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1
2 def NLExpressionToLMD(remain_phrase):
3     import copy
4
5     #===== Locus Formula =====
6     taro_turtle = ['taro_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']] # The
7     first_member is Entity name, and last 2 members are governor and dependant (unification)
8     anna_turtle = ['anna_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']] # 'a'
9     refers to physical location
10    shop_keeper = ['shop_keeper_', [['sand'], ['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
11    bank_clerk = ['bank_clerk_', [['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
12    tom = ['tom_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
13    mary = ['mary_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
14    he = ['he_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
15    she = ['she_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
16    i = ['i_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
17    me = ['me_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
18    you = ['you_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
19    it = ['it_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
20    everything = ['everything_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pn', '+']], ['x', 'none', 'none']]
21
22    phone = ['phone_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
23    book = ['book_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
24    box = ['box_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
25    bus = ['bus_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '+']], ['x', 'none', 'none']]
26    car = ['car_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '+']], ['x', 'none', 'none']]
27    flower_shop = ['flower_shop_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
28    drug_store = ['drug_store_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
29    hospital = ['hospital_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
30    post_office = ['post_office_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
31    swimming_pool = ['swimming_pool_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
32    playground = ['playground_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]

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62 book_shelf = ['book_shelf_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
63 tulip = ['tulip_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
64 carnation = ['carnation_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
65 paracetamol = ['paracetamol_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
66 letter = ['letter_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
67 #voice = ['voice_', ['x', 'voice', 'x', 'y', 'a', 'n', '+']], ['x', 'y']]
68 voice = ['voice_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
69 money = ['money_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
70 medicine = ['medicine_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
71 drug = ['drug_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
72 goldfish = ['goldfish_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '+']], ['x', 'none', 'none']]
73 fish = ['fish_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '+']], ['x', 'none', 'none']]
74 dog = ['dog_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '+']], ['x', 'none', 'none']]
75 elephant = ['elephant_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '+']], ['x', 'none', 'none']]
76 water = ['water_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'n', '-']], ['x', 'none', 'none']]
77
78 who = ['who_', ['sand'], [['x', 'x', 'who', 'people', 'pn?', '+']], ['x', 'none', 'none']]
79 what = ['what_', ['sand'], [['x', 'x', 'what', 'what', 'thing', 'pn?', '+']], ['x', 'none', 'none']]
80 where = ['where_', ['sand'], [['x', 'x', 'where', 'where', 'a', 'pn?', '+']], ['x', 'none', 'none']]
81 when = ['when_', ['sand'], [['x', 'x', 'when', 'when', 'time', 'pn?', '+']], ['x', 'none', 'none']]
82 how = ['how_', ['sand'], [['how', 'x', 'p', 'q', 'a', 'pn?', '+']], ['x', 'x', 'how', 'a', 'pn?', '+']], [
    'x', 'none', 'none']]
83 #how = ['how', 'x', 'p', 'q', 'a', 'pn', '+']
84
85 there = ['there_', ['sand'], [['x', 'y', 'there', 'there', 'a', 'ad', '-']], ['x', 'y', 'none']]
86 here = ['here_', ['sand'], [['x', 'x', 'here', 'here', 'a', 'ad', '-']], ['x', 'none', 'here']]
87 please = ['please_', ['sand'], [['x', 'x', 'pleased', 'pleased', 'happiness', 'ad', '+']], ['x', 'none', '
    none']]
88 fine = ['fine_', ['sand'], [['x', 'x', 'fine', 'fine', 'happiness', 'aj', '+']], ['x', 'none', 'none']]
89 good = ['good_', ['sand'], [['x', 'x', 'good', 'good', 'happiness', 'aj', '+']], ['x', 'none', 'none']]
90 hungry = ['hungry_', ['sand'], [['x', 'x', 'hungry', 'hungry', 'happiness', 'aj', '-']], ['x', 'none', 'none
    ']]

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91 red = ['red_', ['sand'], [['x', 'x', 'red', 'red', 'color', 'aj', '+']], ['x', 'none', 'none']]
92 gold = ['gold_', ['sand'], [['x', 'x', 'gold', 'gold', 'color', 'aj', '+']], ['x', 'none', 'none']]
93 left = ['left_', ['sand'], [['x', 'x', 'obj1', 'obj2', 'a', 'aj', '+']], ['x', 'x', 'left', 'left', 'direction', 'aj', '+']], ['obj1', 'obj2', 'none']]
94 right = ['right_', ['sand'], [['x', 'x', 'obj1', 'obj2', 'a', 'aj', '+']], ['x', 'x', 'right', 'right', 'direction', 'aj', '+']], ['obj1', 'obj2', 'none']]
95 behind = ['behind_', ['sand'], [['x', 'x', 'obj1', 'obj2', 'a', 'aj', '+']], ['x', 'x', 'behind', 'behind', 'direction', 'aj', '+']], ['obj1', 'obj2', 'none']]
96 front = ['front_', ['sand'], [['x', 'x', 'obj1', 'obj2', 'a', 'aj', '+']], ['x', 'x', 'front', 'front', 'direction', 'aj', '+']], ['obj1', 'obj2', 'none']]
97
98 be = ['be_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+']], ['x', 'x', 'none']]
99 do = ['do_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+']], ['x', 'x', 'none']]
100 can = ['can_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+']], ['x', 'x', 'none']]
101 run = ['run_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+']], ['x', 'none', 'none']]
102 travel = ['travel_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+']], ['x', 'none', 'none']]
103 go = ['go_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+']], ['x', 'none', 'none']]
104 #D = ['x', 'y', 'p', 'q', 'happiness', 'v', '+']
105 #love = [D, [D, 'x', 'p', 'q', 'happiness', 'v', '+']]
106 love = ['love_', ['sand'], [['x', 'y', 'p', 'q', 'happiness', 'v', '+']], ['y', 'x', 'p', 'q', 'happiness', 'v', '+']], ['x', 'y', 'none']]
107 like = ['like_', ['sand'], [['x', 'x', 'p', 'q', 'happiness', 'v', '+']], ['x', 'none', 'none']]
108 paint = ['paint_', ['sand'], [['x', 'y', 'z', 'z', 'color', 'v', '+']], ['x', 'y', 'z']]
109 buy = ['buy_', ['sand'], [['y', 'x', 'z', 'y', 'x', 'a', 'v', '+']], [['y', 'x', 'money', 'x', 'y', 'a', 'v', '+']], ['x', 'y', 'z']] # [x,y] refers to the cooperation between two people.
110 give = ['give_', ['sand'], [['x', 'z', 'x', 'y', 'a', 'v', '+']], ['x', 'y', 'z']] # Tom(=x) give Mary(=y) a book(=z).
111 withdraw = ['withdraw_', ['sand'], [['x', 'y', 'money', 'x', 'y', 'a', 'v', '+']], ['x', 'y', 'none']] # Transportation of real money
112 call = ['call_', ['sand'], [['x', 'phone', 'x', 'x', 'a', 'v', '+']], ['x', 'voice', 'x', 'y', 'a', 'v', '+']], ['x', 'y', 'none']]
113 carry_1 = ['carry_', ['sand'], [['x', 'y', 'x', 'x', 'a', 'v', '+']], ['x', 'x', 'p', 'q', 'a', 'v', '+']], ['x',

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113 'y', 'none']]
114 carry_2 = ['carry_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+'], ['x', 'y', 'p', 'q', 'a', 'v', '+']], ['x',
'y', 'none']]
115 drive = ['drive_', ['sand'], [['x', 'x', 'y', 'y', 'a', 'v', '+'], ['x', 'y', 'p', 'q', 'a', 'v', '+']], ['x', 'y
', 'none']] # x = Controller, y = someone/something is controlled by x
116 move = ['move_', ['sand'], [['x', 'y', 'p', 'q', 'a', 'v', '+'], ['x', 'y', 'p', 'q', 'a', 'v', '+']], ['x', 'y', 'none']]
117 keep = ['keep_', ['sand'], [['x', 'y', 'p', 'q', 'a', 'v', '+'], ['x', 'y', 'p', 'q', 'a', 'v', '+']], ['x', 'y', 'none']]
118 want = ['want_', ['sand'], [['x', 'y', 'x', 'x', 'a', 'v', '+'], ['y', 'x', 'p', 'q', 'happiness', 'v', '+']], ['
x', 'y', 'none']]
119 take = ['take_', ['sand'], [['x', 'y', 'p', 'q', 'a', 'v', '+'], ['x', 'y', 'p', 'q', 'a', 'v', '+']], ['x
', 'p', 'none']]
120 return_z = ['return_', ['cand'], [['x', 'x', 'p', 'q', 'a', 'v', '+'], ['x', 'x', 'q', 'p', 'a', 'v', '+']], ['x
', 'p', 'none']]
121 fetch_z = ['fetch_', ['cand', 'sand'], [['x', 'x', 'p', 'q', 'a', 'v', '+'], ['x', 'x', 'q', 'p', 'a', 'v', '+']]
122 , ['x', 'y', 'x', 'a', 'v', '+']], ['x', 'p', 'none']]
123
124 with_z = ['with_', ['sand'], [['x', 'y', 'x', 'x', 'a', 'pp', '+'], ['x', 'y', 'p', 'none']]
125 at = ['at_', ['sand'], [['x', 'x', 'p', 'p', 'a', 'pp', '+'], ['x', 'p', 'none']]
126 in_z = ['in_', ['sand'], [['x', 'x', 'p', 'p', 'a', 'pp', '+'], ['x', 'p', 'none']] # For example: Tom
in bus = [Tom, Tom, bus, a]
127 on = ['on_', ['sand'], [['x', 'x', 'p', 'p', 'a', 'pp', '+'], ['x', 'p', 'none']]
128 by = ['by_', ['sand'], [['x', 'y', 'p', 'q', 'a', 'pp', '+'], ['y', 'x', 'none']]
129 to = ['to_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pp', '+'], ['x', 'q', 'none']] # For example: to
school = [x, x, p, school, a]
130 from_z = ['from_', ['sand'], [['x', 'x', 'p', 'q', 'a', 'pp', '+'], ['x', 'p', 'none']] # For example:
from town = [x, x, town, q, a]
131 along = ['along_', ['sand'], [['x', 'x', 'p', 'p', 'direction', 'pp', '+'], ['x', 'p', 'none']]
132 north = ['north_', ['sand'], [['x', 'x', 'north', 'direction', 'pp', '-']], ['x', 'none', 'none']]
133 south = ['south_', ['sand'], [['x', 'x', 'south', 'direction', 'pp', '-']], ['x', 'none', 'none']]
134 between = ['between_', ['sand', 'cand'], [['x', 'x', 'obj1', 'obj2', 'a', 'pp', '+'], ['x', 'x', 'obj2', '
obj3', 'a', 'pp', '+'], ['x', 'x', 'obj1', 'obj3', 'direction', 'pp', '+']], ['obj2', 'obj1', 'obj3']]
135

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