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Project: Loan Data Integrity Audit

1.0 Background

Every organisation relies heavily on technology and automation to save time and resources. This enables focus on core businesses that create extra value. Banks deploy desktop and mobile applications, IT infrastructure connected to each other and performed by skilled personnel to serve the needs of customers and the bank itself. Some of the electronic services delivered by the banks include internet banking, banking apps, POS, debit and credit. It is expected that all the services delivered by the bank should be able to serve customers with limited human intervention.

Objective:

The objective of this project is to determine the integrity of the bank loan data to correctly reflect customers' monthly repayment instalment, principal loan balance and loan final repayment date and continuously maintain such values with integrity to be relied on by both the bank and customers at any material point in time.

Scope and Information Classification:

25 loan details of customers were used for this project. The loans were disbursed within the 2nd half of 2025 up to 31st December 2025 with tenor ranging from 2 to 6 years. The total exposed loan amount is $2.62m.

Methodology:

The following methods were deployed:

- Acquired sample datasets relating to 25 bank loan details of customers with the following information: *Customer ID, Customer name, Loan disbursed date, Loan amount disbursed, Annual interest rate, Loan principal balance, Loan final repayment date, Type of security, Monthly loan instalment, Collateral held by bank response.*
- Manually recalculating the loan tenor, loan principal and monthly instalment to determine correctness using the loan amortisation calculator with link below:
  https://shorturl.at/qOtiF
- The recalculated value was compared to the data fetched to determine matches and differences
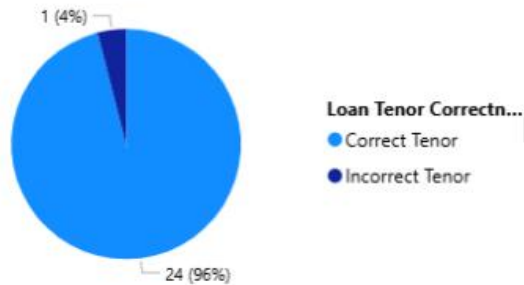
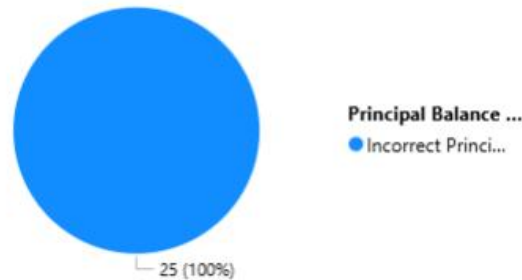| Customer ID	Customer Name	Loan Disbursed Date	Loan Amount Disbursed	Loan Period (Months)	Loan Annual Interest Rate (%)	Loan Principal Balance	Loan Final Repayment Date	Type of Security	Monthly Loan Instalment	Collateral Held By Bank	Loan Tenor Recalculated	Loan Tenor Correctness	Loan Principal Balance	Principal Balance Correctness	Monthly Loan Instalment Recalculated	Monthly Instalment Correctness
1001	Noah Peterson	025-10-11 00:00:00	120000	63	7.2	112913.15	2030-12-14 00:00:00	Vehicle	2624.76	Yes	63	Correct Tenor	116884.50	Incorrect Principal Balance	2293.03	Incorrect Monthly Instalment
1002	Robert Sinclair	025-12-27 00:00:00	120000	27	6.5	119320.74	2028-03-16 00:00:00	Equipment	5094.44	Yes	27	Correct Tenor	120000.00	Incorrect Principal Balance	4789.37	Incorrect Monthly Instalment
1003	Kevin Park	025-10-01 00:00:00	40000	25	8	34337.77	2027-10-21 00:00:00	Equipment	1866.67	Yes	25	Correct Tenor	35543.37	Incorrect Principal Balance	1866.67	Correct Monthly Instalment
1004	Jean Tremblay	025-07-15 00:00:00	120000	29	7.2	92633.66	2027-12-02 00:00:00	Vehicle	4857.93	Yes	29	Correct Tenor	100766.90	Incorrect Principal Balance	4520.74	Incorrect Monthly Instalment
1005	Victor Ivanov	025-10-15 00:00:00	40000	65	8	37736.07	2031-02-16 00:00:00	Commercial Property	882.05	Yes	65	Correct Tenor	39009.37	Incorrect Principal Balance	760.34	Incorrect Monthly Instalment
1006	Priya Patel	025-09-10 00:00:00	85000	27	11	70338.04	2027-11-29 00:00:00	Unsecured	3927.31	No	27	Correct Tenor	76556.21	Incorrect Principal Balance	3568.12	Incorrect Monthly Instalment
1007	Grace O'Neill	025-07-21 00:00:00	120000	52	7.2	103549.55	2029-10-28 00:00:00	Cash Collateral	3027.69	Yes	52	Correct Tenor	110014.68	Incorrect Principal Balance	2693.24	Incorrect Monthly Instalment
1008	Lucas Martin	025-10-11 00:00:00	200000	41	6.5	183904.27	2029-02-22 00:00:00	Unsecured	5961.38	No	41	Correct Tenor	191237.21	Incorrect Principal Balance	5452.89	Incorrect Monthly Instalment
1009	Noah Peterson	025-10-30 00:00:00	120000	49	6.5	113595.44	2029-11-08 00:00:00	Commercial Property	3098.98	Yes	49	Correct Tenor	115698.53	Incorrect Principal Balance	2794.93	Incorrect Monthly Instalment
1010	James Wilson	025-09-13 00:00:00	200000	67	8	184309.78	2031-03-16 00:00:00	Commercial Property	4318.41	Yes	67	Correct Tenor	192819.39	Incorrect Principal Balance	3710.98	Incorrect Monthly Instalment
1011	Olivia Chen	025-09-26 00:00:00	40000	57	8	36901.06	2030-06-02 00:00:00	Equipment	968.42	Yes	57	Correct Tenor	38250.93	Incorrect Principal Balance	845.82	Incorrect Monthly Instalment
1012	Mohammed Hassan	025-10-25 00:00:00	60000	33	8	55046.06	2028-07-11 00:00:00	Commercial Property	2218.18	Yes	33	Correct Tenor	56726.05	Incorrect Principal Balance	2031.54	Incorrect Monthly Instalment
1013	Daniel Okafor	025-10-08 00:00:00	200000	59	8	186775.15	2030-08-13 00:00:00	Cash Collateral	4723.16	Yes	59	Correct Tenor	194425.68	Incorrect Principal Balance	4111.23	Incorrect Monthly Instalment
1014	Robert Sinclair	025-10-12 00:00:00	200000	37	9.5	181363.36	2028-10-26 00:00:00	Residential Property	6988.74	Yes	37	Correct Tenor	190615.90	Incorrect Principal Balance	6256.88	Incorrect Monthly Instalment
1015	Mohammed Hassan	025-11-29 00:00:00	25000	54	7.2	24346.18	2030-05-07 00:00:00	Cash Collateral	612.96	Yes	54	Correct Tenor	24606.62	Incorrect Principal Balance	543.38	Incorrect Monthly Instalment
1016	Robert Sinclair	025-11-08 00:00:00	40000	71	8	38533.58	2031-09-08 00:00:00	Vehicle	830.05	Yes	71	Correct Tenor	39557.63	Incorrect Principal Balance	709.03	Incorrect Monthly Instalment
1017	Fatima Ali	025-11-27 00:00:00	25000	38	8	24065.5	2029-01-10 00:00:00	Cash Collateral	824.56	Yes	38	Correct Tenor	24419.74	Incorrect Principal Balance	746.92	Incorrect Monthly Instalment
1018	Sophie Dubois	025-08-22 00:00:00	120000	31	8	139444.8	2028-03-09 00:00:00	Vehicle	4670.97	Yes	31	Correct Tenor	105869.16	Incorrect Principal Balance	4297.58	Incorrect Monthly Instalment
1019	Robert Sinclair	025-07-02 00:00:00	85000	37	7.2	67969.05	2028-07-16 00:00:00	Unsecured	2807.3	No	37	Correct Tenor	74582.83	Incorrect Principal Balance	2568.58	Incorrect Monthly Instalment
1020	Lucas Martin	025-09-26 00:00:00	60000	46	11	75692.51	2029-07-07 00:00:00	Vehicle	1854.35	Yes	46	Correct Tenor	56807.42	Incorrect Principal Balance	1604.50	Incorrect Monthly Instalment
1021	Sarah Nguyen	025-12-05 00:00:00	40000	63	11	39131.96	2031-08-06 00:00:00	Unsecured	1001.59	No	69	Incorrect Tenor	40000.00	Incorrect Principal Balance	838.63	Incorrect Monthly Instalment
1022	Grace O'Neill	025-08-07 00:00:00	200000	44	9.5	170173.22	2029-03-19 00:00:00	Unsecured	6128.79	No	44	Correct Tenor	184547.93	Incorrect Principal Balance	5400.78	Incorrect Monthly Instalment
1023	Emily Brown	025-11-07 00:00:00	200000	39	7.2	188609.22	2029-01-20 00:00:00	Unsecured	6328.21	No	39	Correct Tenor	195433.12	Incorrect Principal Balance	5766.88	Incorrect Monthly Instalment
1024	Aisha Mohammed	025-07-21 00:00:00	40000	68	9.5	35083.38	2031-02-20 00:00:00	Unsecured	904.9	No	68	Correct Tenor	37732.84	Incorrect Principal Balance	762.98	Incorrect Monthly Instalment
1025	Jean Tremblay	025-12-08 00:00:00	120000	41	11	116912.76	2029-04-21 00:00:00	Cash Collateral	4026.83	Yes	41	Correct Tenor	120000.00	Incorrect Principal Balance	3524.44	Incorrect Monthly Instalment

2.0 Audit Outcomes

Deficiencies were found with the accurateness of loan details with regards to all the three (3) key objectives for this project. The outcomes are as:

- 24 out of the 25 loan tenors were incorrectly calculated
- All 25 loan principal balances were incorrect as expected for 31st December 2025 balances
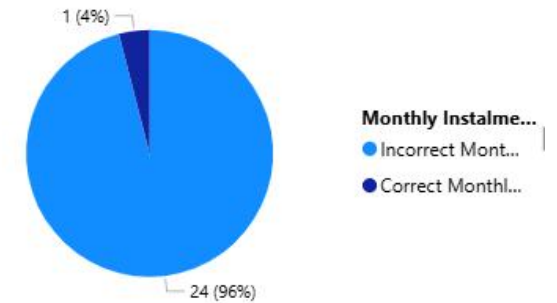- 24 out of the 25 monthly instalment were incorrectly calculated.

Loan Tenor Amount at Risk: $40k	**Principal Balance** Amount at Risk: $2.62m	**Monthly Instalment** Amount at Risk: $2.58m

Loan Tenor Correctn...
- Correct Tenor
- Incorrect Tenor

1 (4%)
24 (96%)

Principal Balance ...
- Incorrect Princi...

25 (100%)

Monthly Instalme...
- Incorrect Mont...
- Correct Monthl...

1 (4%)
24 (96%)

Root Causes:

- Inadequate system design. The system may not fully support bank's products or documented requirements. Possible poor customization may have been implemented.
- Incorrect loan configuration parameters which may result from calculation method. Incorrectly set month or year for tenor was misconfigured.
- Poorly tested systems. After configurations, the interest calculation logic and repayment schedules were not adequately tested.
- Weak data validation during the input stages. Data inputs may not have been validated such as accepting invalid dates and tenors.
- Manual overrides. Officer may have forced entries beyond the standard processing logic.

Exposed Risks

The three findings will generally result in the following risks to the bank:

- Financial misstatement risk. The incorrect principal balance completely puts all the disbursed loan of $2.62m at risk.
- Customer experience and reputation risk. Customers may challenge the loan statement due to overcharge and loose trust in the bank
- Regulatory and compliance risk. Trigger regulatory findings for breach with consumer protection laws which may result in fine and possible closure.
- Control breakdown and inefficiencies. The need to correct errors will result in increased human intervention and workload which may result in more errors and impacts.
- Decision making risk. The risk of mispricing products, misjudging portfolio risk and make further poor credit decisions.

The weak integrity of the bank loan data poses integrity issues for both parties. The risk exposure should be assessed immediately with appropriate primary or supplementary controls put in place. The following controls have been recommended guided by NIST SP 800-53r5: Security and Privacy Controls for Information Systems and Organizations

Finding	Recommended Controls based on NIST SP 800-53r5
Loan tenor incorrectness	AT-1: Policy and Procedures
	AT-3: Role-based Training
Principal balance incorrectness	CM-2: Baseline Configuration
	MA-2: Controlled Maintenance
Monthly instalment amount incorrectness	MA-4: Maintenance Personnel
	MA-6: Timely Maintenance
	SA-4: Acquisition Process
	SA-10 Developer Configuration Management
	SA-11: Developer Testing and Evaluation
	SI-12: Error Handling