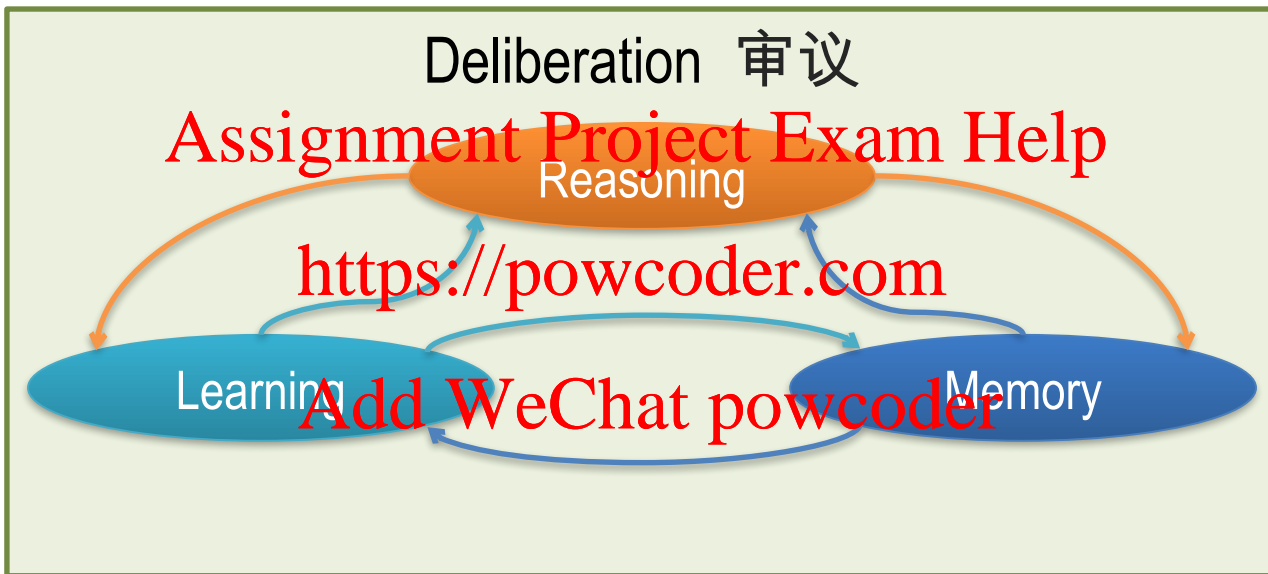
Reasoning

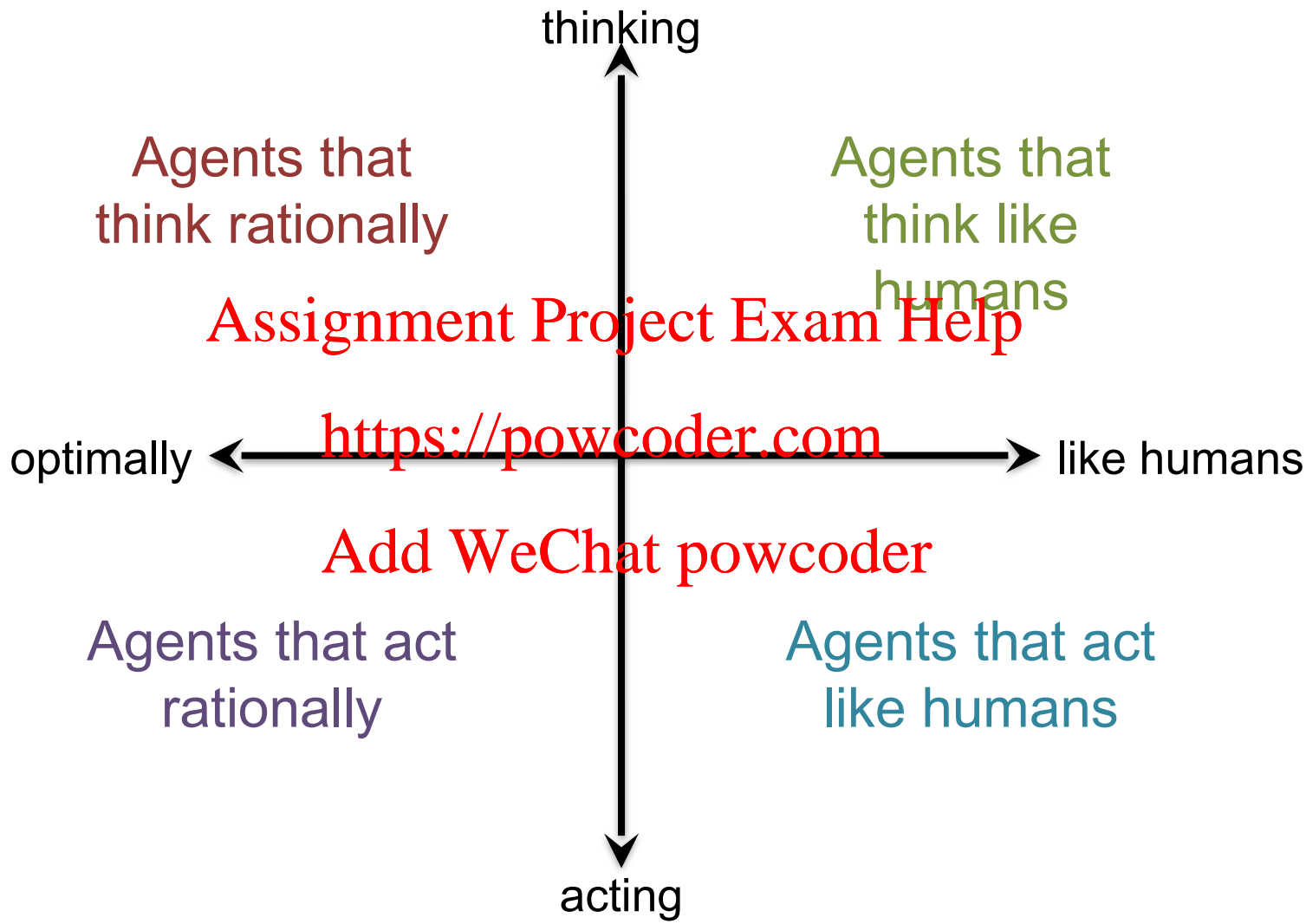
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Learning

Memory

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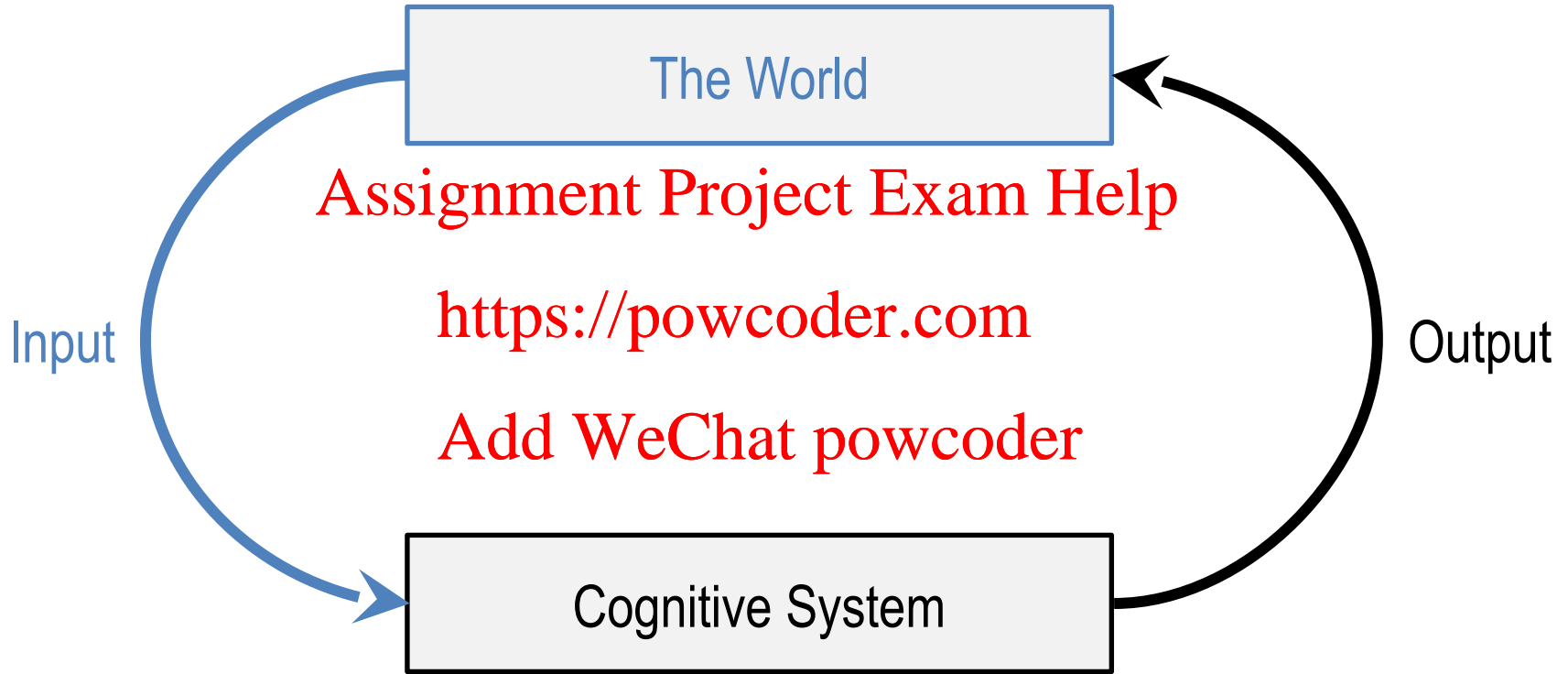


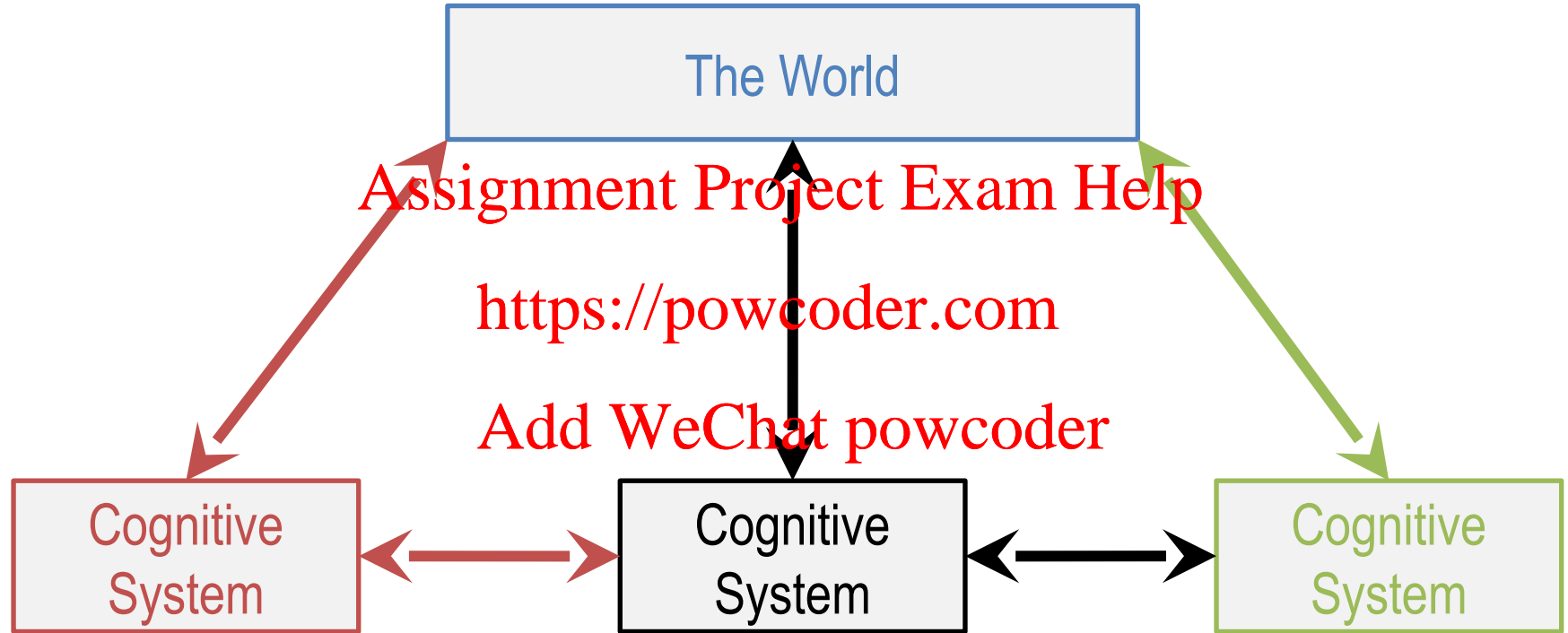
What are cognitive systems?

Cognitive: dealing with human-like intelligence.

Systems: multiple interacting components such as learning, reasoning, and memory.

Cognitive Systems: Systems that exhibit human-like intelligence through processes like learning, reasoning, and memory.





Cognitive System

Metacognition

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Reasoning

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Learning

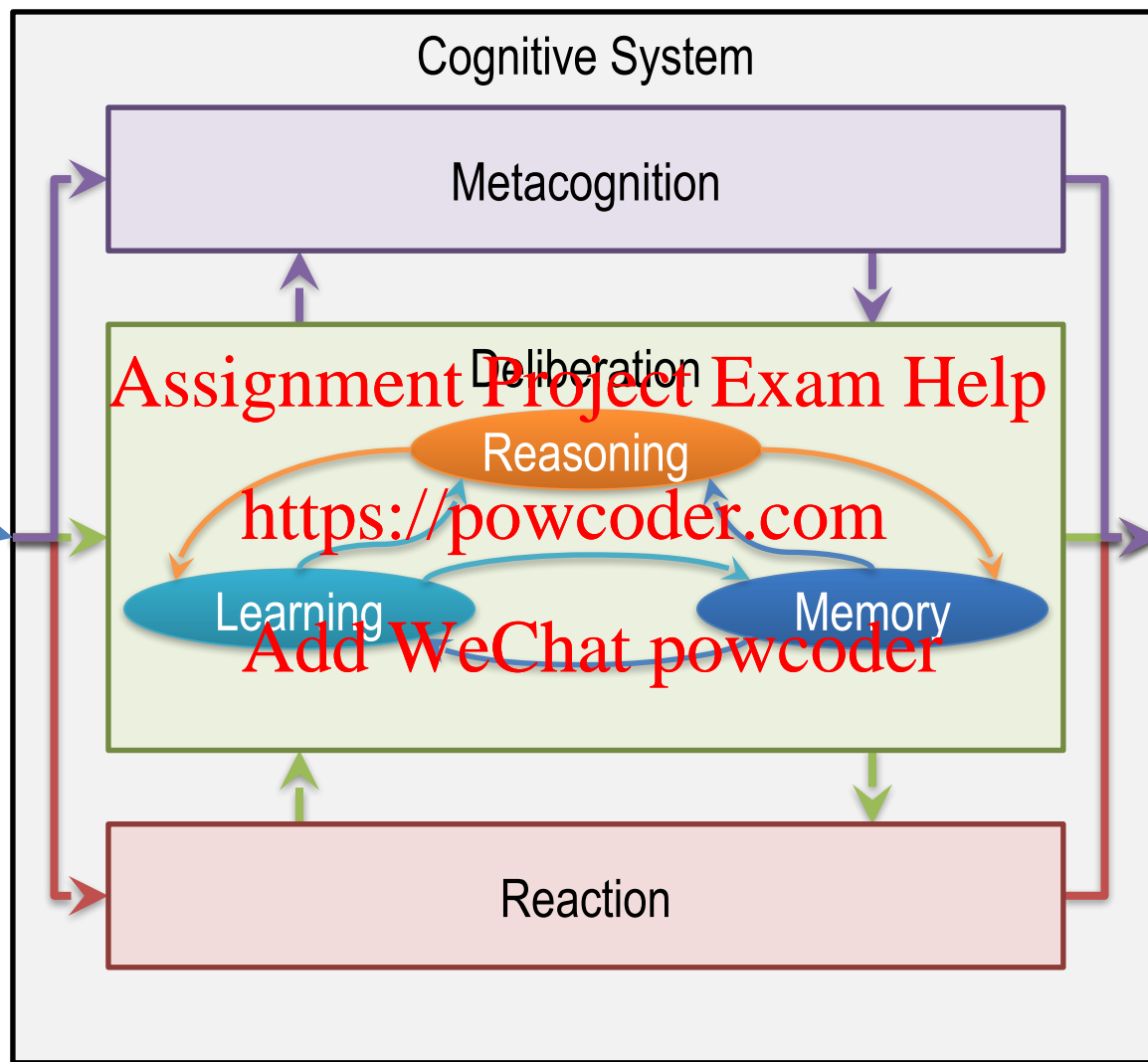
Memory

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Reaction

Input

Output





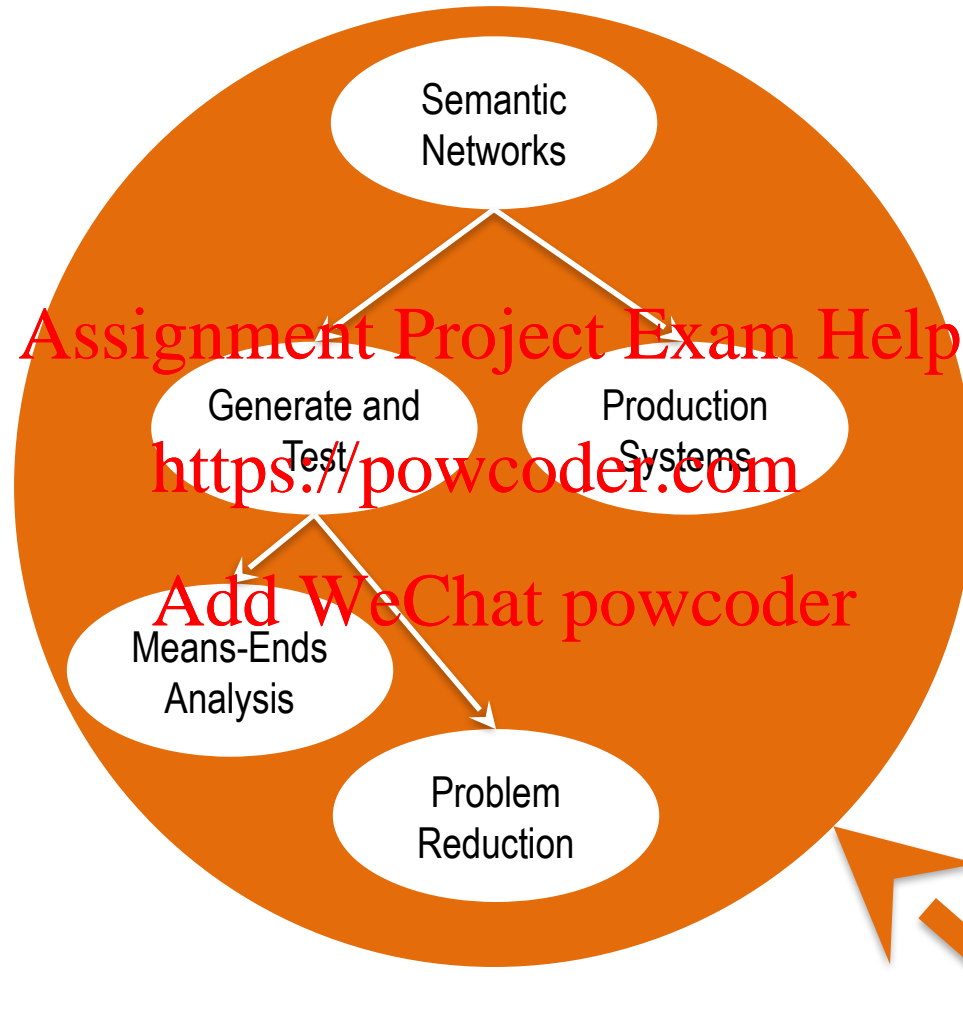
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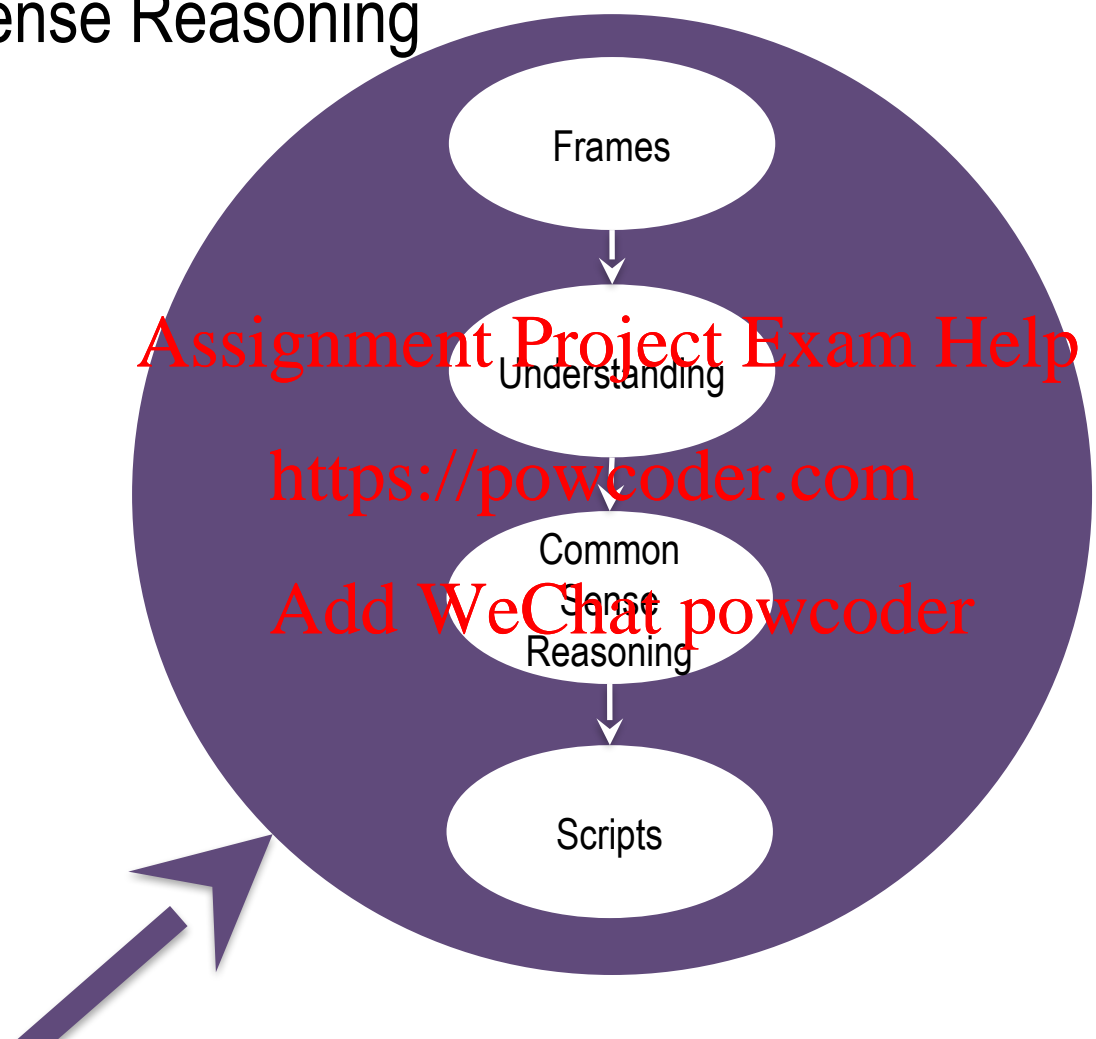
Fundamentals



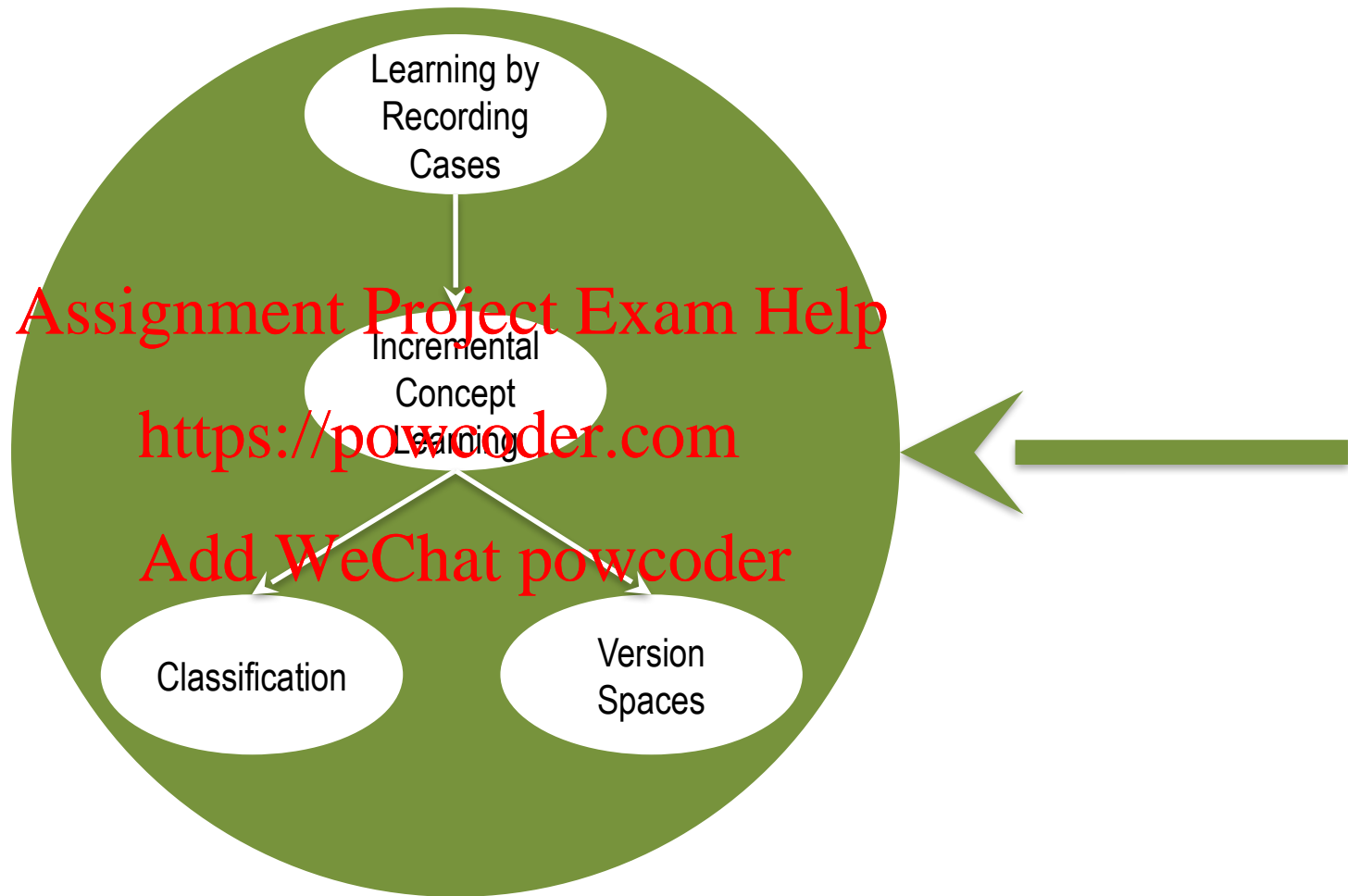
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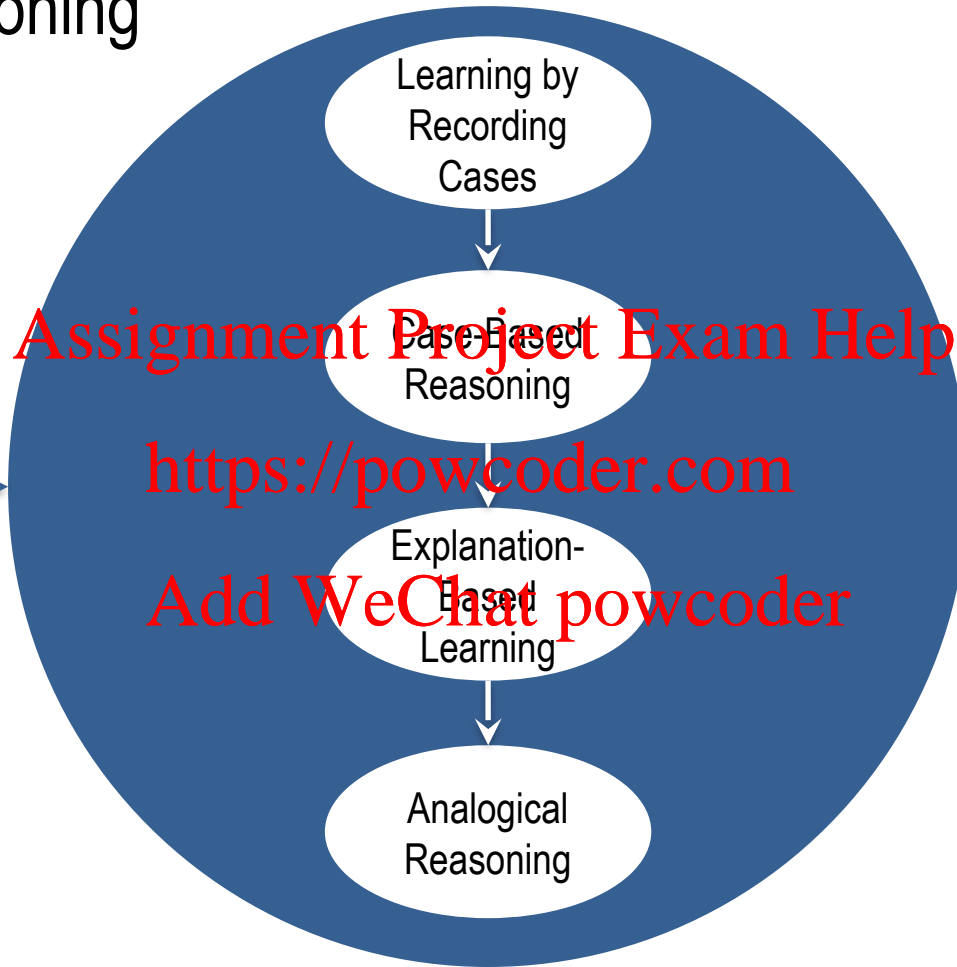
Common Sense Reasoning



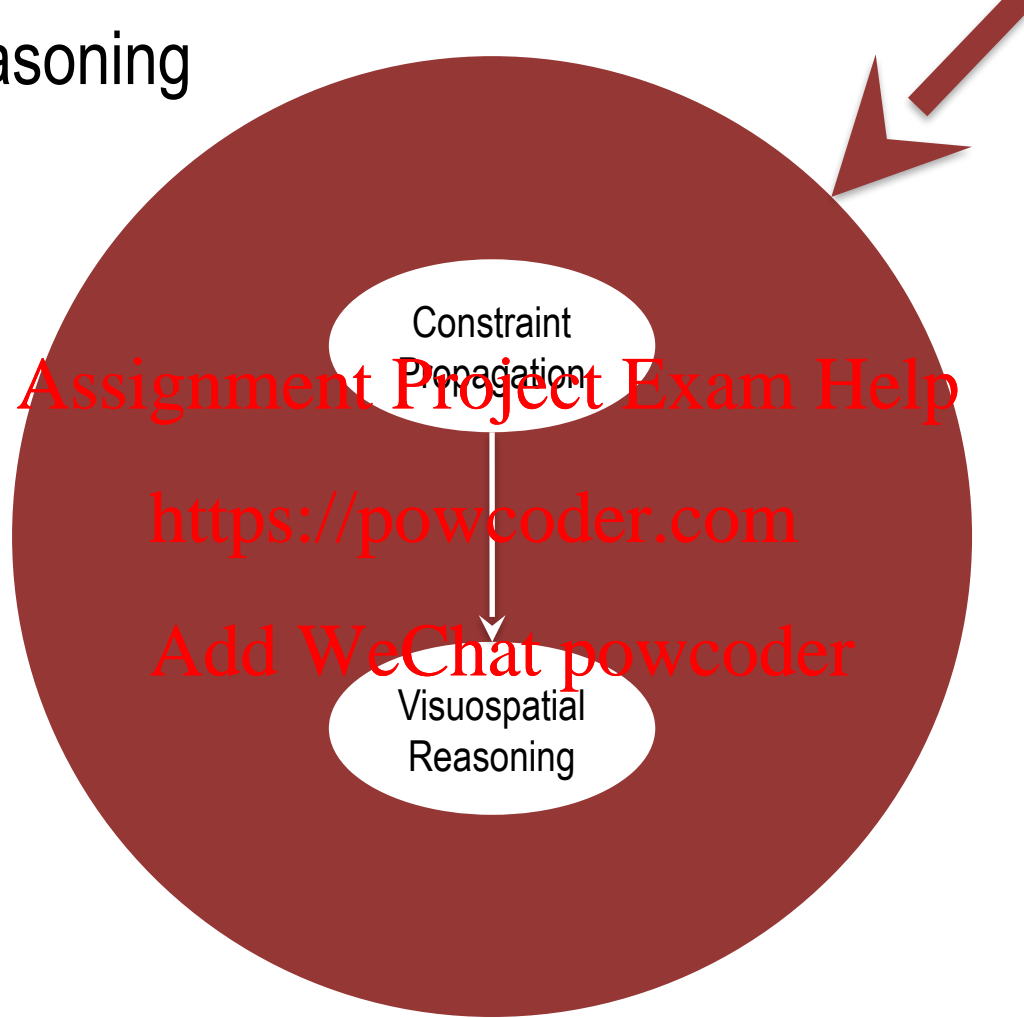
Learning



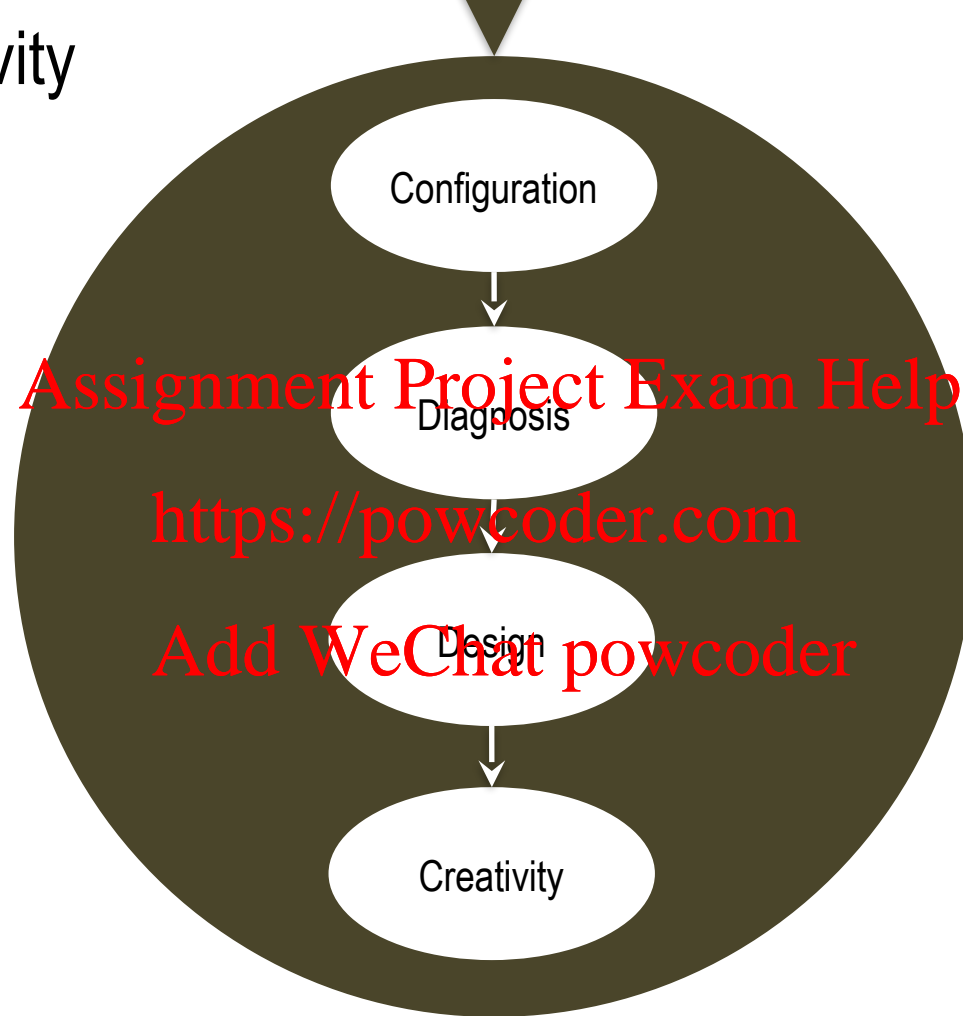
Anallogical Reasoning



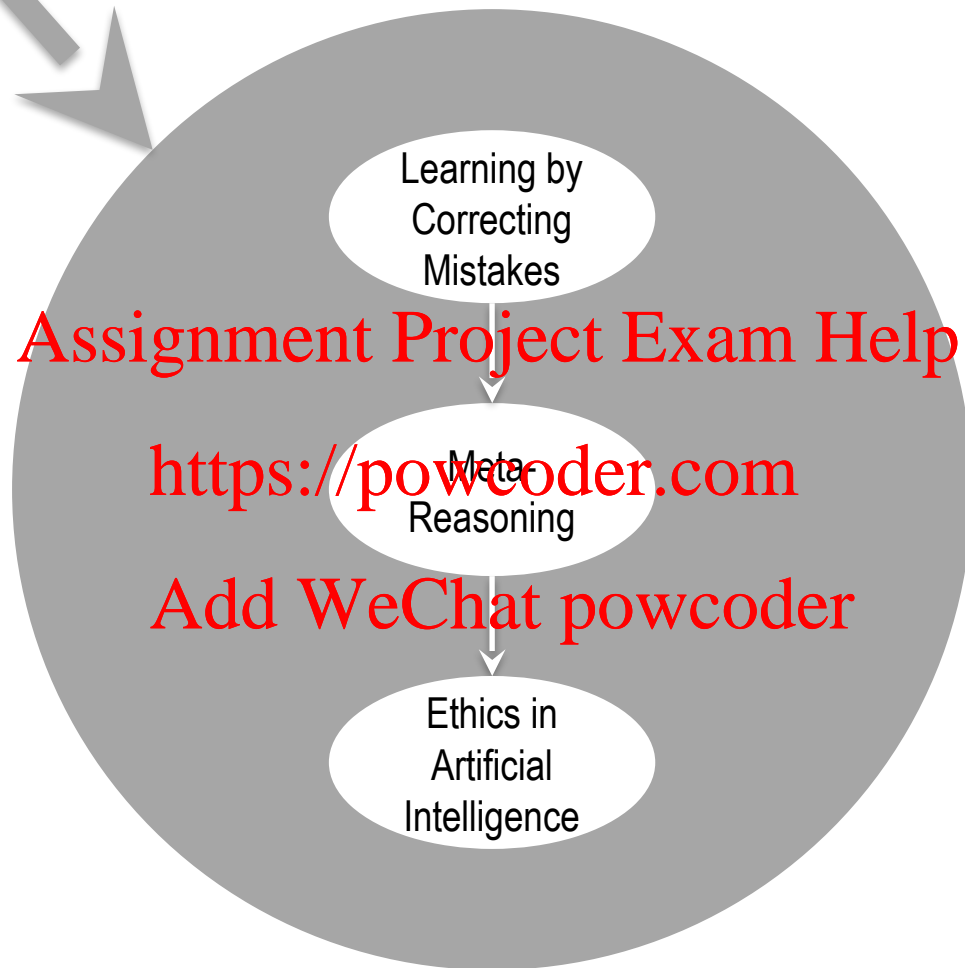
Visuospatial Reasoning

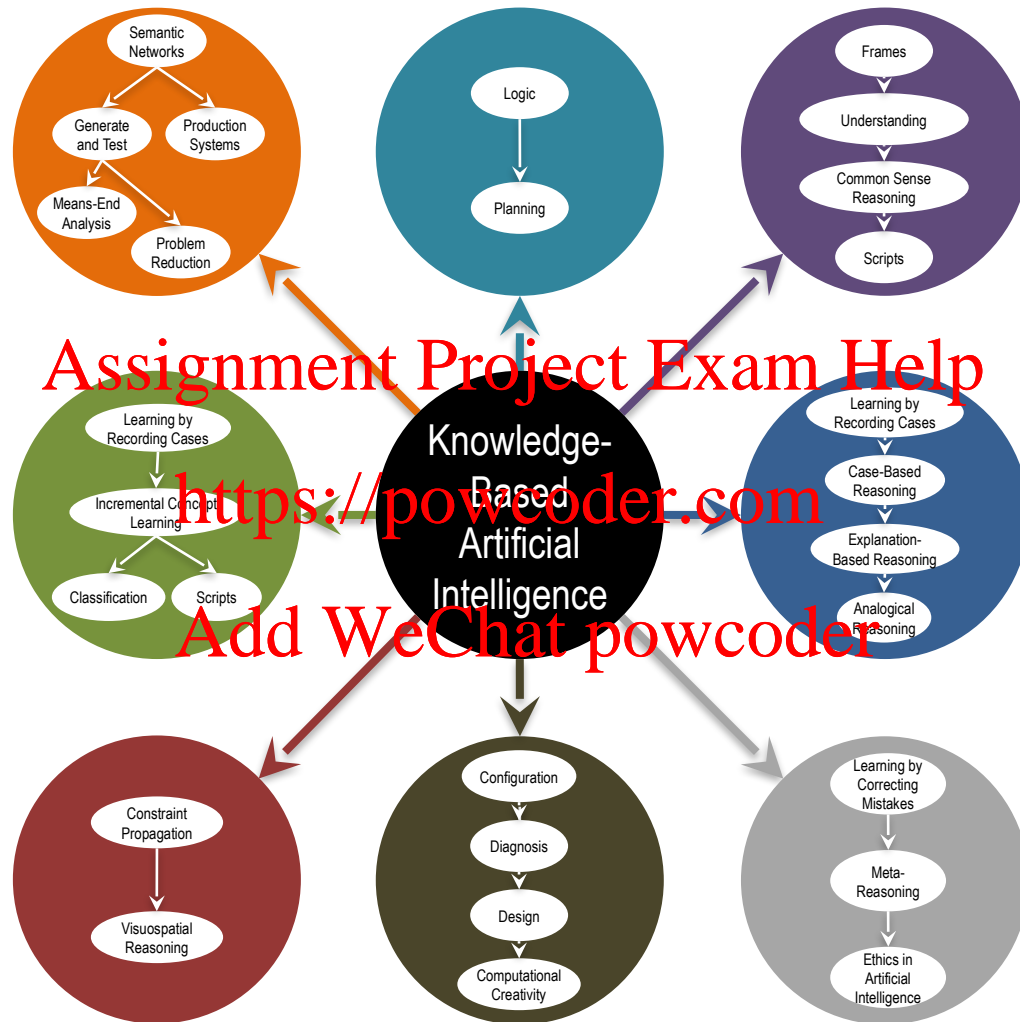


Design & Creativity



Metacognition





To recap...

- Conundrums and characteristics
- Four schools of AI
- What is KBAI? **Assignment Project Exam Help**
- Cognitive Systems **<https://powcoder.com>**
- Topics in AI **Add WeChat powcoder**