Universität Zürich[UZH]

Introduction to Artificial Intelligence
Exercise Sheet 9

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Exercise 9.1

(a)

We assume that for the population of prawns x numbers to commercialize is y $\leq$ x and number to reproduce is z = x-y.

The variables for $\mathbb{M} = \langle$S, A, T, R, $s_0, \gamma\rangle$ are:

s_0 = 1000N

R(s_j, a, s_j) = 10y = 10(x-z) = 10a

$\gamma = 0.5$

S = {x | x $\in$ N, $0 \leq x \leq N$}

A = {n | n $\in$ N, $0 \leq n \leq N$}

T(s_j, a, s_j) = 0, $s_j <$ a

T(s_j, a, 2(s_j-a)) = 0.7

T(s_j, a, 4(s_j-a)) = 0.2

T(s_j, a, 0.5(s_j-a)) = 0.1

b) If we increase the discount factor γ the decay will be slower for future rewards. Meaning we value future rewards more in comparison to before we increased the discount factor. The optimal policy changes in the regard that we sell less now and keep more N for reproduction.

Exercise 9.2

Exercise 9.3