Part 3

Question 3.1

Fix relations:

wall(i,j): the location of wall

target(i,j): the location of goal

Dynamic relations:

player(i,j): the location of player

boulders(i,j): the location of boulder

empty (i,j): (i,j) is not occupied by any items(wall, player, boulder).

Question 3.2

move(i,j,k,l)

precondition:

player(i,j), not boudler(i,j), not boudlers(k,l), not wall(i,j), not wall(k,l), not empty(i,j), empty(k,l)

effects: player(k,l), not player(i,j), not empty(k,l), empty(i,j)

push(i,j,k,l,m,n)

precondition:

player(i,j), not boulder(i,j), boulder(k,l), not boulder(m,n), not empty(i,j), not empty(k,l), empty(m,n), not wall(i,j), not wall(k,l), not wall(m,n).

effect:

not player(i,j), player(k,l), empty(i,j), not empty(m,n), not boulder(k,l), boulder(m,n).

Question 3.3

$S_{initial}$ = { wall(1,1)…, empty(3,2)…, player(2,2), boulder(3,3), boulder(3,4), boulder(4,3), target(8,4), target(8,5), target(8,6) }

Question 3.4

S_{goal} = { wall(1,1)…, empty(3,2)…, player(7,6), boulder(8,4), boulder(8,5), boulder(8,6), target(8,4), target(8,5), target(8,6) }

Question 3.5

The process of solving Sokoban is important, but Answer Set Programming focus on results and have difficulty in acquiring the process of addressing Sokoban.