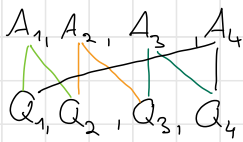


## Exercise 8



budget = 3

$\nabla A_1$  beats  $A_2$

$\Rightarrow Q_1, Q_2, Q_3, Q_3, Q_1, Q_2, Q_3, Q_1, Q_4, Q_1, Q_4$

a) • Sequence of advertisers:

$A_1, A_2, A_3, A_2, A_4, A_1, A_3, A_4, A_3, A_1, A_4$

• Competitive ratio:  $\frac{11}{11} = 1$

$\hookrightarrow$  because the maximum budget we can earn with the given queries is 11 and we got a budget of 11 with the BALANCE Algorithm