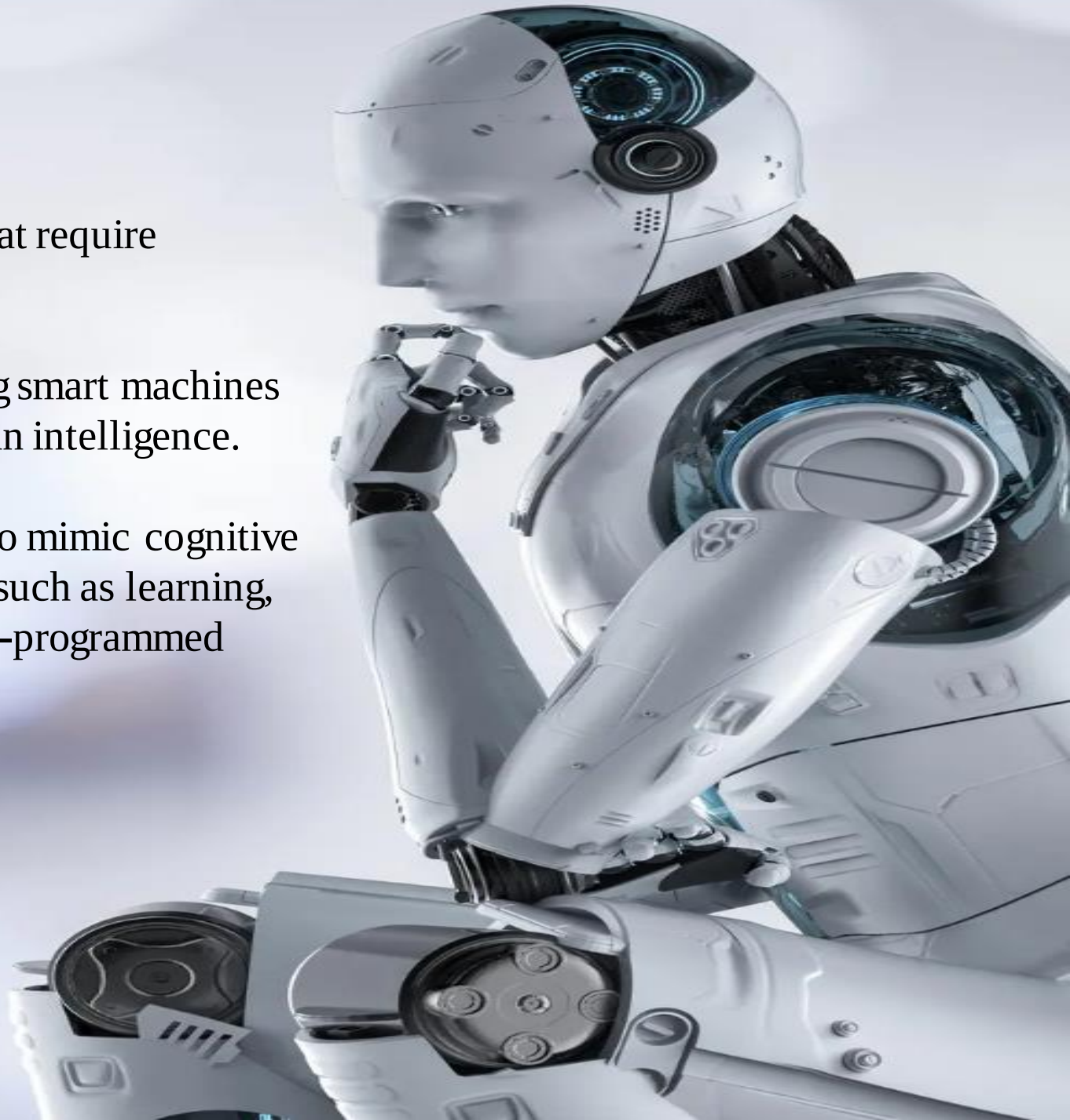
Introduction to Artificial Intelligence

What is Artificial Intelligence?

-The art of creating machines that perform functions that require intelligence when performed by people.

-A branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence.

-Is the science which allows machines (or computers) to mimic cognitive functions that humans associate with the human mind, such as learning, problem solving and decision making specially for non-programmed situation.



Application of AI:

1. Machine Learning :

- Reinforcement Learning
- Deep learning
- Supervised learning
- Un supervised learning

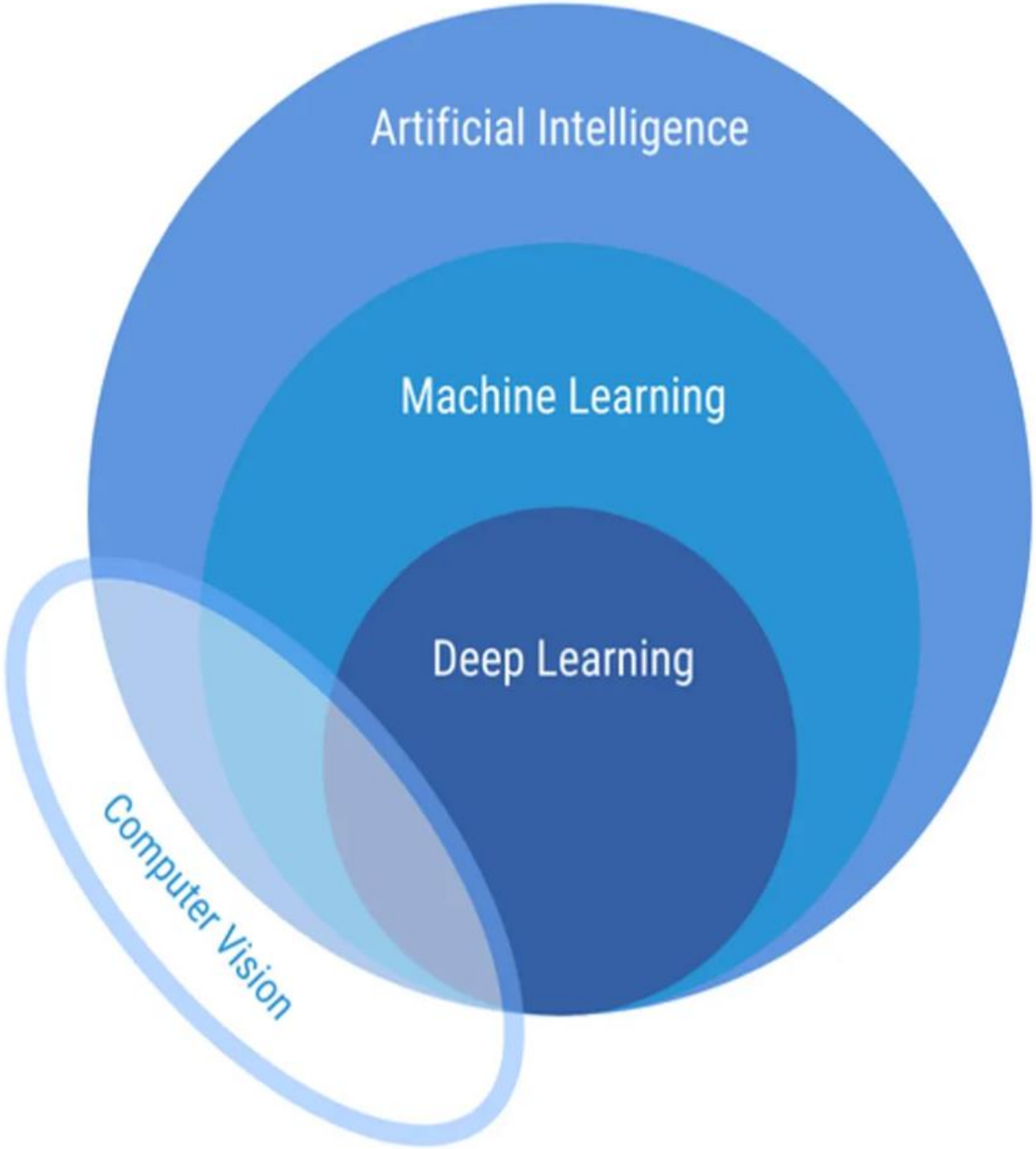
2. Natural Language Processing:

- Context extraction.
- Classification.
- Machine translation.
- Question answering.
- Text generation.

3. Speech:

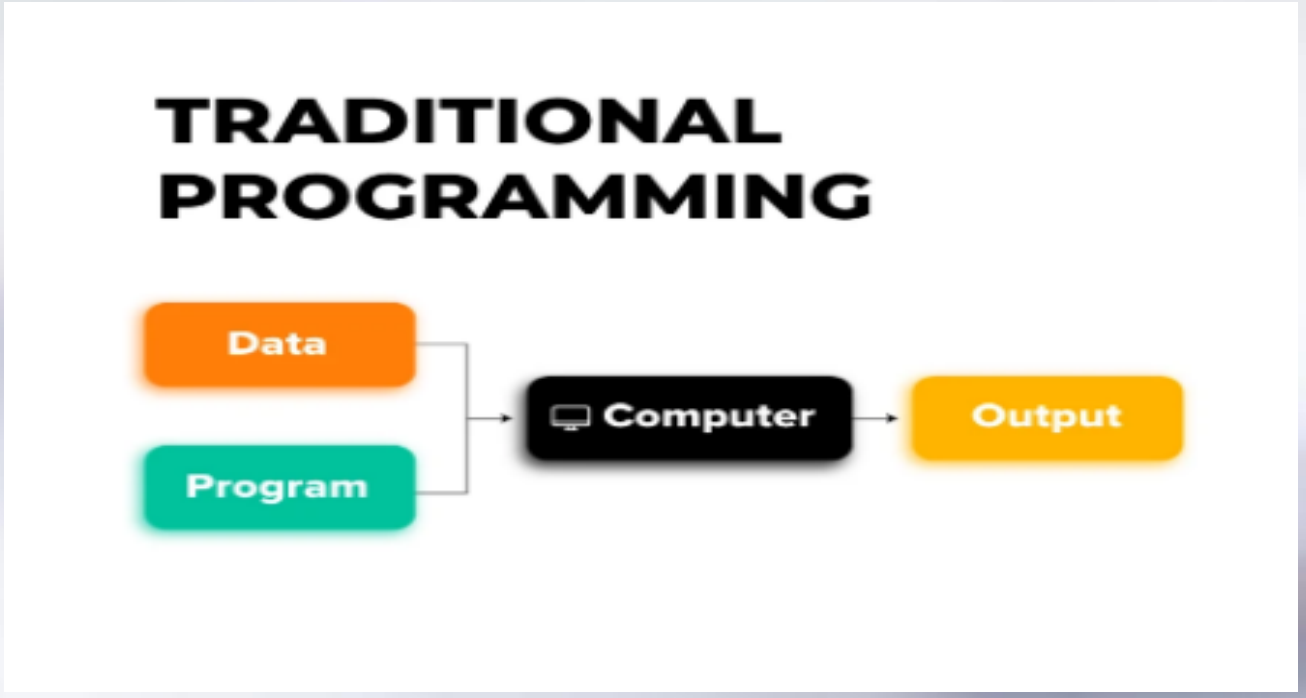
- Text to speech.
- Speech to text.

4. Robotics:



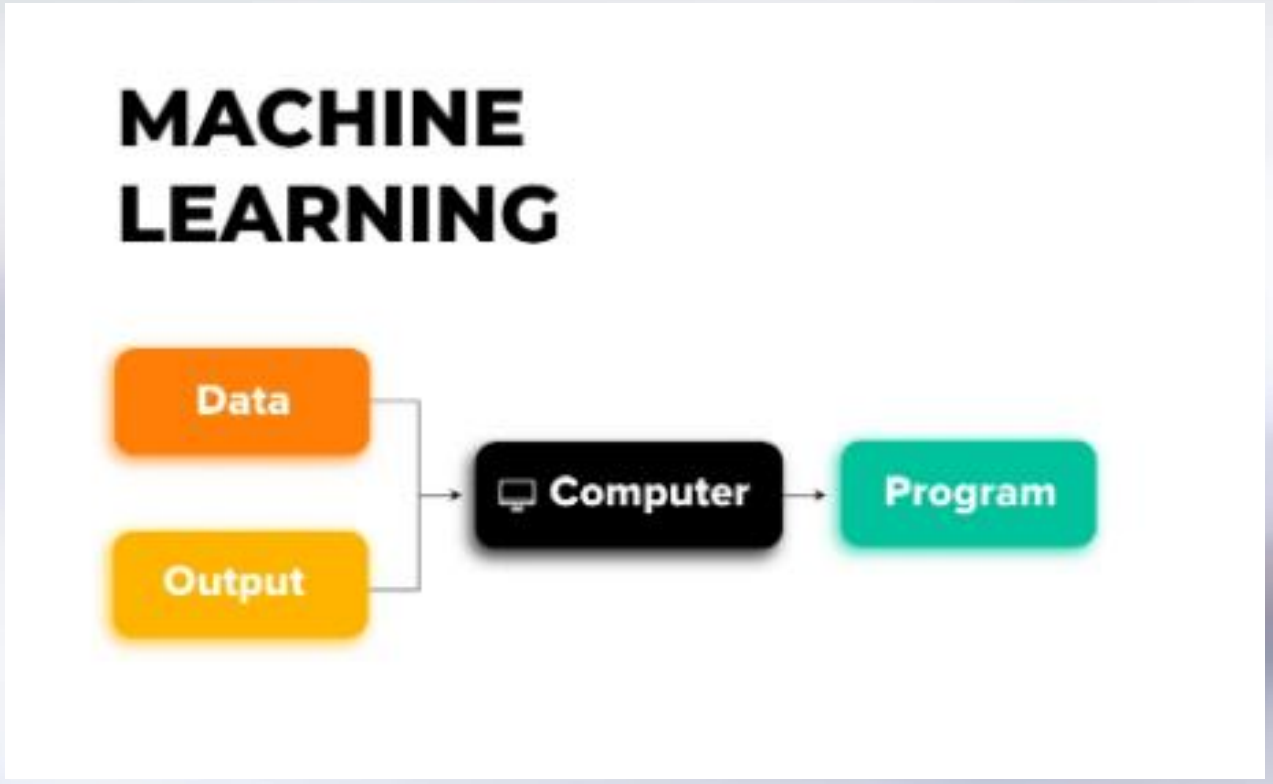
Machine Learning or traditional learning !?

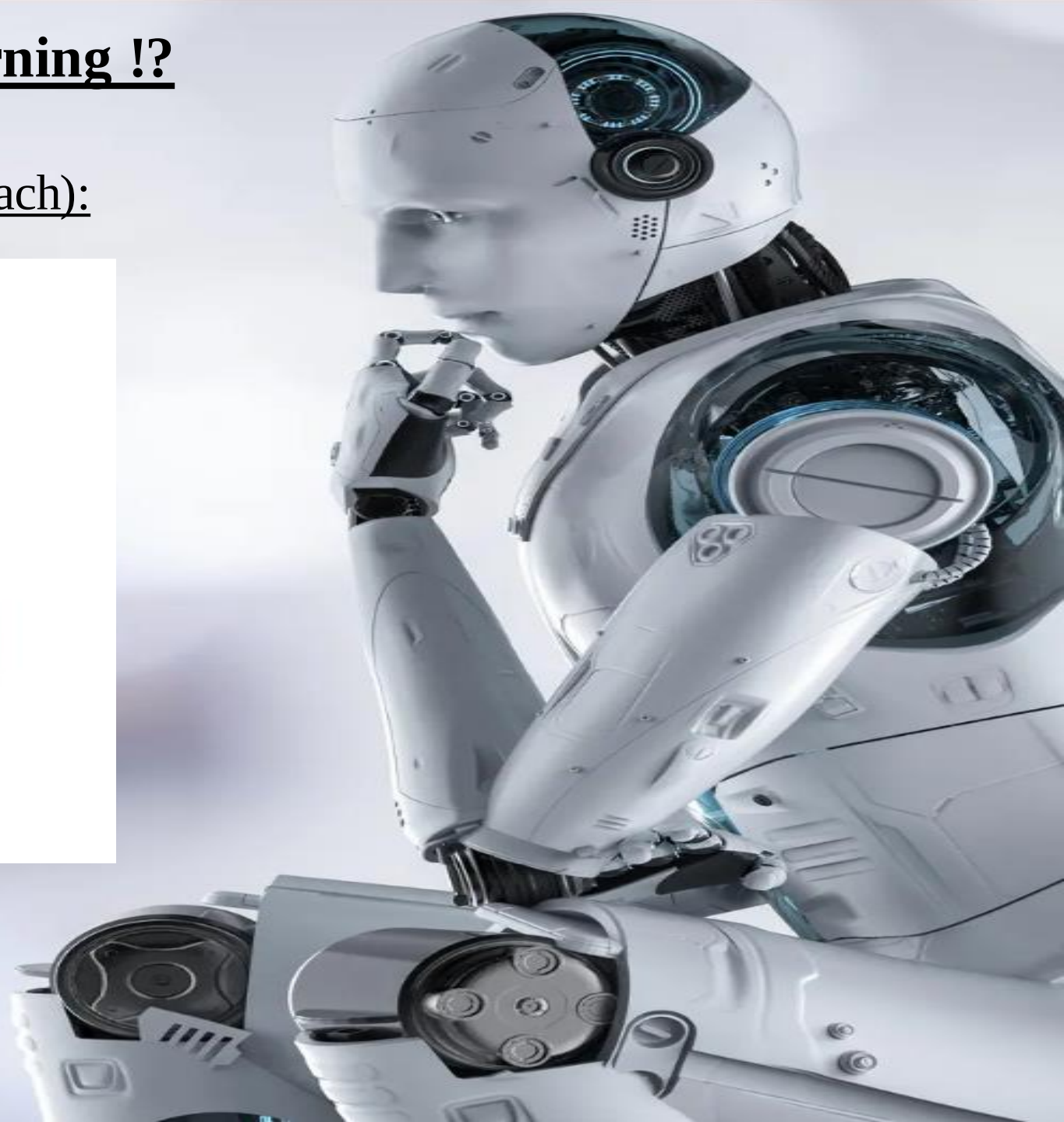
1- Traditional Programming (rule-based approach):



Machine Learning or traditional learning !?

1- Machine Learning(experience-based approach):





Why python in Artificial Intelligence?

- Free and open source.
- Interpreted.
- Interactive.
- Error handling.
- Debugging is easy (built-in).
- Cross platform.
- Expressive.
- Oop.
- AI packages (pandas, Numpy).
- Integrated.
- Memory Management (Garbage Collection).
- Machine learning & Data science.
- AI and Robots in mars.

Python Syntax

Python Syntax :

Execute Python syntax:

```
>>> print("Hello, World!")
Hello, World!
```

Python uses indentation to indicate a block of code.

Python Syntax :

Comment:

It is very useful for you and your team.

- Information about the file.
- Information about the code.
- Who created the file, why and when

```
#This is a comment
>>>print("Hello, World!")
```

Python Syntax :

Data in Python:

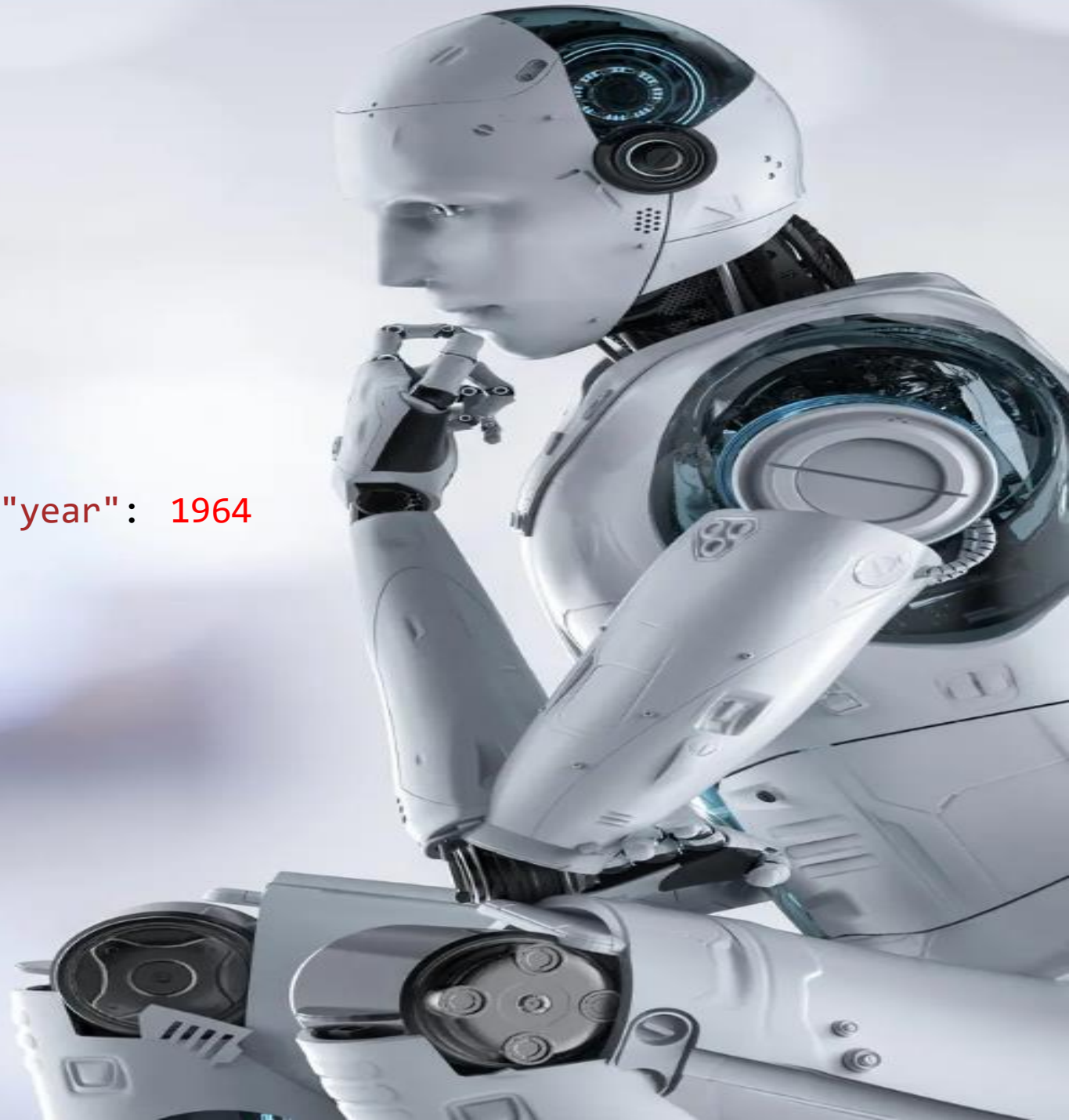
Our Apps contains Code + Data.

- Code is the lines you write to manage and deal with data.
- To structure the data we need to categorize [Num , String, Booleans].
- Data is stored on computer memory.
- We use variable to refer to this data.
- Variables are not containing the data, it’s only refer to location on Memory.
- Code is using the data to perform operation [Add, Edit, Delete].

Python Syntax :

Data Types in Python:

```
>>>print(type(“Hello python"))  #str
>>>print(type(5))                #int
>>>print(type(10.5958))          #float
>>>print(type([1,2,3,4,5]))      #List
>>>print(type((1,2,3,4)))        #tuple
>>>print(type({"brand":"Ford","model":"Mustang","year":  1964
}))                             #dic
>>>print(type(2==2))             #bool
```



Python Syntax :

Variables in Python:

```
>>>myVariable = “my value”
>>>print(myVariable)
```

```
>>>name=“Hello world”          #single word => Normal
>>>myName=“Hello world”       #Two words=>camelCase
>>>my_name=“Hello world”     #Twowords=>snake_case
```

Python Syntax :

Variables in Python:

#Reserved words:
```
>>>help('keywords')
```

```
>>>a, b, c = 1, 2, 3.
>>>print(a)
>>>print(b)
>>>print(c)
```

Variables do not need to be declared with any particular *type*, and can even change type after they have been set.

```
>>>x = 4       # x is of type int
x = "Sally"     # x is now of type str
print(x)
```

Python Syntax :

Concatenation in Python:

```
>>>msg1="Hello"
>>>Msg2="World"
>>>print(msg1+ " "+Msg2)
```

Can't concatenate number to string.

```
>>>print ("Hello" + 1)          #Error
```