$\to X_1, \dots, X_n$ indep. in B $\sim \nu(\cdot)$

6. Let Φ be a binomial point process with n points in B and the measure ν. Determine the covariance $\operatorname{cov}(\Phi(B_1), \Phi(B_2))$ for $B_1, B_2 \in \mathcal{B}$.

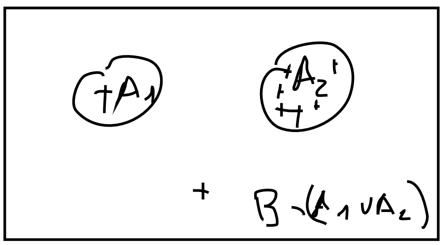
as in previous exercise:

$$\operatorname{cov}(\Phi(B_1), \Phi(B_2)) = \operatorname{cov}(\Phi(B_1 \setminus B_2), \Phi(B_1 \cap B_2)) +$$

$$+ \operatorname{cov}(\Phi(B_1 \setminus B_2), \Phi(B_2 \setminus B_1)) + \operatorname{cov}(\Phi(B_1 \cap B_2), \Phi(B_2 \setminus B_1)) + \operatorname{var} \Phi(B_1 \cap \dots$$

A_1, A_2 disjoint:

$$\operatorname{cov}(\Phi(A_1), \Phi(A_2)) = -n \cdot \frac{\nu(A_1)}{\nu(B)} \cdot \frac{\nu(A_2)}{\nu(B)} \quad \Big| \quad \operatorname{var} \Phi(A) = n \frac{\nu(A)}{\nu(B)} \Big(1 - \dots$$



$$(\Phi(A_1), \Phi(A_2), \Phi(B \setminus (A_1 \cup A_2)))$$

$$\sim M\Big(n; \Big(\frac{\nu(A_1)}{\nu(B)}, \frac{\nu(A_2)}{\nu(B)}, 1 - \dots$$

$\nu(B_2)$

$$\dots = -\frac{n}{\nu(B)^2} \Big[\nu(B_1 \setminus B_2) \cdot \nu(B_1 \cap B_2) + \nu(B_1 \setminus B_2) \nu(B_2 \setminus B_1) + \nu(B_1 \cap B_2) \cdot \nu(B_2 \setminus \dots$$

$$- \nu(B_1 \cap B_2)(\nu(B) - \nu(B_1 \cap B_2)) \Big] =$$

$$= -\frac{n}{\nu(B)^2} \Big[\nu(B_1 \setminus B_2) \cdot \nu(B_2) + \nu(B_1 \cap B_2) \cdot \nu(B_2) - \nu(B) \nu(B_1 \cap B_2) \dots$$

$$= -\frac{n}{\nu(B)^2} \Big[\nu(B_1) \nu(B_2) - \nu(B) \nu(B_1 \cap B_2) \Big].$$