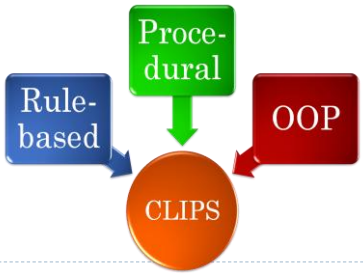
CLIPS

C LANGUAGE INTEGRATED PRODUCTION SYSTEM

Lecture# 1
Expert System lab Work

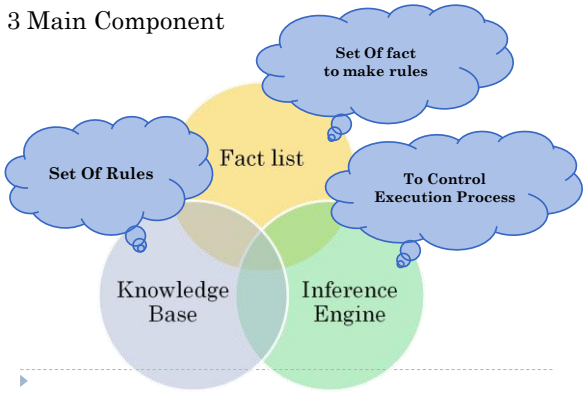
INTRODUCTION

Representation and Reasoning Knowledge



Environment in CLIPS

3 Main Component



NOTATION

- Like LISP programming Language signed by double colon "()".

- e.g :

```
(exit)
```

- **Case Sensitive**

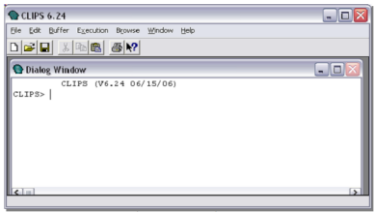
DATA TYPE

- There are 7 data type called as CLIPS *primitive data type* :

1. **Float**
2. **Integer**
3. **Symbol**
4. **String**
5. **external address**
6. **instance name**
7. **instance address.**

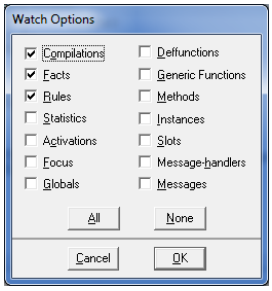
START WITH CLIPS

- By Default interface of CLIPS is *command promt* as interpreter



Mengaktifkan Watch Option

Execution - Watch



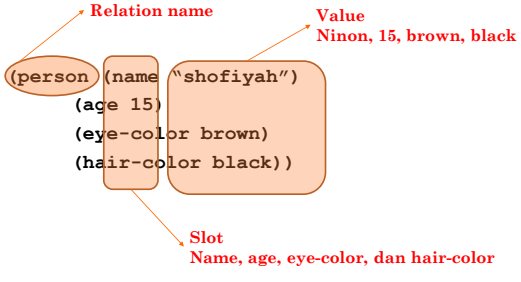
Tujan

Proses Masuk dan Keluar Fakta ke/dari fact-list dapat terlihat

FACTS

- To solve the problem in expert system, we must have data will became a resource of knowledge.
- Data or Information in CLIPS called as set of facts.
- The facts consist of **relation-name** and followed by **slot**

EXAMPLE



DEFTEMPLATE CONSTRUCTION

- Before the facts is made, CLIPS must know suitable slot for being defined to a relation name
- Mechanisme to create slot is deftemplate construction
- Deftemplate like format of the record in C or Pascal programming language.

SYNTAX

- Deftemplate syntax

```
(deftemplate <relation-name> [optional-
  coment] <slot-definition>*)
```

- Syntax of description `<slot-definition>`

```
(slot <slot-name> | (multislot <slot-name>)
```

example

- Deftemplate Person

```
(deftemplate person
    (slot name)
    (slot age)
    (slot eye-color)
    (slot hair-color))
```

- *Deftemplate-facts are the fact* with format deftemplate
- *ordered- facts are* the fact without format deftemplete

ADD, MODIFICATION, DUPLICATE AND REMOVE FACTS

- Adding Fact

  Facts can be added to working memory with command assert

- Syntax

```
(assert <fact>)
```

Example

```
CLIPS>
(deftemplate person
(slot name)
(slot age)
(slot eye-color)
(slot hair-color)) <ENTER>
CLIPS>
(assert (person (name "shofiyyah")
(age 15)
(eye-color brown)
(hair-color black))) <ENTER>
<fact-0>
```

EXAMPLE

- To appear set of fact used command (facts).

Identifier dari fakta yg kita miliki

```
CLIPS>(facts)
f-0 (person (name "shofiyyah")(age
  30)(eye-color brown)
(hair-color black))

For a total of 1 fact
```

CON'T

- We can use command assert .

```
(assert (person (name "aisyah")
(age 17)
(eye-color blue)
(hair-color brown))) <ENTER>
<Fact-1>
```

- Ketik perintah : **(facts)**

ADITION, MODIFICATION, DUPLICATION AND DELETION FACTS

- Modification Facts

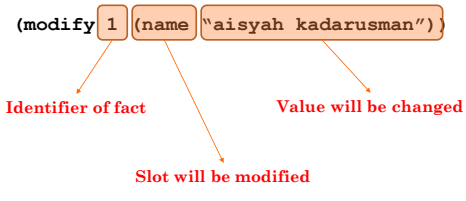
  Use command (modify) if facts have been in working memory

- Genaral Format :

  ```
  (modify <fact-index> <slot-modifier>)
  ```

Example

- Name Modification



example

- Result of Modofication

```
CLIPS> (modify 1 (name "ade trisetyo"))
<Fact-2>
CLIPS> (facts)
f-0     (person (name "ninon") (age 15) (eye-color brown) (hair-color black))
f-2     (person (name "ade trisetyo") (age 17) (eye-color pink) (hair-color black))
For a total of 2 facts.
```

- Duplication facts
  Use Command **(duplicate)**

- General Format :

```
(duplicate <fact-index> <slot-duplicate>)
```

DUPLICATION FACTS

Example

```
(duplicate 0 (age 12))
```

Fakta apa yang diduplikasi ?
Berapa jumlah fakta di fact-list ?

DELETION FACTS

- Deletion Facts
  Use Command **(retract)**

- General Format
  (retract <fact-index>)

- Deletion Facts
  Use Command **(retract)**

- Example
  (retract 3)

Excercise

1. Buatlah template untuk fakta mahasiswa
   (slot nama, nrp, fakultas, departeman,)

2. Tambahkan data 5 berdasarkan template tersebut !
3. Lakukan beberapa perintah sebagai berikut:
   a. Modifikasi fakultas dan departemen
   b. Duplikasi data dengan mengubah nama dan nrp mahasiswa ke-3
   c. Hapus dari working memori mahasiswa pertama