

This is the specification for an employment exchange.

The state of the system consists of two sets - 'unemployed' represents the set of people who are registered with the system but not found a job yet while 'employed' represents the set of people who are previously registered with the system and found the job through the system. The state invariant asserts that the two sets are mutually exclusive; i.e., no person is entered into both the sets at any time.

Initially, both the sets are empty.

The operation *Register* is used to register a new person into the system. This person must not be in any of the two sets (must be new to the system). This is stated as the precondition. The postcondition ensures that the new person is included in the *unemployed* set.

The operation *ChangeStatus* moves a person from the *unemployed* set to the *employed* set indicating that this person found a job through the employment exchange.

The last operation *HowManyUnemployed* is an inquiry operation that returns the count of the people who are registered but unemployed. Notice that this operation does not change the state of the system even though it uses a state variable.

[*PERSON*]

EmploymentExchange

unemployed : $\mathbb{P} PERSON$

employed : $\mathbb{P} PERSON$

$unemployed \cap employed = \emptyset$

INIT

$unemployed = \emptyset$

$employed = \emptyset$

Register

$\Delta(unemployed)$

new? : *PERSON*

$new? \notin unemployed$

$new? \notin employed$

$unemployed' = unemployed \cup \{new?\}$

ChangeStatus

$\Delta(unemployed, employed)$

who? : *PERSON*

$who? \in unemployed$

$unemployed' = unemployed \setminus \{who?\}$

$employed' = employed \cup \{who?\}$

HowManyUnemployed

count! : \mathbb{N}

$count! = \#unemployed$