Topic 1: Foreign Key Constraint

* <https://dba.stackexchange.com/questions/274407/is-the-foreign-key-automatically-indexed-in-mysql>
* <https://stackoverflow.com/questions/304317/does-mysql-index-foreign-key-columns-automatically>

Topic 2: Collection Time -> Datetime?

Topic 3: URL column -> 30514, URL 29362의 이득: 83,760

(30514-29362 \* 255) - 160000 - 30000 × 1 - 20000 × 1

Hash key -> 30782

Collection time -> 11026: 빼기

File -> 13075

File\_download -> 12495 빼기 X

File\_id -> 12577 빼기 X

Document -> 30514, 30782

Topic 4.Sequence of Join (?)

1. Simplified conditions:
   * In the original query, the JOIN conditions involve multiple comparisons using OR and IS NULL checks. This can make the query more complex and harder to optimize.
   * In the optimized query, the conditions are simplified using the COALESCE function. COALESCE replaces NULL values with the specified default value (in this case, an empty string ''), allowing direct equality comparisons. This simplifies the conditions and makes the query more readable.
2. Efficient NULL handling:
   * The original query uses explicit NULL checks (e.g., k.file\_name IS NULL AND f.file\_name IS NULL) to handle NULL values in the JOIN conditions.
   * The optimized query leverages the COALESCE function to handle NULL values more efficiently. COALESCE replaces NULL values with the default value provided (empty string ''), allowing direct equality comparisons without explicit NULL checks. This simplifies the conditions and can potentially improve performance.

Overall, the optimized query achieves the same result as the original query but with simplified and more efficient conditions. It should be easier to understand, maintain, and potentially perform better due to the improved handling of NULL values and simplified comparisons.

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