

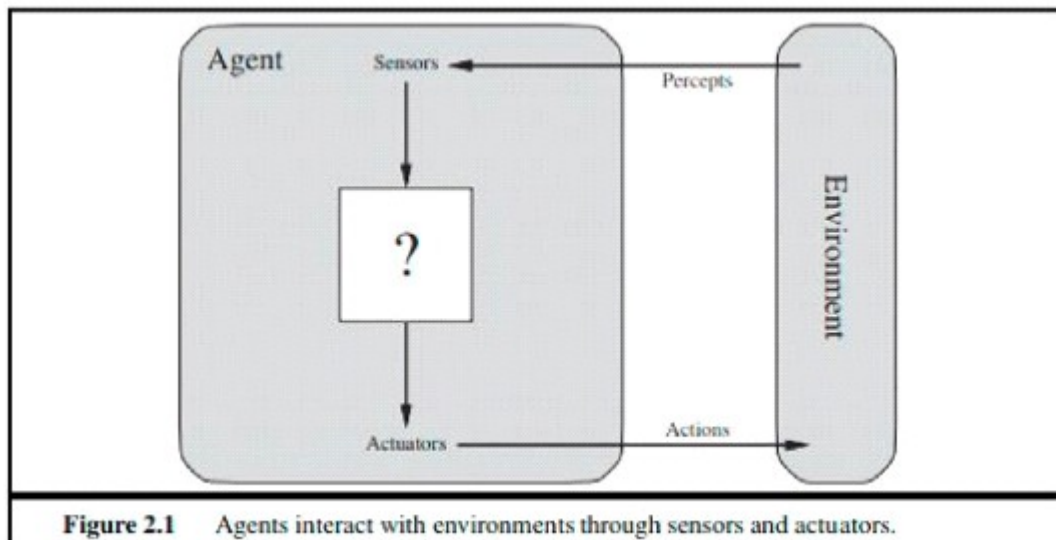
Artificial Intelligence(AI)

section2

- 1) What is agent?
- 2) Applications of agent in different fields?
- 3) Vacuum_cleaner agent?
- 4) Rational agent ,, agent ?
- 5) Variables in python ?

1) What is agent ?

Agent : is anything that senses environment using sensors and act upon that environment through its actuators.



sensor: is the part that receives input from the environment.

actuators: is the part that helps interact with the environment.

percept: we use the term perception to refer to an agent's perceptual input at any given moment.

percept sequence: agent's percept sequence is the complete history of everything the agent has ever perceived.

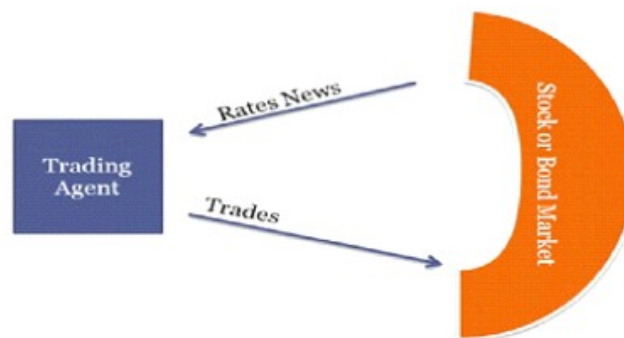
agent function(control policy function): is a set of condition-rules based on it the agent can make decision"action".

2) Applications of agent in different fields ?

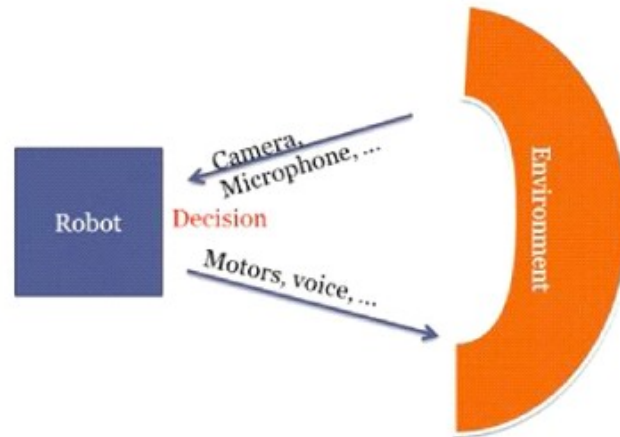
- AI has successfully been used in ?

- ☐ Finance
- ☐ Robotics
- ☐ Games
- ☐ Medicine
- ☐ The web

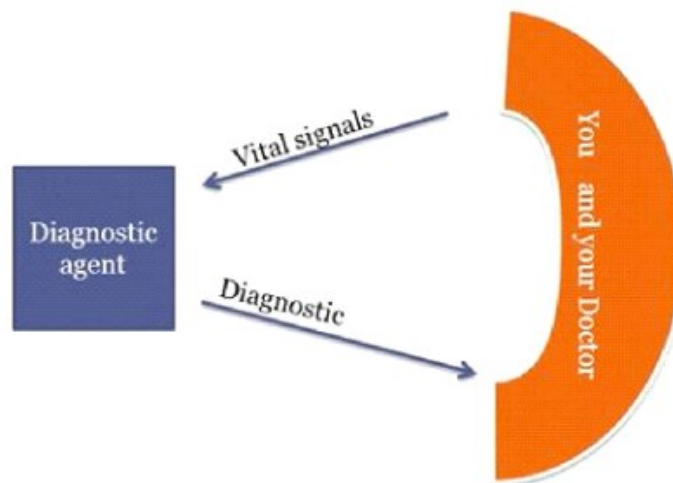
AI in Finance



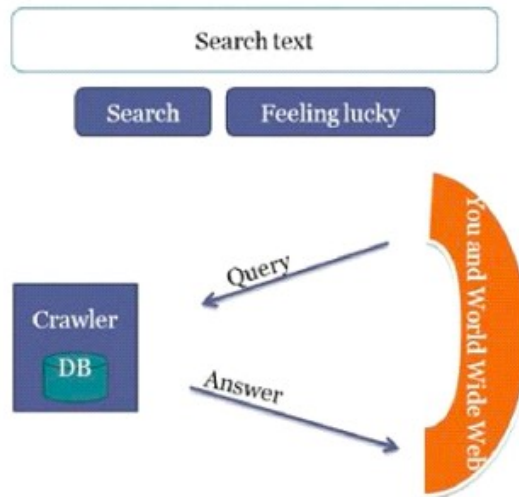
AI in Robotics



AI in Medicine



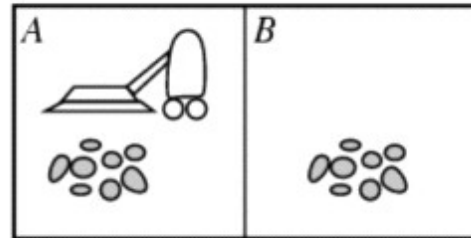
AI in the WEB



3) Vacuum_cleaner agent ?

Example: Vacuum-Agent

- **Percepts:**
Location and status,
e.g., [A,Dirty]
- **Actions:**
Left, Right, Suck, NoOp



function Vacuum-Agent([location,status]) returns an **action**

- if status = Dirty then return Suck
- else if location = A then return Right
- else if location = B then return Left

4) performance measure,,Rational agent ?

Performance measure: An objective criterion (“utility function”) for success of an agent's behavior.

Performance measures of a vacuum-cleaner agent:

amount of dirt cleaned up, amount of time taken, amount of electricity consumed, level of noise generated, etc.

Performance measures self-driving car: time to reach destination (minimize), safety, predictability of behavior for other agents, reliability, etc.

Performance measure of game-playing agent:

win/loss percentage (maximize), robustness, unpredictability (to “confuse” opponent), etc.

Rational Agent: For each possible percept sequence, a rational agent should select an action that maximizes its performance measure (in expectation) given the evidence provided by the percept sequence and whatever built in knowledge the agent has.

rationality: do the right thing .

-maximize expected performance

-information gathering, exploration, learning.

5) variables in python ?

some important information:-

Run == F5

space in the first of line "error"

python is case sensitive

types of variables:-

- string,float,integer,boolean,complex,list,tuple, set,dictionary

5.1) number variables(integer,float):-

- to define number variable

```
x=5
y=5.5
print(x,y)
```

- to convert from datatype to another

```
x=12
y=3
x1=str(x)
y2=bool(y)
x2=complex(x,y)
print(x1,x2,y2,type(x1),type(x2),type(y2))
print(x2.real,x2.imag)
```

```
x=10.5
print(int(x))
print(type(x))
```

- arithmetic operation on number variable :-

```
x=10
y=4
print(x+y , x-y , x*y ,x/y ,x**y ,x%y , x//y)
```


- math library :- is a set of methods that you can invoke them in arithmetic operations

```
import math
import math as ms
from math import*
from math import sin,cos
```

```
import math as ms
a=ms.factorial(6)
print(a)
print(ms.pow(3,5))
print(ms.sin(60))
print(ms.log10(100))
print(ms.pi)
print(ms.e)
```

5.2) string variable:-

- to define string variable

```
name="ali"
print(name)
```

- to access any character in string, last index is not included

```
a='artificial intelligence'
print(a[5])
print(a[-1])
print(a[4:12])
print(a[:5])
print(a[2:])
print(a[1:10:2])
print(a[::2])
print(a[:10:4])
print(a[-1:4:-1])
print(a[::-1])
```

- to repeat string or character in string

```
a='artificial intelligence'
print(a*3)
print(a[2]*3)
```

- to split string ,depending on certain symbols,symbols "deleted" **split**

```
a='artificial\n intelligence'
print(a.split())
print(a.split('i'))
print(a.split('a'))
print(a.splitlines())
```

- to split string depending on certain symbols ,symbols "included" **partition**,must contain argument

```
a='artificial intelligence'
print(a.partition(' '))
print(a.partition('i'))
```

- to search for word or character in string **find**,return index of word or character if character not found return -1

```
a='artificial intelligence'
print(a.find("artificial"))
print(a.find('i'))
```

- to return index through character,**index**,if character not found return error

```
a='artificial intelligence'  
print(a.index("i"))
```

- to replace character with another, **replace**

```
a='artificial intelligence'  
print(a.replace('a', 'z'))
```

- To find out how many times a letter or character is repeated, **count**

```
a='artificial intelligence'  
print(a.count("artificial"))  
print(a.count("e"))
```

- to display all characters capital **upper**
- to display all character small **lower**
- to display the first character of statement capital **capitalize**
- to traverse the state of character **swapCase**
- to display the first character from each word capital **title**

```
a='artificial intelligence'  
print(a.upper())  
print(a.lower())  
print(a.capitalize())  
print(a.swapcase())  
print(a.title())
```

5.3) boolean variable:-

```
a=True  
x=False  
print(a,x)
```