Chapter 12

Group Assignments

12.1 Group Assignment 1

- Prove Lemma 1.14
- Prove Lemma 2.8
- Prove property 4 of Theorem 2.18
- Solve Exercise 2.59
- Prove the "tower property" (Theorem 2.60) for a discrete random variable taking a finite number of values.

12.2 Group Assignment 2

- Prove Corollary 3.7.
- Prove Lemma 3.15, properties 1-4.
- Solve Exercise 3.16
- Solve Exercise 4.7
- Prove Theorem 4.9 with all details, basically referring to all the properties of the indicator function used, the monotonicity of measures etc.

12.3 Group Assignment 3

- Solve Exercise 5.20
- Solve Exercise 6.11

- Solve Exercise 6.19
- Solve Exercise 7.12
- Solve Exercise 7.17

Bibliography

[BlHo] Blum, A., Hopcroft, J., and Kannan, R. *Foundations of data science.* Cambridge University Press, 2020.

[BLM] Boucheron, S., Lugosi, G., Massart, P. *Concentration inequalities: a nonasymptotic theory of independence*, Oxford University Press, 2013.

[PTPR] Devroye, L., Gyorfi, L. and Lugosi, G., *A Probabilistic Theory of Pattern Recognition*, Springer 1997

[HD] T. E. Hull and A. R. Dobell, *Random Number Generators*, SIAM Review 1962 4:3, 230-254

[K] Knuth, Donald (1997). Seminumerical Algorithms. The Art of Computer Programming. 2 (3rd ed.). Reading, MA: Addison-Wesley Professional. pp. 10–26.

[ReWa] Reiß, M., and Wahl, M. *Nonasymptotic upper bounds for the reconstruction error of PCA.* The Annals of Statistics 48.2 (2020): 1098-1123.

[SLT] Vapnik, V. , *Statistical Learning Theory*, Wiley, 1998.

[WW] M. Wainwright, *High-Dimensional Statistics: A Non-Asymptotic Viewpoint*, 2019.

[W] Wasserman, L. All of Statistics. Springer Texts in Statistics, Springer, 2004.

Index