

SPAB – assignment 01

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Task 1.1

3 : 0.0021
4 : 0.0063
5 : 0.0125
6 : 0.0208
7 : 0.0292
8 : 0.0375
9 : 0.0437
10: 0.0479
11: 0.0500
12: 0.0500
13: 0.0500
14: 0.0500
15: 0.0500
16: 0.0500
17: 0.0500
18: 0.0500
19: 0.0500
20: 0.0500
21: 0.0500
22: 0.0500
23: 0.0479
24: 0.0437
25: 0.0375
26: 0.0292
27: 0.0208
28: 0.0125
29: 0.0063
30: 0.0021

Task 1.2

We are concerned about 3 cases:

Case 1: 4 correct

$$\binom{6}{4} = \text{drawn 4 from 6 correct}$$

$$\binom{49-6}{2} = \binom{43}{2} = \text{drawn 2 from 43 false}$$

Case 2: 5 correct

$$\binom{6}{5} = \text{drawn 5 from 6 correct}$$

$$\binom{49-6}{1} = \binom{43}{1} = \text{drawn 1 from 43 false}$$

Case 3: 6 correct

$$\binom{6}{6} = \text{drawn 6 from 6 correct}$$

$$\binom{49-6}{0} = \binom{43}{0} = \text{drawn no false}$$

We calculate $P(|G \cap D|)$

$$\begin{aligned} & \frac{\overset{\text{case 1}}{\binom{6}{4}} \binom{43}{2} + \overset{\text{case 2}}{\binom{6}{5}} \binom{43}{1} + \overset{\text{case 3}}{\binom{6}{6}} \binom{43}{0}}{\binom{49}{6}} \\ &= \frac{15 \cdot 903 + 6 \cdot 43 + 1 \cdot 1}{1,3983816 \cdot 10^7} = 0,00099 \end{aligned}$$

Task 1.3

1 $1 \cdot \frac{4}{6} \cdot \frac{3}{6} \cdot \frac{2}{6} = \frac{2}{9}$

2 $\prod_{i=1}^{30} \frac{i}{30} = 1,2883 \cdot 10^{-12}$

3 $\binom{200}{10} = 2,2451 \cdot 10^{16}$

4 $n^k = 32^{10}$

Task 1.4

$n = 250, k = 200$

ntuples:

[illegible]

npermutations:

106294678571149534187136223373463438083767233117329258664671946099578173382913989
564795561575544292590439073463173048594121380981816849701237862063359376330185033
919968207829405807347583840298946551495400220238222816514991286660449695981231098
753830431348335759736287423686886467714220973467157522741831027866313330767213894
761439193185130767899443487157496274223278625424565862400000000000000000000000
0000000000000000000000

ncombinations:

134779202705884333073115306260788792805547398513295360

nmultisets:

377696897811976369406704033241764114346820044877388329012133081819520273264792025
3843700888040607432069236736663438410440973496614912