

$$CG_n = \sum_{i=1}^n rel_i \quad (\text{Where } rel_i \text{ is the graded relevance of the document at position } i)$$

$$DCG_n = rel_1 + \sum_{i=2}^n \frac{rel_i}{\log_2 i}$$

$$NDCG_n = \frac{DCG_n}{IDCG_n} \quad (\text{Normalize by DCG of the ideal ranking})$$