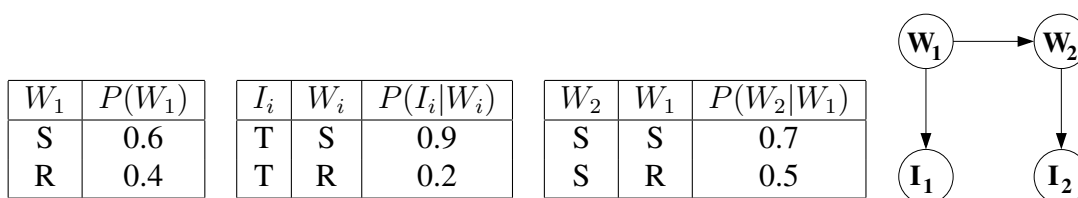


# 1 Sampling

The diagram below describes a person's ice cream eating habits based on the weather. The nodes  $W_i$  stand for the weather on a day  $i$ , which can either be rainy R or sunny S. The nodes  $I_i$  represent whether or not the person ate ice-cream on day  $i$ , and the node takes values T (for truly eating ice cream) or F. The conditional probability distributions relevant to the graphical model are also given to you.



Suppose we want to answer the query  $P(W_2|I_1 = T, I_2 = F)$  using likelihood weighting.

1. Generate 6 samples using the following random numbers left to right.

0.41 0.85 0.93 0.67 0.13 0.81 0.05 0.33 0.58 0.49 0.61 0.49

Sample number	Sample
1	
2	
3	
4	
5	
6	

2. Derive the weights  $w$  for each sample.

Sample number	weight
1	
2	
3	
4	
5	
6	

3. Use likelihood weighting to estimate  $P(W_2|I_1 = T, I_2 = F)$ .