

DBMS PROJECT FUNCTIONAL DEPEDANCIES

COMPETITIVE_PROGRAMMING_PLATFORM

1. USER (HANDLE(USERNAME), MAIL, FIRST_NAME, MIDDLE_NAME, LAST_NAME, BIRTH_DATE, GENDER, REGISTER_DATE, ORGANIZATION_NAME, CITY, COUNTRY, RATING)
 - HANDLE \rightarrow {MAIL, FIRST_NAME, MIDDLE_NAME, LAST_NAME, BIRTH_DATE, GENDER, REGISTER_DATE, ORGANIZATION_NAME, CITY, COUNTRY, RATING}
 - MAIL \rightarrow {HANDLE, FIRST_NAME, MIDDLE_NAME, LAST_NAME, BIRTH_DATE, GENDER, REGISTER_DATE, ORGANIZATION_NAME, CITY, COUNTRY, RATING}

Keys: {HANDLE}, {MAIL}

So, both are in BCNF.

2. REGISTER_IN (HANDLE(USERNAME), CONTEEST_ID, REGISTRATION_DATE_TIME, DISQUALIFIED_FLAG, START_RATING, END_RATING)
 - {HANDLE, CONTEST_ID} \rightarrow {REGISTRATION_DATE_TIME, DISQUALIFIED_FLAG, START_RATING, END_RATING}

Key: {HANDLE, CONTEST_ID}

So, it is in BCNF.

3. CONTEST (CONTEST_ID, CONTEST_NAME, START_DATE_TIME, END_DATE_TIME, PRIZE)
 - CONTEST_ID \rightarrow {CONTEST_NAME, START_DATE_TIME, END_DATE_TIME, PRIZE}
 - {CONTEST_NAME, START_DATE_TIME} \rightarrow {CONTEST_ID, END_DATE_TIME, PRIZE}
 - {CONTEST_NAME, END_DATE_TIME} \rightarrow {CONTEST_ID, START_DATE_TIME, PRIZE}
 - {CONTEST_NAME, START_DATE_TIME, END_DATE_TIME} \rightarrow {CONTEST_ID, PRIZE}

Keys: {CONTEST_ID}, {CONTEST_NAME, START_DATE_TIME}, {CONTEST_NAME, END_DATE_TIME}, {CONTEST_NAME, START_DATE_TIME, END_DATE_TIME}

So, every FDs are in BCNF.

4. QUESTIONS (QUESTION_ID, CONTEST_ID, CREATION_DATE_TIME, DIFFICULTY_LEVEL, MAXIMUM_SCORE, CREATOR_ID, PRACTICE_SET_STATUS, TEST_CASES)
 - {CONTEST_ID, QUESTION_ID} \rightarrow {CREATOR_ID, CREATION_DATE_TIME, DIFFICULTY_LEVEL, MAXIMUM_SCORE, PRACTICE_SET_STATUS, TEST_CASES}

Key: {CONTEST_ID, QUESTION_ID}

So, it is in BCNF.

5. HAS_MEDAL (HANDLE(USERNAME), CONTEST_ID, MEDAL_TYPE)

- {HANDLE, CONTEST_ID} → {MEDAL_TYPE}

Key: {HANDLE, CONTEST_ID}

So, it is in BCNF.

6. LEADERBOARD (HANDLE(USERNAME), CONTEST_ID, STANDING, SCORE)

- {HANDLE, CONTEST_ID} → {STANDING, SCORE}

Key: {HANDLE, CONTEST_ID}

So, it is in BCNF.

7. DISCUSSION (DISCUSSION_ID, QUESTION_ID, CONTEST_ID, HANDLE(USERNAME), DISCUSSION_DATE_TIME, COMMENT)

- {DISCUSSION_ID, CONTEST_ID, QUESTION_ID} → {HANDLE(USERNAME), DISCUSSION_DATE_TIME, COMMENT}
- {HANDLE(USERNAME), DISCUSSION_DATE_TIME, COMMENT} → {DISCUSSION_ID, CONTEST_ID, QUESTION_ID}

Keys: {DISCUSSION_ID, CONTEST_ID, QUESTION_ID}, {HANDLE(USERNAME), DISCUSSION_DATE_TIME, COMMENT}

So, both are in BCNF.

8. EDITORIAL (EDITORIAL_ID, QUESTION_ID, CONTEST_ID, DATA, CODE)

- {EDITORIAL_ID, QUESTION_ID, CONTEST_ID} → {DATE, CODE}

Key: {EDITORIAL_ID, QUESTION_ID, CONTEST_ID}

So, it is in BCNF.

9. STATUS_TITLE (TITLE, START_RATING_RANGE, END_RATING_RANGE)

- TITLE → {START_RATING_RANGE, END_RATING_RANGE}
- {START_RATING_RANGE, END_RATING_RANGE} → {TITLE}

Key: {TITLE}, {START_RATING_RANGE, END_RATING_RANGE}

So, both are in BCNF.

10. SUBMISSION (SUBMISSION_ID, CONTEST_ID, QUESTION_ID, HANDLE(USERNAME), LANGUAGE, SUBMISSION_DATE_TIME, STATUS, MEMORY, RUN_TIME, PASS_CASES, SCORE)

- SUBMISSION_ID → {CONTEST_ID, QUESTION_ID, HANDLE(USERNAME), LANGUAGE, SUBMISSION_DATE_TIME, STATUS, MEMORY, RUN_TIME, PASS_CASES, SCORE}
- {CONTEST_ID, QUESTION_ID, HANDLE, SUBMISSION_DATE_TIME} → {SUBMISSION_ID, LANGUAGE, STATUS, MEMORY, RUN_TIME, PASS_CASES, SCORE}

Keys: {SUBMISSION_ID}, {CONTEST_ID, QUESTION_ID, HANDLE, SUBMISSION_DATE_TIME}

So, both are in BCNF.

11. HAS_CATAGORY (CONTEST_ID, QUESTION_ID, CATAGORY_NAME)
12. PROGRAMMS_IN (HANDLE(USERNAME), LANGUAGE, VERSION)
13. FOLLOWS (HANDLE(USER), HANDLE(FOLLOWER))