**Query 1**

Top 10 Customers with Failed Logins (Last 7 Days).

mysql> SELECT

-> cd.party\_id,

-> cd.phone\_number,

-> COUNT(\*) AS failed\_logins

-> FROM

-> customer\_data cd

-> JOIN

-> login\_instance\_data lid ON cd.party\_id = lid.party\_id

-> WHERE

-> lid.successful = FALSE

-> AND lid.timestamp >= CURRENT\_DATE - INTERVAL 7 DAY

-> GROUP BY

-> cd.party\_id, cd.phone\_number

-> ORDER BY

-> failed\_logins DESC

-> LIMIT 10;

+----------+------------------------+---------------+

| party\_id | phone\_number | failed\_logins |

+----------+------------------------+---------------+

| 654523 | 001-660-812-7055 | 1 |

| 223412 | 910-639-0985x2741 | 1 |

| 279414 | (402)871-4283x9752 | 1 |

| 435649 | 001-666-223-7582x57173 | 1 |

| 289061 | (768)821-8083x165 | 1 |

| 142347 | 662.238.2923 | 1 |

| 426751 | (352)203-5192x303 | 1 |

| 959182 | 001-732-358-3861x269 | 1 |

| 284063 | 400.535.1056 | 1 |

| 363028 | 522-294-5682x417 | 1 |

+----------+------------------------+---------------+

10 rows in set (0.01 sec)

**Query 2**

List all customers with more than 1 account and show their party ID and number of accounts.

mysql> SELECT

-> cad.party\_id,

-> COUNT(DISTINCT cad.account\_id) AS num\_accounts

-> FROM

-> customer\_account\_data cad

-> GROUP BY

-> cad.party\_id

-> HAVING

-> COUNT(DISTINCT cad.account\_id) > 1

-> ORDER BY

-> num\_accounts DESC;

+----------+--------------+

| party\_id | num\_accounts |

+----------+--------------+

| 918807 | 8 |

| 354993 | 7 |

| 517213 | 7 |

| 899690 | 7 |

| 204417 | 6 |

| 435649 | 6 |

| 553606 | 6 |

| 630171 | 6 |

| 784246 | 6 |

| 846102 | 6 |

| 124876 | 5 |

| 142537 | 5 |

| 145270 | 5 |

| 178476 | 5 |

| 278362 | 5 |

| 339643 | 5 |

| 353168 | 5 |

| 405144 | 5 |

| 489089 | 5 |

| 510987 | 5 |

| 736402 | 5 |

| 768390 | 5 |

| 841384 | 5 |

| 912674 | 5 |

| 161769 | 4 |

| 165878 | 4 |

| 176588 | 4 |

| 185131 | 4 |

| 211347 | 4 |

| 267355 | 4 |

| 285598 | 4 |

| 307937 | 4 |

| 374452 | 4 |

| 482841 | 4 |

| 496323 | 4 |

| 524726 | 4 |

| 550379 | 4 |

| 576134 | 4 |

| 627699 | 4 |

| 642667 | 4 |

| 690831 | 4 |

| 702347 | 4 |

| 703047 | 4 |

| 707848 | 4 |

| 766398 | 4 |

| 823236 | 4 |

| 831142 | 4 |

| 848469 | 4 |

| 870797 | 4 |

| 891092 | 4 |

| 918904 | 4 |

| 932942 | 4 |

| 933473 | 4 |

| 942532 | 4 |

| 957476 | 4 |

| 957570 | 4 |

| 120373 | 3 |

| 136888 | 3 |

| 142347 | 3 |

| 152017 | 3 |

| 173743 | 3 |

| 183720 | 3 |

| 192141 | 3 |

| 221412 | 3 |

| 222328 | 3 |

| 225009 | 3 |

| 245284 | 3 |

| 263426 | 3 |

| 265756 | 3 |

| 273148 | 3 |

| 279414 | 3 |

| 284063 | 3 |

| 328815 | 3 |

| 381705 | 3 |

| 385804 | 3 |

| 426751 | 3 |

| 437427 | 3 |

| 455782 | 3 |

| 467418 | 3 |

| 510757 | 3 |

| 531846 | 3 |

| 542389 | 3 |

| 544683 | 3 |

| 545031 | 3 |

| 560657 | 3 |

| 638387 | 3 |

| 654523 | 3 |

| 693875 | 3 |

| 695822 | 3 |

| 730556 | 3 |

| 753483 | 3 |

| 764417 | 3 |

| 791592 | 3 |

| 796365 | 3 |

| 802344 | 3 |

| 806515 | 3 |

| 857288 | 3 |

| 860481 | 3 |

| 882208 | 3 |

| 927372 | 3 |

| 968810 | 3 |

| 107171 | 2 |

| 118675 | 2 |

| 127697 | 2 |

| 137895 | 2 |

| 140937 | 2 |

| 156059 | 2 |

| 166701 | 2 |

| 183571 | 2 |

| 191947 | 2 |

| 192453 | 2 |

| 206328 | 2 |

| 210200 | 2 |

| 231918 | 2 |

| 239917 | 2 |

| 246651 | 2 |

| 278745 | 2 |

| 289061 | 2 |

| 298585 | 2 |

| 302361 | 2 |

| 332361 | 2 |

| 342889 | 2 |

| 351676 | 2 |

| 360610 | 2 |

| 363028 | 2 |

| 369304 | 2 |

| 394899 | 2 |

| 397949 | 2 |

| 434982 | 2 |

| 442950 | 2 |

| 454854 | 2 |

| 464362 | 2 |

| 492904 | 2 |

| 498067 | 2 |

| 512461 | 2 |

| 555576 | 2 |

| 568764 | 2 |

| 608483 | 2 |

| 627694 | 2 |

| 633917 | 2 |

| 640867 | 2 |

| 647640 | 2 |

| 656919 | 2 |

| 681576 | 2 |

| 684170 | 2 |

| 721692 | 2 |

| 731213 | 2 |

| 750586 | 2 |

| 756916 | 2 |

| 757216 | 2 |

| 770348 | 2 |

| 794486 | 2 |

| 809235 | 2 |

| 832368 | 2 |

| 861689 | 2 |

| 862525 | 2 |

| 865307 | 2 |

| 873824 | 2 |

| 874299 | 2 |

| 882939 | 2 |

| 883545 | 2 |

| 912442 | 2 |

| 918605 | 2 |

| 921884 | 2 |

| 924197 | 2 |

| 959182 | 2 |

| 960168 | 2 |

| 978433 | 2 |

+----------+--------------+

168 rows in set (0.07 sec)

**Query 3**

List accounts with **more than 5 failed login attempts in the last 24 hours**, including the **account ID**, **number of failed attempts**, and the **most recent timestamp** of those failures.

mysql> SELECT

-> cad.account\_id,

-> COUNT(\*) AS failed\_attempts,

-> MAX(lid.timestamp) AS last\_failed\_attempt

-> FROM

-> login\_instance\_data lid

-> JOIN

-> customer\_account\_data cad ON lid.party\_id = cad.party\_id

-> WHERE

-> lid.successful = FALSE

-> AND lid.timestamp >= NOW() - INTERVAL 1 DAY

-> GROUP BY

-> cad.account\_id

-> HAVING

-> failed\_attempts > 5

-> ORDER BY

-> failed\_attempts DESC;

Empty set (0.02 sec)

In the past 24 hours, **no account had more than 5 failed login attempts.**

**Query 4**

Find Customers Who Accessed Multiple Accounts in the Same Day.

mysql> SELECT

-> li.party\_id,

-> DATE(li.timestamp) AS access\_date,

-> COUNT(DISTINCT ca.account\_id) AS distinct\_accounts\_accessed

-> FROM

-> login\_instance\_data li

-> JOIN

-> customer\_account\_data ca ON li.party\_id = ca.party\_id

-> WHERE

-> li.timestamp IS NOT NULL

-> GROUP BY

-> li.party\_id, DATE(li.timestamp)

-> HAVING

-> COUNT(DISTINCT ca.account\_id) > 1;

+----------+-------------+----------------------------+

| party\_id | access\_date | distinct\_accounts\_accessed |

+----------+-------------+----------------------------+

| 118675 | 2025-07-26 | 2 |

| 120373 | 2025-07-26 | 3 |

| 124876 | 2025-07-26 | 5 |

| 127697 | 2025-07-26 | 2 |

| 136888 | 2025-07-26 | 3 |

| 137895 | 2025-07-26 | 2 |

| 140937 | 2025-07-26 | 2 |

| 142347 | 2025-07-26 | 3 |

| 142537 | 2025-07-26 | 5 |

| 145270 | 2025-07-26 | 5 |

| 152017 | 2025-07-26 | 3 |

| 156059 | 2025-07-26 | 2 |

| 166701 | 2025-07-26 | 2 |

| 173743 | 2025-07-26 | 3 |

| 176588 | 2025-07-26 | 4 |

| 178476 | 2025-07-26 | 5 |

| 183720 | 2025-07-26 | 3 |

| 191947 | 2025-07-26 | 2 |

| 192141 | 2025-07-26 | 3 |

| 192453 | 2025-07-26 | 2 |

| 204417 | 2025-07-26 | 6 |

| 206328 | 2025-07-26 | 2 |

| 210200 | 2025-07-26 | 2 |

| 222328 | 2025-07-26 | 3 |

| 225009 | 2025-07-26 | 3 |

| 263426 | 2025-07-26 | 3 |

| 265756 | 2025-07-26 | 3 |

| 267355 | 2025-07-26 | 4 |

| 273148 | 2025-07-26 | 3 |

| 278362 | 2025-07-26 | 5 |

| 278745 | 2025-07-26 | 2 |

| 279414 | 2025-07-26 | 3 |

| 284063 | 2025-07-26 | 3 |

| 285598 | 2025-07-26 | 4 |

| 289061 | 2025-07-26 | 2 |

| 298585 | 2025-07-26 | 2 |

| 307937 | 2025-07-26 | 4 |

| 328815 | 2025-07-26 | 3 |

| 339643 | 2025-07-26 | 5 |

| 342889 | 2025-07-26 | 2 |

| 351676 | 2025-07-26 | 2 |

| 353168 | 2025-07-26 | 5 |

| 354993 | 2025-07-26 | 7 |

| 363028 | 2025-07-26 | 2 |

| 381705 | 2025-07-26 | 3 |

| 385804 | 2025-07-26 | 3 |

| 394899 | 2025-07-26 | 2 |

| 397949 | 2025-07-26 | 2 |

| 405144 | 2025-07-26 | 5 |

| 426751 | 2025-07-26 | 3 |

| 435649 | 2025-07-26 | 6 |

| 437427 | 2025-07-26 | 3 |

| 455782 | 2025-07-26 | 3 |

| 464362 | 2025-07-26 | 2 |

| 467418 | 2025-07-26 | 3 |

| 482841 | 2025-07-26 | 4 |

| 489089 | 2025-07-26 | 5 |

| 492904 | 2025-07-26 | 2 |

| 496323 | 2025-07-26 | 4 |

| 498067 | 2025-07-26 | 2 |

| 510757 | 2025-07-26 | 3 |

| 510987 | 2025-07-26 | 5 |

| 517213 | 2025-07-26 | 7 |

| 524726 | 2025-07-26 | 4 |

| 553606 | 2025-07-26 | 6 |

| 555576 | 2025-07-26 | 2 |

| 568764 | 2025-07-26 | 2 |

| 608483 | 2025-07-26 | 2 |

| 627694 | 2025-07-26 | 2 |

| 630171 | 2025-07-26 | 6 |

| 638387 | 2025-07-26 | 3 |

| 640867 | 2025-07-26 | 2 |

| 647640 | 2025-07-26 | 2 |

| 654523 | 2025-07-26 | 3 |

| 656919 | 2025-07-26 | 2 |

| 681576 | 2025-07-26 | 2 |

| 684170 | 2025-07-26 | 2 |

| 690831 | 2025-07-26 | 4 |

| 693875 | 2025-07-26 | 3 |

| 695822 | 2025-07-26 | 3 |

| 702347 | 2025-07-26 | 4 |

| 703047 | 2025-07-26 | 4 |

| 721692 | 2025-07-26 | 2 |

| 730556 | 2025-07-26 | 3 |

| 731213 | 2025-07-26 | 2 |

| 750586 | 2025-07-26 | 2 |

| 753483 | 2025-07-26 | 3 |

| 756916 | 2025-07-26 | 2 |

| 757216 | 2025-07-26 | 2 |

| 764417 | 2025-07-26 | 3 |

| 766398 | 2025-07-26 | 4 |

| 768390 | 2025-07-26 | 5 |

| 770348 | 2025-07-26 | 2 |

| 784246 | 2025-07-26 | 6 |

| 794486 | 2025-07-26 | 2 |

| 796365 | 2025-07-26 | 3 |

| 802344 | 2025-07-26 | 3 |

| 806515 | 2025-07-26 | 3 |

| 823236 | 2025-07-26 | 4 |

| 832368 | 2025-07-26 | 2 |

| 846102 | 2025-07-26 | 6 |

| 848469 | 2025-07-26 | 4 |

| 860481 | 2025-07-26 | 3 |

| 861689 | 2025-07-26 | 2 |

| 862525 | 2025-07-26 | 2 |

| 865307 | 2025-07-26 | 2 |

| 873824 | 2025-07-26 | 2 |

| 882208 | 2025-07-26 | 3 |

| 882939 | 2025-07-26 | 2 |

| 891092 | 2025-07-26 | 4 |

| 899690 | 2025-07-26 | 7 |

| 912442 | 2025-07-26 | 2 |

| 912674 | 2025-07-26 | 5 |

| 918605 | 2025-07-26 | 2 |

| 918807 | 2025-07-26 | 8 |

| 921884 | 2025-07-26 | 2 |

| 924197 | 2025-07-26 | 2 |

| 927372 | 2025-07-26 | 3 |

| 932942 | 2025-07-26 | 4 |

| 957476 | 2025-07-26 | 4 |

| 957570 | 2025-07-26 | 4 |

| 959182 | 2025-07-26 | 2 |

| 968810 | 2025-07-26 | 3 |

+----------+-------------+----------------------------+

123 rows in set (0.01 sec)

**Query 5**

Identify all devices used to access more than 3 distinct accounts in the last 7 days.

mysql> SELECT

-> lid.device\_id,

-> COUNT(DISTINCT cad.account\_id) AS distinct\_accounts\_accessed

-> FROM

-> login\_instance\_data lid

-> JOIN

-> customer\_account\_data cad ON lid.party\_id = cad.party\_id

-> WHERE

-> lid.timestamp >= NOW() - INTERVAL 7 DAY

-> GROUP BY

-> lid.device\_id

-> HAVING

-> COUNT(DISTINCT cad.account\_id) > 3

-> ORDER BY

-> distinct\_accounts\_accessed DESC;

+-----------+----------------------------+

| device\_id | distinct\_accounts\_accessed |

+-----------+----------------------------+

| 807 | 15 |

| 580 | 12 |

| 77 | 10 |

| 694 | 10 |

| 127 | 9 |

| 617 | 9 |

| 552 | 8 |

| 716 | 8 |

| 183 | 8 |

| 317 | 7 |

| 41 | 7 |

| 979 | 7 |

| 855 | 7 |

| 672 | 7 |

| 684 | 7 |

| 682 | 7 |

| 486 | 6 |

| 679 | 6 |

| 686 | 6 |

| 657 | 6 |

| 654 | 6 |

| 641 | 6 |

| 624 | 6 |

| 622 | 6 |

| 824 | 6 |

| 90 | 6 |

| 48 | 6 |

| 549 | 6 |

| 25 | 5 |

| 713 | 5 |

| 985 | 5 |

| 946 | 5 |

| 924 | 5 |

| 577 | 5 |

| 415 | 5 |

| 907 | 5 |

| 905 | 5 |

| 404 | 5 |

| 387 | 5 |

| 116 | 5 |

| 837 | 5 |

| 808 | 5 |

| 134 | 5 |

| 786 | 5 |

| 300 | 5 |

| 239 | 5 |

| 780 | 5 |

| 167 | 5 |

| 687 | 5 |

| 719 | 5 |

| 996 | 5 |

| 700 | 4 |

| 697 | 4 |

| 142 | 4 |

| 163 | 4 |

| 726 | 4 |

| 730 | 4 |

| 735 | 4 |

| 753 | 4 |

| 775 | 4 |

| 220 | 4 |

| 336 | 4 |

| 789 | 4 |

| 806 | 4 |

| 371 | 4 |

| 373 | 4 |

| 128 | 4 |

| 378 | 4 |

| 631 | 4 |

| 407 | 4 |

| 591 | 4 |

| 464 | 4 |

| 481 | 4 |

| 54 | 4 |

| 524 | 4 |

| 519 | 4 |

+-----------+----------------------------+

76 rows in set (0.01 sec)

**Query 6**

Identify customers who accessed accounts from multiple locations within a short time frame (possible location fraud).

mysql> SELECT

-> lid.party\_id,

-> COUNT(DISTINCT lid.location\_id) AS location\_count,

-> MIN(lid.timestamp) AS first\_access,

-> MAX(lid.timestamp) AS last\_access

-> FROM

-> login\_instance\_data lid

-> WHERE

-> lid.timestamp >= NOW() - INTERVAL 1 DAY

-> GROUP BY

-> lid.party\_id

-> HAVING

-> location\_count > 1

-> AND TIMESTAMPDIFF(MINUTE, first\_access, last\_access) <= 60

-> ORDER BY

-> location\_count DESC;

Empty set (0.01 sec)

**Query 7**

Which users (party\_ids) have used suspicious or blacklisted devices?

mysql> SELECT DISTINCT ca.party\_id

-> FROM fraud\_alert\_data fa

-> JOIN transaction\_data td ON fa.transaction\_id = td.transaction\_id

-> JOIN customer\_account\_data ca

-> ON td.payer\_party\_id = ca.party\_id OR td.payee\_party\_id = ca.party\_id

-> WHERE fa.status IN ('active', 'open');

+----------+

| party\_id |

+----------+

| 204417 |

| 846102 |

| 768390 |

| 753483 |

| 124876 |

| 576134 |

| 957570 |

| 860481 |

| 912674 |

| 222328 |

| 630171 |

| 791592 |

| 107171 |

| 342889 |

| 550379 |

| 206328 |

| 707848 |

| 481010 |

| 957476 |

| 285598 |

| 681576 |

| 918904 |

| 844547 |

| 796365 |

| 426751 |

| 178476 |

| 405344 |

| 978433 |

| 647640 |

| 932942 |

| 781546 |

| 627699 |

| 703047 |

| 883545 |

| 633917 |

| 278450 |

| 118675 |

| 553606 |

| 702347 |

| 666258 |

| 339643 |

| 627694 |

| 498067 |

| 778853 |

| 394867 |

| 199234 |

| 278362 |

| 512461 |

| 464362 |

| 742541 |

| 490754 |

| 960168 |

| 912442 |

| 183571 |

| 882939 |

| 805775 |

| 136888 |

| 215560 |

| 101688 |

| 771452 |

| 239917 |

| 294470 |

| 631998 |

| 640867 |

| 724144 |

| 173743 |

| 183720 |

+----------+

67 rows in set (0.02 sec)

**Query 8**

**Identify customers with multiple fraud alerts and aggregate their associated account IDs.**

mysql> SELECT

-> ca.party\_id,

-> GROUP\_CONCAT(DISTINCT ca.account\_id ORDER BY ca.account\_id) AS associated\_accounts,

-> COUNT(\*) AS fraud\_alert\_count

-> FROM

-> fraud\_alert\_data fa

-> JOIN

-> transaction\_data td ON fa.transaction\_id = td.transaction\_id

-> JOIN

-> customer\_account\_data ca

-> ON td.payer\_party\_id = ca.party\_id OR td.payee\_party\_id = ca.party\_id

-> WHERE

-> fa.status IN ('active', 'open')

-> GROUP BY

-> ca.party\_id

-> HAVING

-> fraud\_alert\_count > 1

-> ORDER BY

-> fraud\_alert\_count DESC;

+----------+-------------------------------------------+-------------------+

| party\_id | associated\_accounts | fraud\_alert\_count |

+----------+-------------------------------------------+-------------------+

| 339643 | 434192,439587,454042,803384,810076 | 15 |

| 912674 | 134418,301980,753542,775478,921702 | 15 |

| 204417 | 103455,209225,335617,676116,909219,917900 | 12 |

| 627699 | 319899,449855,486387,917900 | 12 |

| 553606 | 398815,496818,651296,814552,865749,983401 | 12 |

| 285598 | 193419,486843,577551,773130 | 12 |

| 124876 | 128177,402742,524893,589765,661642 | 10 |

| 178476 | 255450,418610,528434,765660,778104 | 10 |

| 278362 | 577551,630489,787629,839037,968187 | 10 |

| 702347 | 403768,539729,552808,875852 | 8 |

| 918904 | 194011,357794,441655,912935 | 8 |

| 342889 | 157413,331539 | 8 |

| 957570 | 130360,469941,937987,963228 | 8 |

| 550379 | 157413,199497,772671,844987 | 8 |

| 183720 | 839537,909219,968735 | 6 |

| 222328 | 135419,319899,417859 | 6 |

| 912442 | 595082,703768 | 6 |

| 753483 | 105664,379271,742983 | 6 |

| 630171 | 143337,150070,158937,346693,694316,803830 | 6 |

| 860481 | 133789,169303,499692 | 6 |

| 846102 | 103455,572143,810076,819692,878346,910494 | 6 |

| 768390 | 105623,563030,691281,776734,935975 | 5 |

| 703047 | 339006,578475,703768,983401 | 4 |

| 957476 | 186317,576199,756083,992438 | 4 |

| 576134 | 129912,209961,402742,676116 | 4 |

| 627694 | 466930,808644 | 4 |

| 633917 | 377488,697906 | 4 |

| 932942 | 309660,385695,420743,985821 | 4 |

| 647640 | 284955,310233 | 4 |

| 707848 | 162555,363039,394530,759248 | 4 |

| 796365 | 223894,311103,339006 | 3 |

| 426751 | 242938,552808,844987 | 3 |

| 136888 | 645680,660368,664564 | 3 |

| 173743 | 831883,839537,849255 | 3 |

| 791592 | 143337,558455,881090 | 3 |

| 101688 | 653955 | 2 |

| 681576 | 194011,932674 | 2 |

| 666258 | 417859 | 2 |

| 640867 | 742983,880530 | 2 |

| 631998 | 726865 | 2 |

| 771452 | 695409 | 2 |

| 512461 | 582295,844987 | 2 |

| 498067 | 509465,516758 | 2 |

| 464362 | 585667,800194 | 2 |

| 405344 | 273702 | 2 |

| 882939 | 602658,667944 | 2 |

| 883545 | 355301,589068 | 2 |

| 239917 | 703429,775199 | 2 |

| 206328 | 160932,676116 | 2 |

| 199234 | 576199 | 2 |

| 183571 | 602658,603961 | 2 |

| 118675 | 385695,728729 | 2 |

| 107171 | 156460,753542 | 2 |

| 960168 | 589765,989490 | 2 |

| 978433 | 277505,364235 | 2 |

+----------+-------------------------------------------+-------------------+

55 rows in set (0.07 sec)