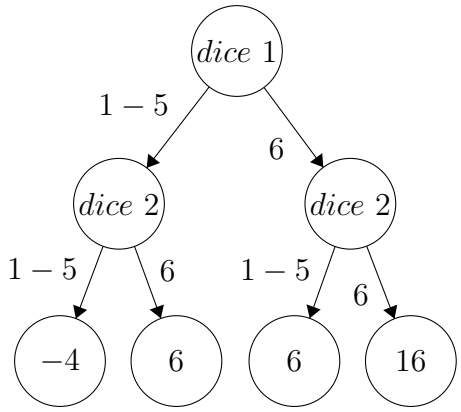
Exercise 1a



There exists a chance of $(\frac{5}{6})^2 = 69\%$ of losing if you only play once.
If you decide to play twice your chances of losing money drop below 50% to $(\frac{5}{6})^4 = 48\%$, making it a fair game for you.
The average expected income per game is $E(w) = (\frac{5}{6})^2 \cdot (-4) + 2 \cdot \frac{5}{6} \cdot \frac{1}{6} \cdot 6 + (\frac{1}{6})^2 \cdot 16 = 1.56$ Euro.

Exercise 1b

Prisoner A \Prisoner B	**Schnitches on A**	**Stays silent**
Snitches on B	3 Yrs \3 Yrs	0 Yrs \5 Yrs
Stays silent	5 Yrs \0 Yrs	0.5 Yrs \0.5 Yrs

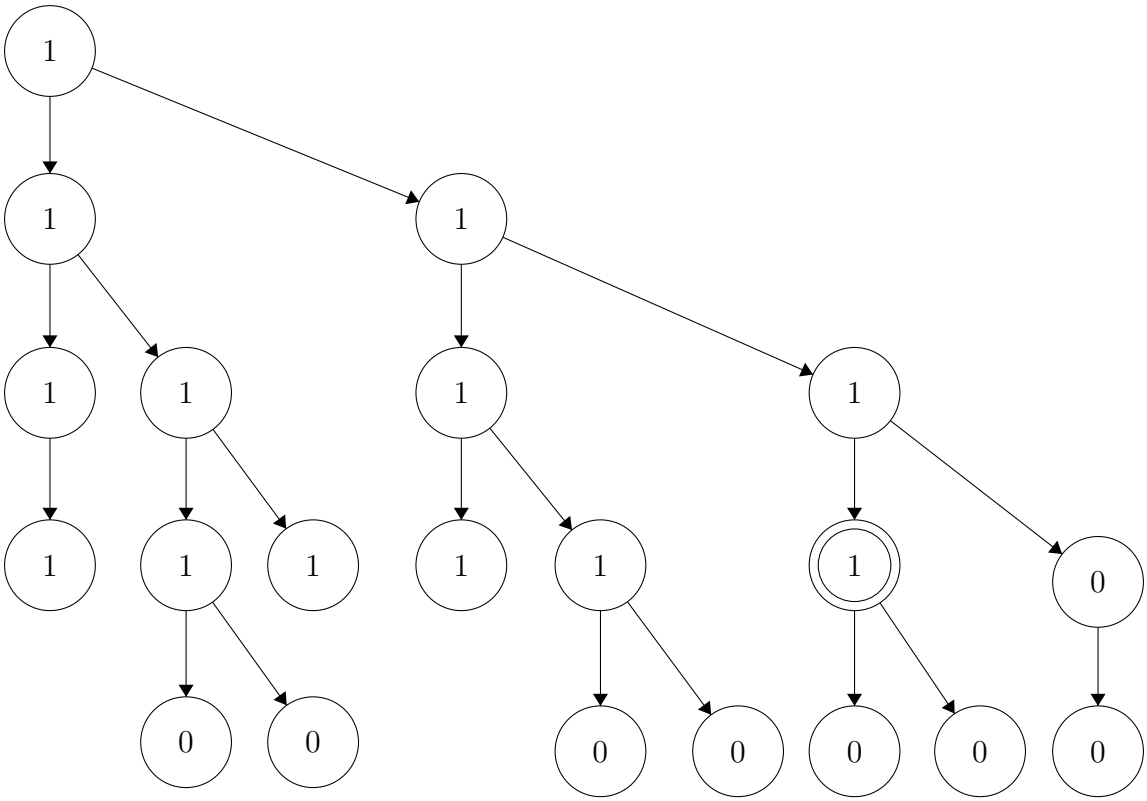
Tabelle 1: Prison sentences

- Both agents try to minimize the time they both spend in prison.
- Both know that snitching on the other would reduce their prison sentence by a reasonable amount
- Both also know that the other prisoner has the same incentive to snitch on the other. This would mean 5 years if one was silent.
- Therefore both have an active incentive to snitch on the other even if it means that the highest prison time overall is reached

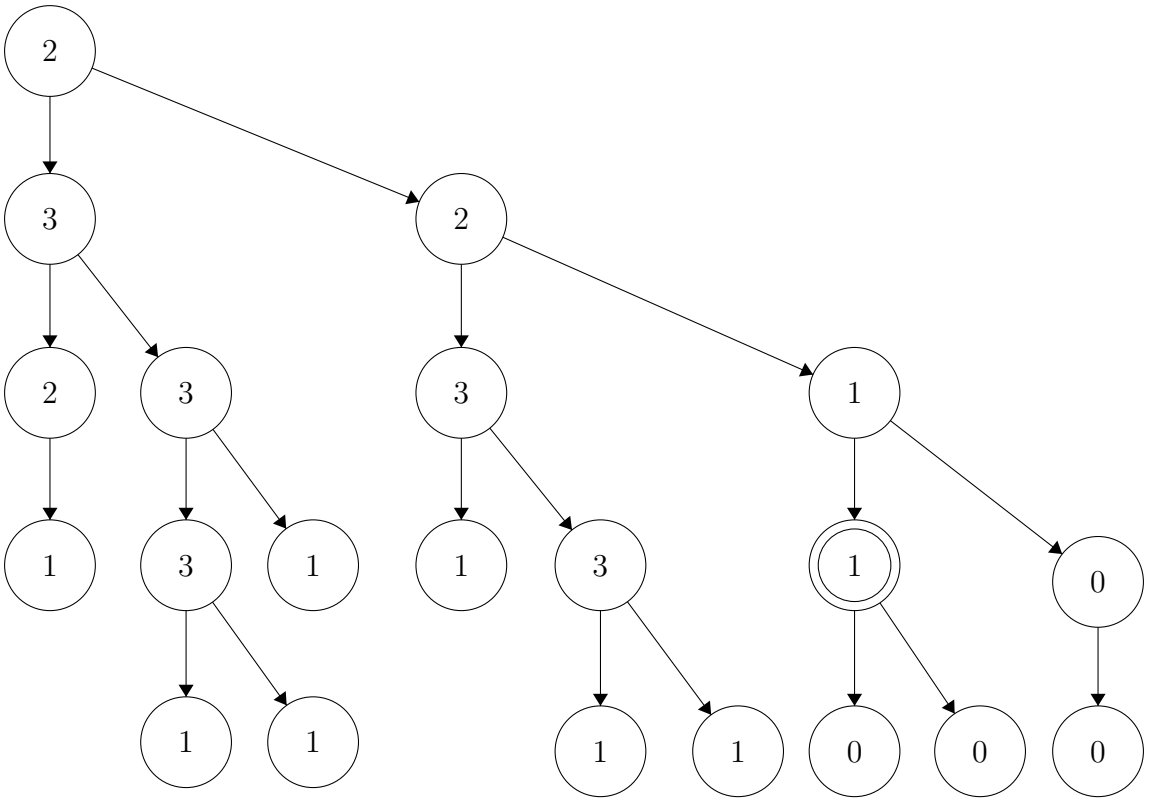
$\Rightarrow$ the output that is reached is 3 years for both prisoners.

- Solutions for this problems are loyalty, cooperation or treaties between parties. All of them are illegitimate in this case.

Exercise 2a BFS



Exercise 2b DFS



Exercise 2c DFIDF