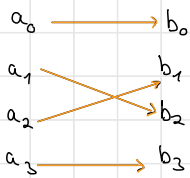
Problemset 9

Exercise 6:

a) G_4:



$M = \{(a_0, b_0), (a_1, b_2), (a_2, b_1), (a_3, b_3)\}$ is a perfect matching.

G_5:

$i = 0$ $\quad a_i = a_0$

b_j : $\quad j = 2i \bmod n$

$= 2 \cdot 0 \bmod 5 = 0$

$b_j = b_0$

$i = 1$ $\quad a_i = a_1$

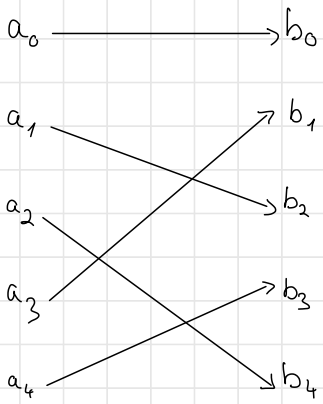
b_j : $\quad j = 2i \bmod n$

$= 2 \cdot 1 \bmod 5 = 2$

$b_j = b_2$

...

Graph:

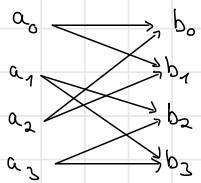


$M = \{(a_0, b_0), (a_1, b_2), (a_2, b_4), (a_3, b_1), (a_4, b_3)\}$

is a perfect matching

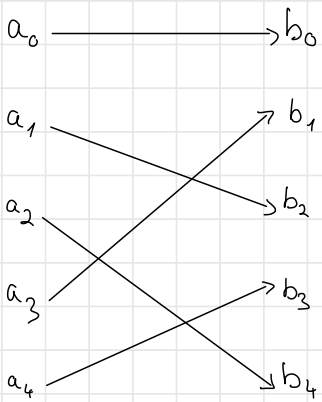
b) With the formula: $\frac{n!}{\left(\frac{n}{2}\right)!^2}$

- G_4 has 6 perfect matchings



$$\frac{4!}{\left(\frac{4}{2}\right)!^2} = 6$$

- G_5 has 10 perfect matchings



$$\frac{5!}{\left(\frac{5}{2}\right)!^2} = 10$$