



UNIVERSITAT
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Workbook: Rule-Based Systems

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Learning objectives

- ▶ To run a trace of a RBS based on CLIPS

- **Question 1:** Provided the following RBS in CLIPS, run a trace showing the state of Facts and Agenda using BFS strategy.

```
(defacts data (list 4 5 3 46 12 10))
```

```
(defrule R1  
  ?f <- (list $?x ?y ?z $?w)  
  (test (< ?z ?y))  
=>  
  (retract ?f)  
  (assert (list $?x ?z ?y $?w)))
```

- **Question 2:** Provided the following RBS in CLIPS, run a trace showing the state of Facts and Agenda using BFS strategy.

```
(deffacts data (list 1 2 3 4))  
(defrule R1  
  ?f <- (list ?x $?z) =>  
  (retract ?f)  
  (assert (list $?z))  
  (assert (element ?x)))  
(defrule R2  
  ?f <- (element ?x)  
         (element ?y)  
  (test (< ?x ?y)) =>  
  (retract ?f)  
  (assert (list-new ?x ?y)))
```

- **Question 3:** Run a trace considering as an initial fact (list 1 2 2 4)

```
(deffacts data (list 1 2 2 4))
```

```
(defrule R1
```

```
  ?f <- (list ?x $?z) =>
```

```
  (retract ?f)
```

```
  (assert (list $?z))
```

```
  (assert (element ?x)))
```

```
(defrule R2
```

```
  ?f <- (element ?x)
```

```
        (element ?y)
```

```
  (test (< ?x ?y)) =>
```

```
  (retract ?f)
```

```
  (assert (list-new ?x ?y)))
```

- **Question 4:** Run a trace discarding **retract** from R1

```
(def facts data (list 1 2 3 4))
```

```
(defrule R1  
  ?f <- (list ?x $?z) =>  
  (assert (list $?z))  
  (assert (element ?x)))
```

```
(defrule R2  
  ?f <- (element ?x)  
        (element ?y)  
  (test (< ?x ?y)) =>  
  (retract ?f)  
  (assert (list-new ?x ?y)))
```

► **Question 5:** Run a trace discarding **retract** from R2

```
(defacts data (list 1 2 3 4))
```

```
(defrule R1  
  ?f <- (list ?x $?z) =>  
  (retract ?f)  
  (assert (list $?z))  
  (assert (element ?x)))
```

```
(defrule R2  
  ?f <- (element ?x)  
        (element ?y)  
  (test (< ?x ?y)) =>  
  (assert (list-new ?x ?y)))
```

- **Question 6:** Provided the following RBS in CLIPS, run a trace showing the state of Facts and Agenda using BFS strategy.

```
(deffacts data (list a b c a b c c b a c b a))  
(defrule R1  
  ?f <- (list $?x1 ?y $?x2 ?y $?x3)  
  (test (> (length $?x2) 0))  
  (test (not (member ?y $?x2))) =>  
  (retract ?f)  
  (assert (list $?x1 ?y ?y $?x3)))
```