

MAT315 Combinatorial Enumeration
Monsoon 2024

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Preface

These are the lecture notes of MAT315 Combinatorial Enumeration, offered in Monsoon 2024 semester at Ahmedabad University, India. The notes were written down by the TA for the course, Kanak Dhotre and is as close to the classroom teaching as possible.

If there are any errors, comments, or corrections, please write to me via email.

Manjil Saikia

CHAPTER 1

What is Combinatorics?

- (1) This is a non-local test commit made by Kanak via GitHub on 30th July 2:03pm.
- (2) This is a local test commit made by Kanak via GitHub on 30th July 2:15pm.
- (3) This is a local test commit made by Kanak via Github on 30th July 2:16pm to check if the .vimrc is working. $2 + 2 = 4$.
- (4) This is a non-local test commit made by Kanak via Overleaf on 30th July 4:27pm to check if the GitHub .yml worker is indeed working. **[FAILED]**
- (5) This is a non-local test commit made by Kanak via Overleaf on 30th July 4:47pm to check if the GitHub .yml worker is indeed working.

CHAPTER 2

The Art of Bijections

CHAPTER 3

Generating Functions

CHAPTER 4

Integer Partitions

CHAPTER 5

Lattice Path Combinatorics

CHAPTER 6

A Combinatorial Miscellany

Bibliography

- [A] T. Aoki, *Calcul exponentiel des opérateurs microdifférentiels d'ordre infini*. I, Ann. Inst. Fourier (Grenoble) **33** (1983), 227–250.
- [B] R. Brown, *On a conjecture of Dirichlet*, Amer. Math. Soc., Providence, RI, 1993.
- [D] R. A. DeVore, *Approximation of functions*, Proc. Sympos. Appl. Math., vol. 36, Amer. Math. Soc., Providence, RI, 1986, pp. 34–56.