Natural Computing, Assignment 3

Dennis Verheijden - s4455770 Pauline Lauron - s1016609
Joost Besseling - s4796799

March 23, 2018

1

1.a

- The probability that all three doctors give the correct answer is $0.8^3 = 0.512$.
- The probability that exactly 2 doctors make the right call is $0.8 * 0.8 * 0.2 + 0.8 * 0.2 * 0.8 + 0.2 * 0.8 * 0.8 = 0.384$. Therefore, the probability that *at least* two doctors make the right call is $0.512 + 0.384 = 0.896$.
- The probability that this group makes the right decision based on majority voting is $0.512 + 0.384 = 0.896$.

1.b

The general formula is

$$P(\text{correct predictions} > c/2) \sum_{i=\lfloor n/2 \rfloor}^{n} p^i (1-p)^{n-i} \binom{n}{i}.$$

Using this formula, we find a probability of about 0.826.

1.c

If we use 10000 runs of the simulations, we get an approximately equal result.
(TODO !!!!) (DO SOMETHING WITH HOW APPROXIMATELY?)

1.d