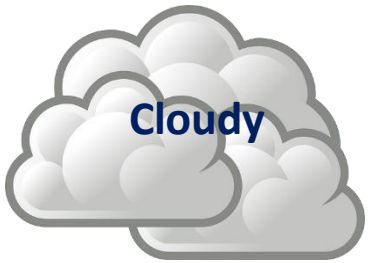
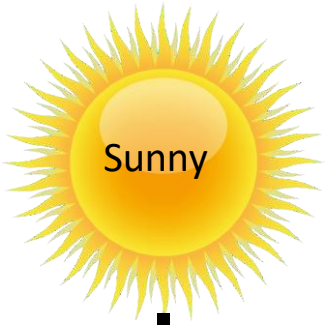
Hidden Markov Model

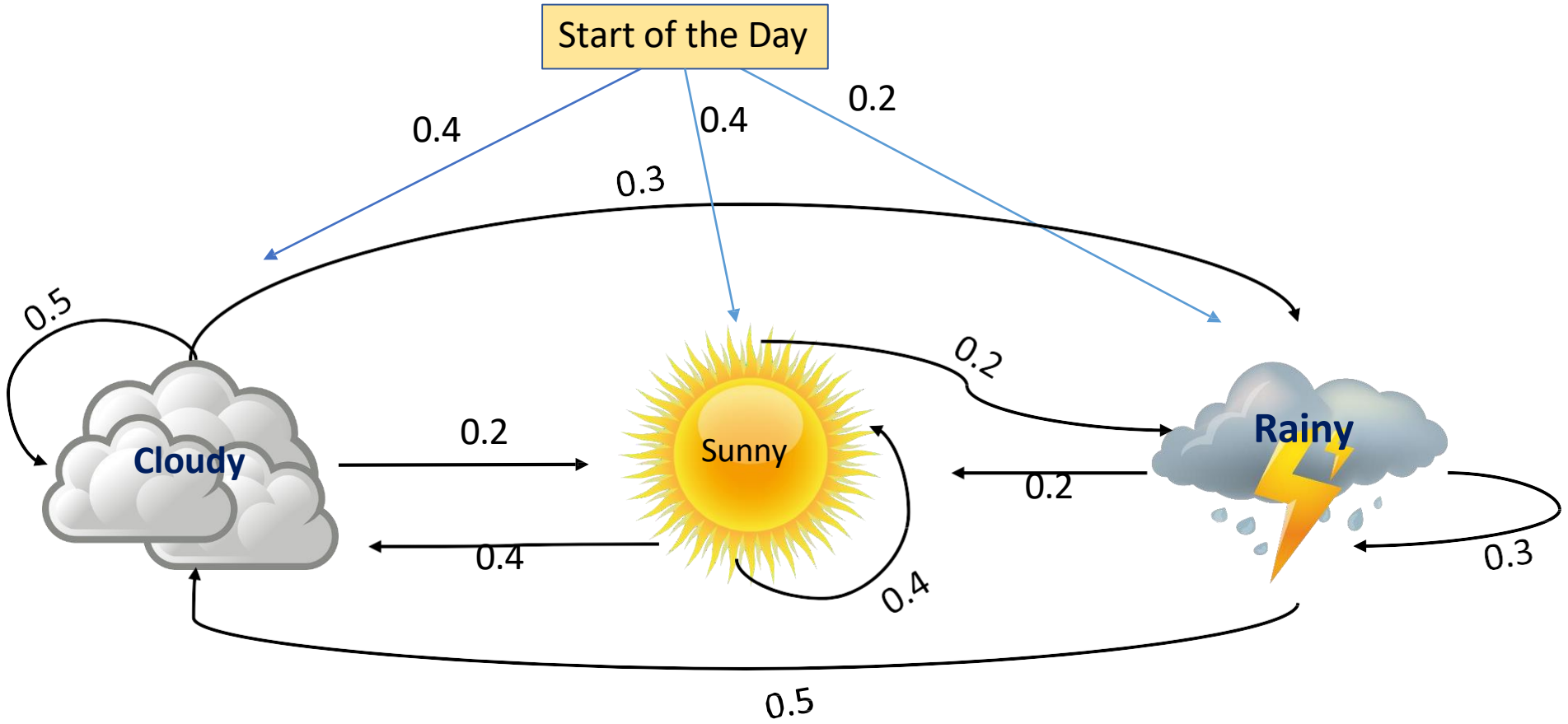




10-Day Weather

As of 12:44 IST

Sat 09	**23°**/11°	Sunny	4%	WNW 11 km/h
Sun 10	**23°**/10°	Mostly Sunny	3%	WNW 14 km/h
Mon 11	**23°**/10°	Mostly Sunny	3%	S 5 km/h
Tue 12	**21°**/10°	Mostly Sunny	12%	SE 8 km/h
Wed 13	**22°**/10°	Sunny	3%	SSE 8 km/h
Thu 14	**22°**/10°	Mostly Sunny	3%	SW 8 km/h
Fri 15	**21°**/10°	Partly Cloudy	3%	WNW 8 km/h
Sat 16	**21°**/10°	Mostly Sunny	3%	WNW 8 km/h
Sun 17	**21°**/10°	Partly Cloudy	3%	WNW 8 km/h



Future Day

Present Day

	Cloudy	Sunny	Rainy
Cloudy	0.5	0.2	0.3
Sunny	0.4	0.4	0.2
Rainy	0.3	0.2	0.5

P (E2 | E1)

P (Sunny | Cloudy)

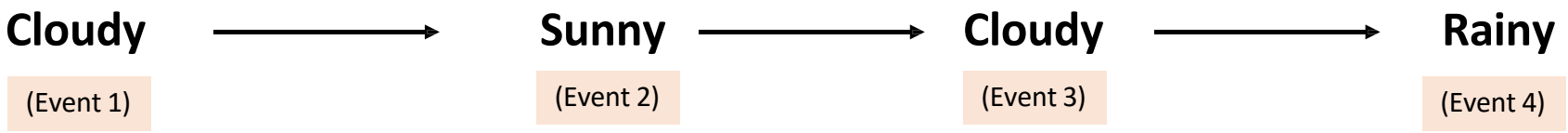
(Probability of Sunny will happened after the cloudy already happened)

Cloudy - > Sunny = (0.2)

Future Day

Present Day

	Cloudy	Sunny	Rainy
Cloudy	0.5	0.2	0.3
Sunny	0.4	0.4	0.2
Rainy	0.3	0.2	0.5



P (E2, E3, E4 | E1)

	Cloudy	Sunny	Rainy
Cloudy	0.5	0.2	0.3
Sunny	0.4	0.4	0.2
Rainy	0.3	0.2	0.5

P (init Prob. Of E1) * P(E2 | E1) * P(E3 | E2) * P(E4 | E3)

Probability = 0.2 * 0.4 * 0.3

Cloudy	Sunny	Rainy
0.4	0.4	0.2

(Event 1) (Event 2) (Event 3) (Event 4)

(Cloudy / Sunny /Rainy) (Cloudy / Sunny /Rainy) (Cloudy / Sunny /Rainy) (Cloudy / Sunny /Rainy)

1. Cloudy - > Sunny -> Rainy -> Cloudy = P 1
2. Cloudy -> Rainy -> Cloudy -> Sunny = P 2

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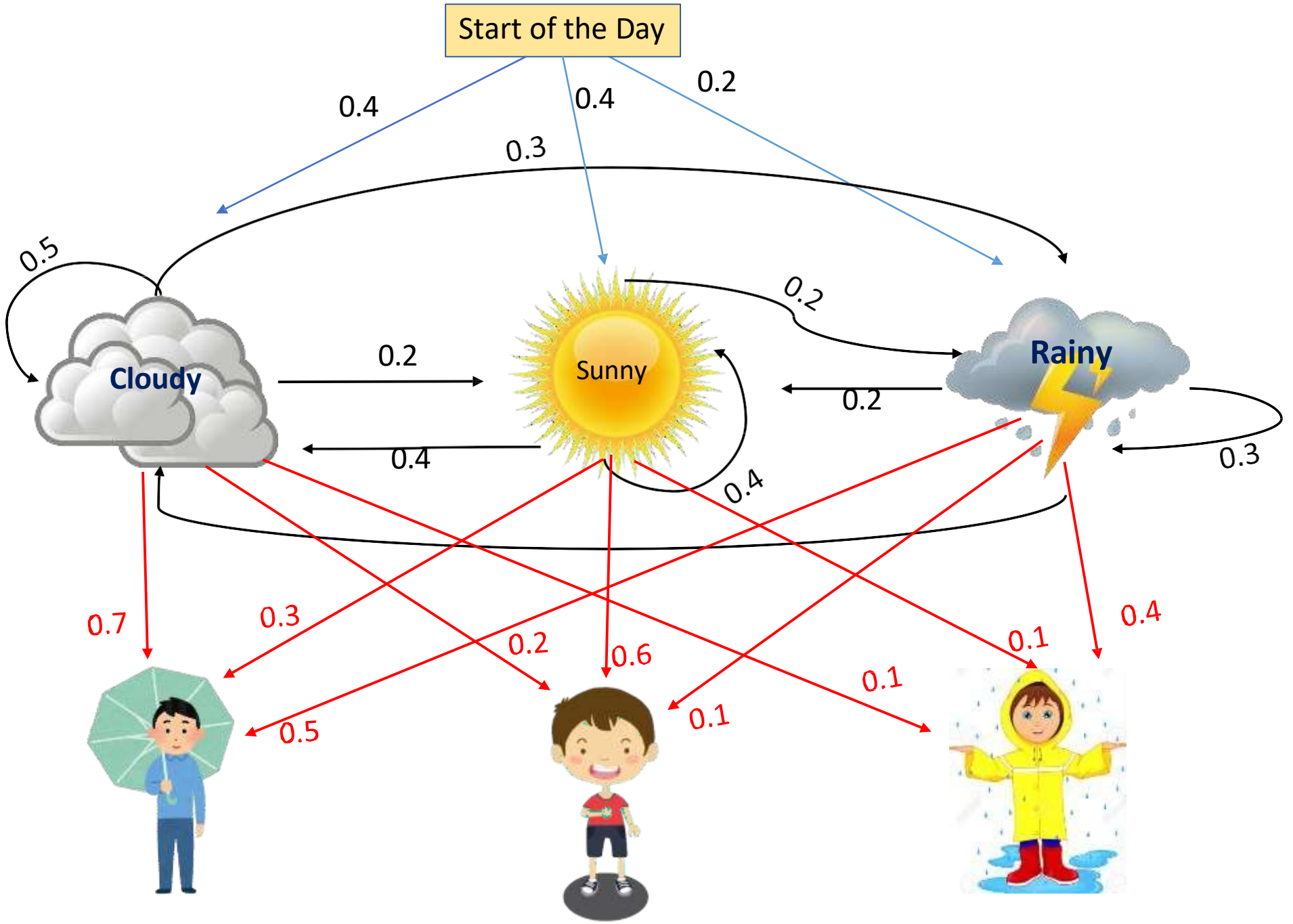
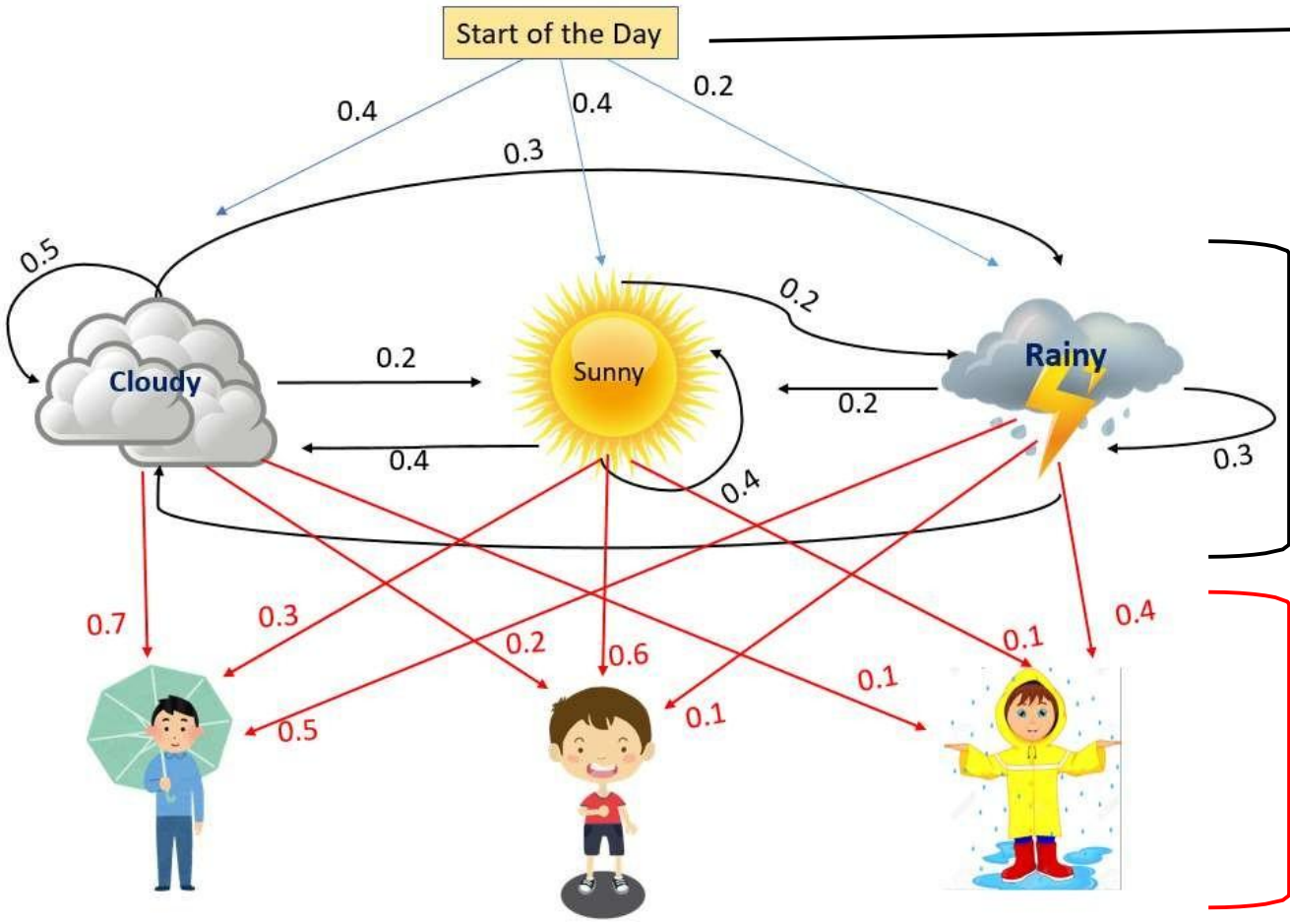
.
.

81. Sunny -> cloudy -> Rainy -> Rainy = P 81


Start of the Day
0.4
0.4
0.2
0.3
0.5
Cloudy
0.2
Sunny
0.2
Rainy
0.4
0.2
0.3
0.4
0.7
0.3
0.2
0.6
0.1
0.4
0.5
0.1
0.1



Initial Probability

Initial Probability Matrix

Cloudy	Sunny	Rainy
0.4	0.4	0.2

Transition Probability

Hidden States

Transition Probability Matrix

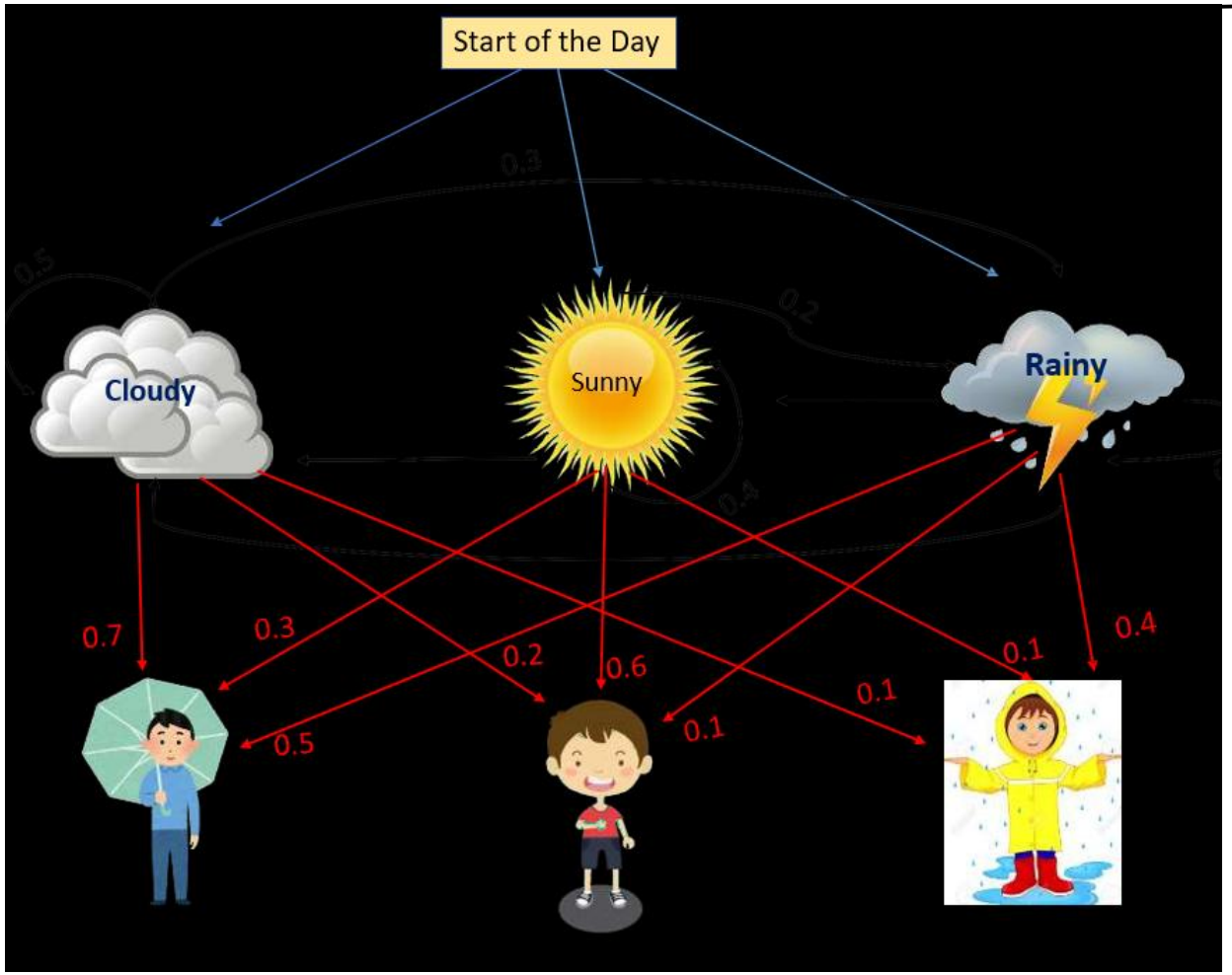
	Cloudy	Sunny	Rainy
Cloudy	0.5	0.2	0.3
Sunny	0.4	0.4	0.2
Rainy	0.3	0.2	0.5

Emission Probability

Observable States

Emission Probability Matrix

	Umbrella	Normal	Raincoat
Cloudy	0.7	0.2	0.1
Sunny	0.3	0.6	0.1
Rainy	0.5	0.1	0.4



Initial Probability

Initial Probability Matrix

Cloudy	Sunny	Rainy
0.4	0.4	0.2

Transition Probability

Hidden States

Transition Probability Matrix

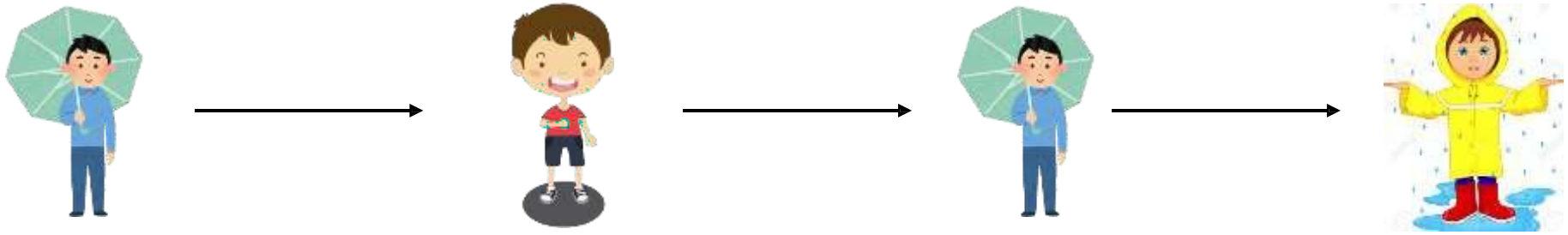
	Cloudy	Sunny	Rainy
Cloudy	0.5	0.2	0.3
Sunny	0.4	0.4	0.2
Rainy	0.3	0.2	0.5

Emission Probability

Observable States

Emission Probability Matrix

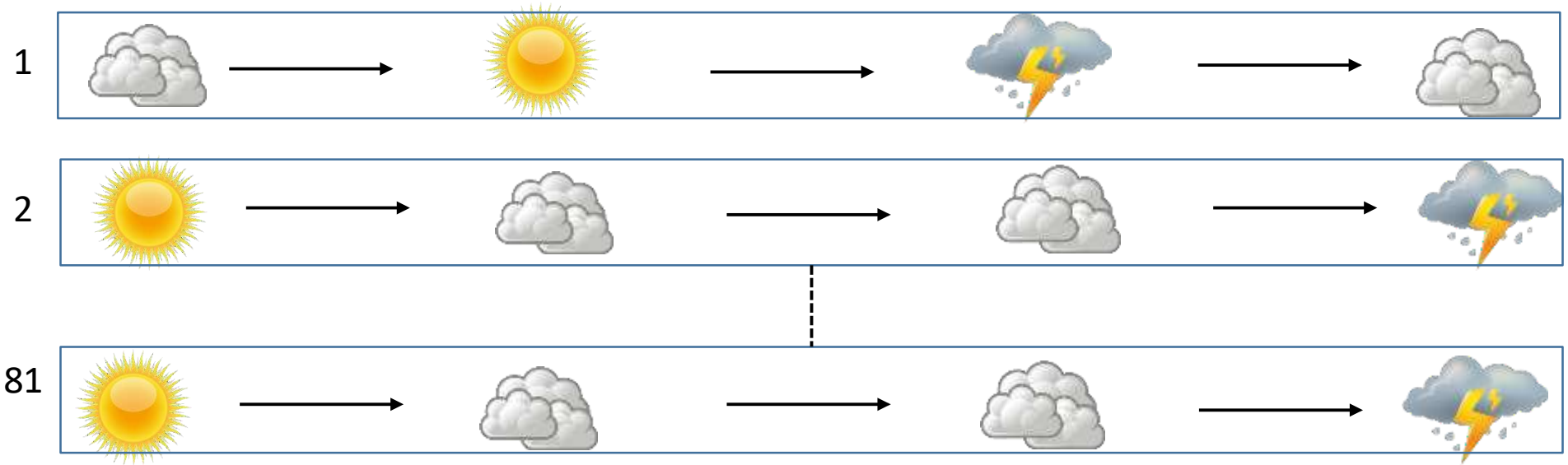
	Umbrella	Normal	Raincoat
Cloudy	0.7	0.2	0.1
Sunny	0.3	0.6	0.1
Rainy	0.5	0.1	0.4

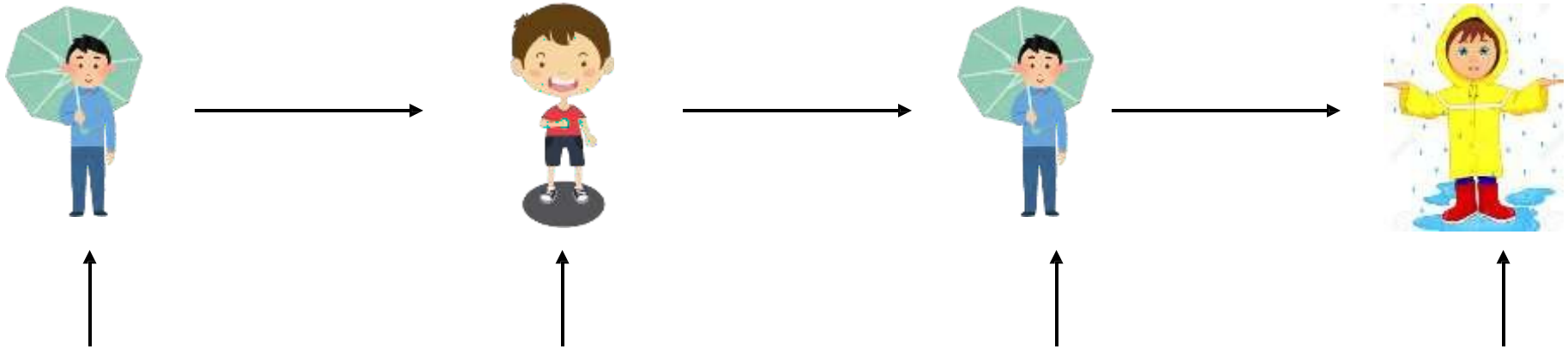


? ? ? ?

(Cloudy / Sunny /Rainy) (Cloudy / Sunny /Rainy) (Cloudy / Sunny /Rainy) (Cloudy / Sunny /Rainy)

3 * 3 * 3 * 3 = 81





P(Umbrella | Cloudy) * P(Normal | Sunny) * P(Umbrella | Rainy) * P (Raincoat | Cloudy)

*

P(init prob. Of Cloudy) * P (Sunny | cloudy) * P (Rainy | Sunny) * P(Cloudy | Rainy)

Initial Probability Matrix

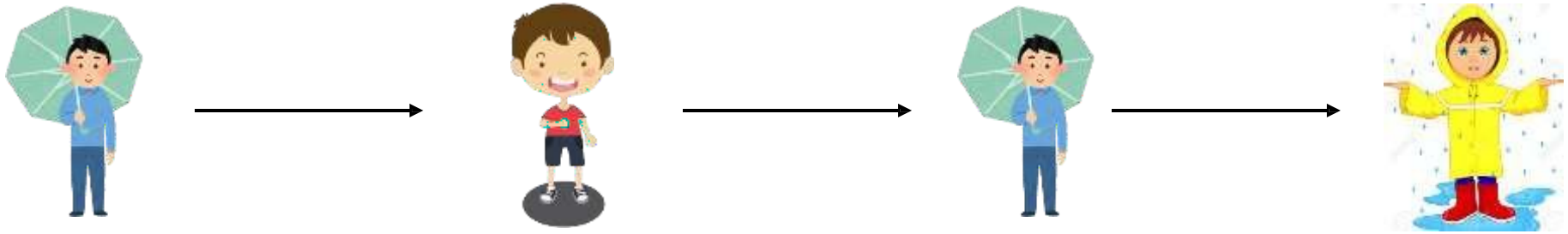
Cloudy	Sunny	Rainy
0.4	0.4	0.2

Emission Probability Matrix

	Umbrella	Normal	Raincoat
Cloudy	0.7	0.2	0.1
Sunny	0.3	0.6	0.1
Rainy	0.5	0.1	0.4

Transition Probability Matrix

	Cloudy	Sunny	Rainy
Cloudy	0.5	0.2	0.3
Sunny	0.4	0.4	0.2
Rainy	0.3	0.2	0.5



= P 1

= P 2

= P 81