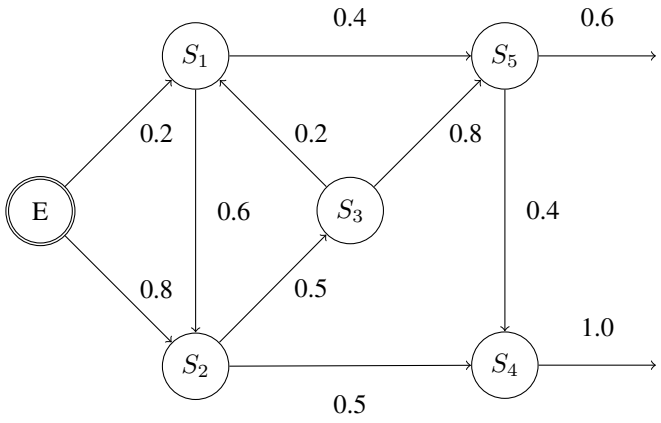
60017 Tutorial: User Behaviour Graphs

Exercise 1. A website consists of four web pages: *Home* (H), *Add* (A), *Buy* (B), and *Catalog* (C). The following user navigation sessions have been monitored in the web server log files:

- $H \to C \to A \to B$
- $H \to C \to H \to C$
- $H \to C$

Question 1.1 Draw a user behaviour graph (UBG) that models the observed sessions.
Question 1.2 Determine the visit ratio to each state of the UBG and the average session length.

Exercise 2. Consider the following user behaviour graph (UBG)



describing visits to pages S_1, S_2, S_3, S_4, S_5 and where E denotes the entry state.

Question 2.1 Determine the mean session length.
Question 2.2 Give a theoretical formula to determine the probability $p_3^{(4)}$ of visiting page S_3 as fourth within the session (You are not asked to determine it numerically).
Question 2.3 Helping yourself with the UBG figure, can you tell from the diagram the value of $p_3^{(4)}$?

Exercise 3. A basic e-commerce website consists of the following web pages: *Home* (H), *Add* (A), *Buy* (B), and *Catalog* (C). The following user navigation sessions have been recorded in the web server log files:

- $H \to C$
- $H \to C \to A \to B$
- $H \to C \to H$

Question 3.1 Draw a user behaviour graph (UBG) that models the observed sessions.
Question 3.2 Determine the visit ratio to each state of the UBG.
Question 3.3 Use the visit ratios to predict the average session length.