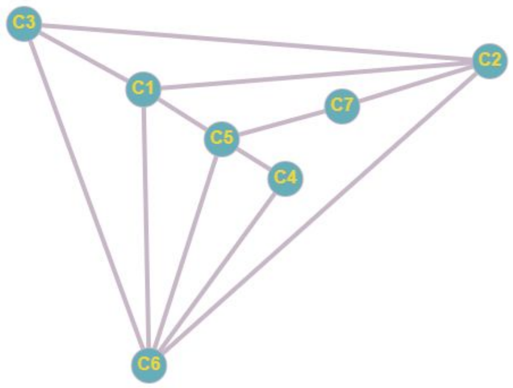
A3.1

Graph G has vertices $\{C_1, C_2, \ldots, C_7\}$ and edges between C_i and C_j if $C_i \cap C_j \neq \varnothing$ for $\{i, j \in [1, 7], i \neq j\}$. If G can be coloured with 4 or less colours then all classes can be timetabled on the same day.



A3.2

Vertices are visited in the order C_1, C_2, C_3, C_5, C_4, C_6, C_7 using algorithm A2

A3.3

Vertex	C_1	C_2	C_3	C_4	C_5	C_6	C_7
Colour	1	2	3	1	2	4	1

A3.4

$_x(G) \neq 1$ since any two vertices with a connecting edge need to be different colours.
$_x(G) \neq 2$ since C_1, C_2 and C_3 require 3 different colours as they are all connected to each other.
$_x(G) \neq 3$ since C_1, C_2, C_3 and C_6 require 4 different colours as they are all connected to each other.
$_x(G) = 4$ as shown by A3.3.