

AARHUS UNIVERSITY

COMPUTER-SCIENCE

INTRODUCTION TO PROBABILITY AND STATISTICS

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# Handin 1

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**Problem 28:** In a factory there are 100 units of a certain product, 5 of which are defective. We pick three units from the 100 units at random. What is the probability that exactly one of them is defective?

Let's look at the numbers we have.

Let our total number of units be  $N = 100$

Let our defects be  $b = 5$

Let the number of units we pick be  $k = 3$

Let the number of defects we want be  $x = 1$

Let our functional units be  $r = 95$

Since we have a finite sample, without replacements, we will use the formula for hypergeometric distribution given in definition [3.8][1].

$$\frac{\binom{5}{1} \binom{95}{2}}{\binom{100}{3}}$$

Check with an instructor?

## References

- [1] Hossein Pishro-Nik. *Introduction to Probability, Statistics and Random Processes*. Kappa Research, LLC, 2014.