# keyboardAgents.py (**original**)

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```python
# keyboardAgents.py
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# Licensing Information: Please do not distribute or publish solutions to this
# project. You are free to use and extend these projects for educational
# purposes. The Pacman AI projects were developed at UC Berkeley, primarily by
# John DeNero (denero@cs.berkeley.edu) and Dan Klein (klein@cs.berkeley.edu).
# For more info, see http://inst.eecs.berkeley.edu/~cs188/sp09/pacman.html

from game import Agent
from game import Directions
import random

class KeyboardAgent(Agent):
    """
    An agent controlled by the keyboard.
    """
    # NOTE: Arrow keys also work.
    WEST_KEY  = 'a'
    EAST_KEY  = 'd'
    NORTH_KEY = 'w'
    SOUTH_KEY = 's'
    STOP_KEY = 'q'

    def __init__( self, index = 0 ):

        self.lastMove = Directions.STOP
        self.index = index
        self.keys = []

    def getAction( self, state):
        from graphicsUtils import keys_waiting
        from graphicsUtils import keys_pressed
        keys = keys_waiting() + keys_pressed()
        if keys != []:
            self.keys = keys

        legal = state.getLegalActions(self.index)
        move = self.getMove(legal)

        if move == Directions.STOP:
            # Try to move in the same direction as before
            if self.lastMove in legal:
                move = self.lastMove

        if (self.STOP_KEY in self.keys) and Directions.STOP in legal: move = Directions.STOP

        if move not in legal:
            move = random.choice(legal)

        self.lastMove = move
        return move

    def getMove(self, legal):
        move = Directions.STOP
        if   (self.WEST_KEY in self.keys or 'Left' in self.keys) and Directions.WEST in legal:  move = Directions.WEST
        if   (self.EAST_KEY in self.keys or 'Right' in self.keys) and Directions.EAST in legal: move = Directions.EAST
        if   (self.NORTH_KEY in self.keys or 'Up' in self.keys) and Directions.NORTH in legal:  move = Directions.NORTH
        if   (self.SOUTH_KEY in self.keys or 'Down' in self.keys) and Directions.SOUTH in legal: move = Directions.SOUTH
        return move
```

```
class KeyboardAgent2(KeyboardAgent):
    """
    A second agent controlled by the keyboard.
    """
    # NOTE: Arrow keys also work.
    WEST_KEY  = 'j'
    EAST_KEY  = "l"
    NORTH_KEY = 'i'
    SOUTH_KEY = 'k'
    STOP_KEY = 'u'

    def getMove(self, legal):
        move = Directions.STOP
        if   (self.WEST_KEY in self.keys) and Directions.WEST in legal:  move = Directions.WEST
        if   (self.EAST_KEY in self.keys) and Directions.EAST in legal: move = Directions.EAST
        if   (self.NORTH_KEY in self.keys) and Directions.NORTH in legal:   move = Directions.NORTH
        if   (self.SOUTH_KEY in self.keys) and Directions.SOUTH in legal: move = Directions.SOUTH
        return move
```