Review

- Counting (Stirling Number of the 2nd kind)
- Binomial Thm (Newton's .. ..)

  $(1+x)^n = \sum_{k=0}^{n} \binom{n}{k} x^k \Rightarrow (1+x)^r = \sum_{k=0}^{+\infty} \binom{r}{k} x^k$, $x \in (-1, 1)$, $\binom{r}{k} = \frac{r(r-1)\cdots(r-k+1)}{k!}$
- Estimating ($n!$, $\left(\frac{n}{k}\right)^k \le \binom{n}{k} \le \left(\frac{en}{k}\right)^k$)
- Iclusion - Exclusion (Derangements, ...
- G.F. (Recurrence Relations, Intege Partition, Catlan Num, Random Walk ..
- Exponential G.F.
- Basic of Graph Theory.
- Double - Counting

  - Handshaking Lemma
  - Sperner's Lemma
  - Brouwer's Fixed Point Thm
  - Sperner's Thm (Independent System). Proof 1, 2.

  Maximum Number of edges in graphs NOT containing C_4.

  Maximum .. .. C_3. (Mentel's Thm).
- Cayley's Formula (Proof 1, 2, 3).