

Solutions Attendance Quiz for Lecture 10 of Dr. Z.'s Dynamical Models in Biology class

Name: Dr. Z.

1. What is the probability of exiting a winner in a Gambler's ruin with max. capital 1000, and starting with 300 dollars for each of the following probability of winning a dollar in a single round.

$$p = 0.4 + 0.01 \cdot i \quad , \quad i = 5..15$$

(give all 11 numbers, it is OK to give a list of 11 numbers)

Sol. to 1: You use `EstPD(n,L,p)[1]` in the Maple file `DMB10.txt`:

```
seq(evalf(ExactPD(300,1000,4/10+1/100*i)[1]),i=5..15);
```

2. What is the expected duration of exiting a winner in a Gambler's ruin with max. capital 1000, and starting with 300 dollars for each of the following probability of winning a dollar in a round.

$$p = 0.4 + 0.01 \cdot i \quad , \quad i = 5..15$$

Sol. to 2: You use `EstPD(n,L,p)[2]` in the Maple file `DMB10.txt`:

```
seq(evalf(ExactPD(300,1000,4/10+1/100*i)[2]),i=5..15);
```

Comments: Many people got correctly(!) the nonsense answer that for $p > \frac{1}{2}$ there is a negative expected duration. My bad! This means that the formula that I coded is not valid for $p > \frac{1}{2}$. I hope to fix this bug in the weekend.