```
Cohen & Levesque : language

Language:

Operators:

HAPPENS : action happens next

DONE : action has just happened

AGT i a : agent i is the only agent of action a

BEL i : formula follows from i's beliefs

GOAL i : formula follows from i's goals

a ≤ b : action a is an initial subsequence of b
```

Cohen & Levesque: models

Semantics

- Model: < □, P, E, Agt, T, B, G, □ >, where

□ is a set (universe of discourse)

P is a set of agents

E is a set of primitive event types

Agt □ [E□ P] specifies the agent of an event

T□[Z□ E]: a set of possible worlds (event seqs)

B □ T□P□Z□T is the belief accessibility relation

G □ T□P□Z□T is the goal accessibility relation

□ interprets predicate symbols

Cohen & Levesque: satisfaction

Satisfaction: [v(a) □ E*]

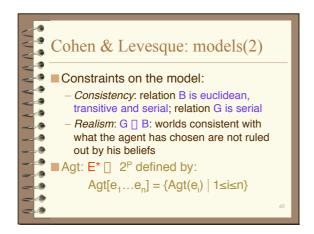
- M, □, v, n ⊨ AGT i a □ Agt[v(a)] = {v(i)}

- M, □, v, n ⊨ HAPPENS □ □ exists m≥n such that M, □, v, n [[□]] m

- M, □, v, n ⊨ DONE □ □ exists m≤n such that M, □, v, m [[□]] n

- M, □, v, n ⊨ BEL i □ □ for all □* with <□,n>B[v(i)]□*: M, □*, v, n ⊨ □

- M, □, v, n ⊨ GOAL i □ □ for all □* with <□,n>G[v(i)]□*: M, □*, v, n ⊨ □



Cohen & Levesque: BEL/GOAL

Validities:

| (BEL i | BEL i (BEL i | BEL i | BEL

```
Cohen & Levesque: A-GOALS

Achievement goals

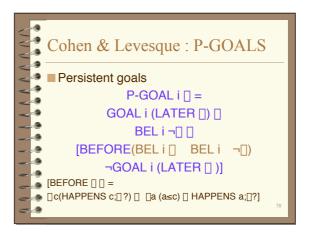
A-GOAL i [] = GOAL i (LATER []) []

BEL i ¬ []

[LATER [] = ¬[] [] []

[ [] = [] a (HAPPENS a; []?) ]
```





```
Cohen & Levesque: logic of P-GOALS

| P-GOALi | P-GOALi | BELi | KNOWi | SERVICE | S
```

```
Cohen & Levesque: INTEND<sub>1</sub>

INTEND<sub>1</sub> i [] =
P-GOAL i [DONE i
(BEL i (HAPPENS []))?; []]

NB Wrong definition:
- INTEND<sub>1</sub> i [] = P-GOAL i []b (HAPPENS i b; (DONE i [])?)
[HAPPENS i a = HAPPENS a [] AGT i a]
[DONE i a = DONE a [] AGT i a]
```

```
Cohen & Levesque: INTEND<sub>1</sub>

INTEND<sub>1</sub> i [] =
P-GOAL i [DONE i
(BEL i (HAPPENS []))?; []]

NB Wrong definition:
- INTEND<sub>1</sub> i [] = P-GOAL i []b (HAPPENS i b; (DONE i [])?)

[HAPPENS i a = HAPPENS a [] AGT i a]
[DONE i a = DONE a [] AGT i a]
```

```
Cohen & Levesque: INTEND<sub>2</sub>

INTEND<sub>2</sub> i \square =

P-GOAL i \squarea (DONE i

[BEL i \squareb HAPPENS i b; \square?) \square

¬GOAL i ¬HAPPENS i a; \square? ]?; a; \square?)
```

```
Cohen & Levesque: INTEND<sub>2</sub>

INTEND<sub>2</sub> i \square =

P-GOAL i \squarea (DONE i

[BEL i \squareb HAPPENS i b; \square?) \square

¬GOAL i ¬HAPPENS i a; \square? ]?; a; \square?)
```

```
Cohen & Levesque: Bratman revisited

Screen of admissibility

FINTEND, i [] (BEL i [DONE i [] ] ¬DONE i []) [] ¬INTEND, i []; []

Tracking' success

F (DONE i [INTEND, i [] ] BEL i (HAPPENS i [])]?; []) []

BEL i (¬DONE i []) []

¬BEL i (¬DONE i []) []

INTEND, i []
```