Subject CS2

Corrections to 2025 study material

0 Introduction

This document contains details of any errors and ambiguities that have been brought to our attention in the Subject CS2 study materials for the 2025 exams. We will incorporate these changes into the study material each year. We are always happy to receive feedback from students, particularly details concerning any errors, contradictions or unclear statements in the courses. If you have any such comments on this course please email them to CS2@bpp.com.

You may also find it useful to refer to the Subject CS2 threads on the ActEd Discussion Forum. (You can reach the Forums by clicking on the 'Discussion Forums' button at the top of the ActEd homepage, or by going to **www.acted.co.uk/forums/**.)

This document was last updated on **4 April 2025**.

1 ASET

April 2024 – Paper A solutions

Solution 7, part (ii), page 46 ***(added on 26 February 2025)***

There is a typo in the final expression for $E[X_t e_{t-k}]$ at the top of the page. It should be:

$$E[X_t e_{t-k}] = a^2 E[X_t e_{t-(k-2)}] = \ldots = a^{k-1} E[X_t e_{t-1}] = a^{k-1}\left((a+b)\sigma^2 + \frac{\sigma^4}{1-a}\right)$$

September 2023 – Paper A solutions

Solution 1, part (ii), page 3 ***(added on 4 April 2025)***

There is a typo in the final calculation of the expected number of people at the next dinner. It should be:

$$3 \times 0.98163 + 8 \times 0.98166 + 18 \times 0.98169 = 28.47$$

There is also the same typo in the Excel screenshot in the box that follows. It should be:

	A	B	C	D
1	B	0.0045		
2	c	1.0004		
3	g	=EXP(-B/LN(_c))		
4				
5	x	64	68	72
6	t	4	4	4
7	tpx	=g^(_c^B5*(_c^B6-1))	=g^(_c^C5*(_c^C6-1))	=g^(_c^D5*(_c^D6-1))
8				
9	members	18	8	3
10	expected	=B9*B7	=C9*C7	=D9*D7
11	total	=SUM(B10:D10)		

2 Assignments

Assignment X5 Solutions

Solution X5.2, page 2 ***(added on 26 February 2025)***

Below is another way to calculate $E(Y)$ using the alternative formula given in equation 18.2 in Chapter 18.

We have:

$$E(Y) = \int_0^{80} P(X > x)\,dx$$

$$= \int_0^{80} \left(\frac{20}{20+x}\right)^3 dx$$

$$= 20^3 \int_0^{80} \frac{1}{(20+x)^3}\,dx$$

$$= 20^3 \left[-\frac{1}{2}\frac{1}{(20+x)^2}\right]_0^{80}$$

$$= 20^3 \left[-\frac{1}{2}\frac{1}{(20+80)^2} + \frac{1}{2}\frac{1}{20^2}\right]$$

$$= 9.6$$

Solution X5.3, page 3 ***(added on 26 February 2025)***

Below is another way to calculate $E(Y)$ using the alternative formula given in equation 18.2 in Chapter 18.

We have:

$$E(Y) = \int_0^{200} P(X > x)\,dx$$

$$= \int_0^{200} e^{-0.01x}\,dx$$

$$= \left[-\frac{1}{0.01}e^{-0.01x}\right]_0^{200}$$

$$= -\frac{1}{0.01}(e^{-0.01\times 200} - 1)$$

$$= 86.466$$

Solution X5.8, part (i)(b) page 17 ***(added on 26 February 2025)***

Below is another way to calculate $E(Y)$ using the alternative formula given in equation 18.2 in Chapter 18.

We have:

$$E(Y) = \int_0^{3,000} P(X > x)\,dx$$

$$= \int_0^{3,000} \frac{7,500^4}{(7,500+x)^4}\,dx$$

$$= \left[-\frac{1}{3}\frac{7,500^4}{(7,500+x)^3} \right]_0^{3,000}$$

$$= -\frac{1}{3}\left[\frac{7,500^4}{(7,500+3,000)^3} - 7,500 \right]$$

$$= 1,588.92$$

3 Handouts

Day 1 Handouts – Questions

Question 13, page 12 ***(added on 26 February 2025)***

The games in this question are stated in the incorrect order. It should read:

Two siblings are playing a series of games of chess (C), backgammon (B) and draughts (D). Whoever wins the game in any particular round gets to pick which game they play next. The probability that the first sibling beats the second is 20%, 50% and 40% for chess, backgammon, and draughts, respectively.

4 PBOR

Chapter 16 – Measures of tail weight – Course Notes

Example 2, page 6 ***(added on 26 February 2025)***

There is a typo in the final sentence of the question. It should say:

Calculate the hazard rate for $x=3$.

5 Course Notes

Chapter 13

Section 2.5, page 18 ***(added on 4 April 2025)***

There are two typos in the final paragraph on this page. It should read:

The formula for calculating ϕ_k involves a ratio of determinants of large matrices whose entries are determined by $\rho_1,\ldots,\rho_k$; it may be found in standard works on time series analysis, and is readily available in common computer packages like R.