

Title: Analysis of Credit Card Data

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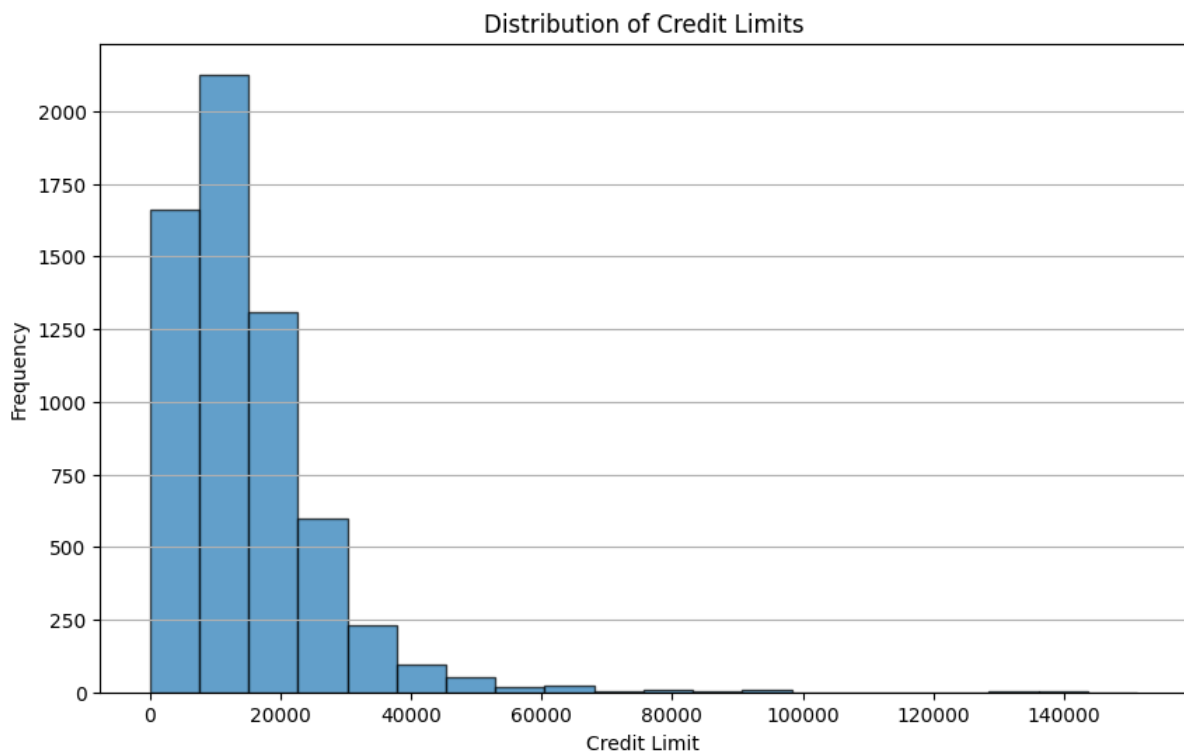
Student ID: 23072740

Dataset Link: <https://www.kaggle.com/datasets/computingvictor/transactions-fraud-datasets>

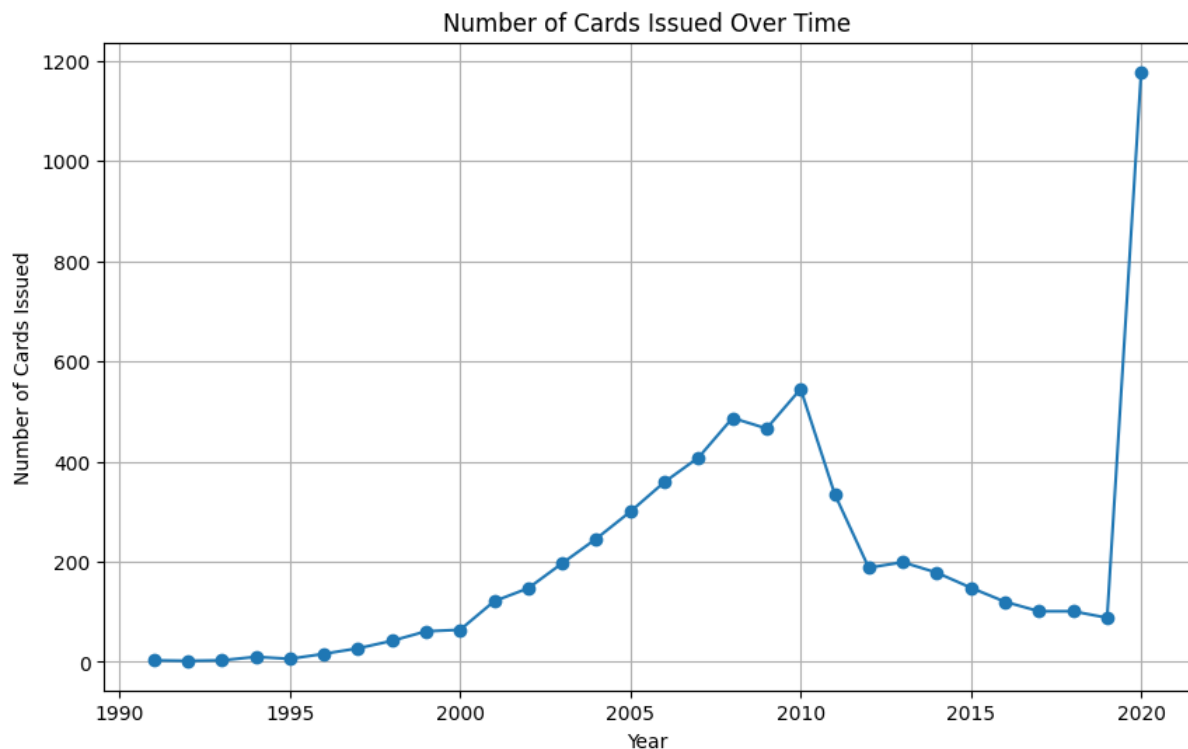
GitHub Link: <https://github.com/Samyuktha-DS/Final-Visualisation-Report.git>

Overview of the Data

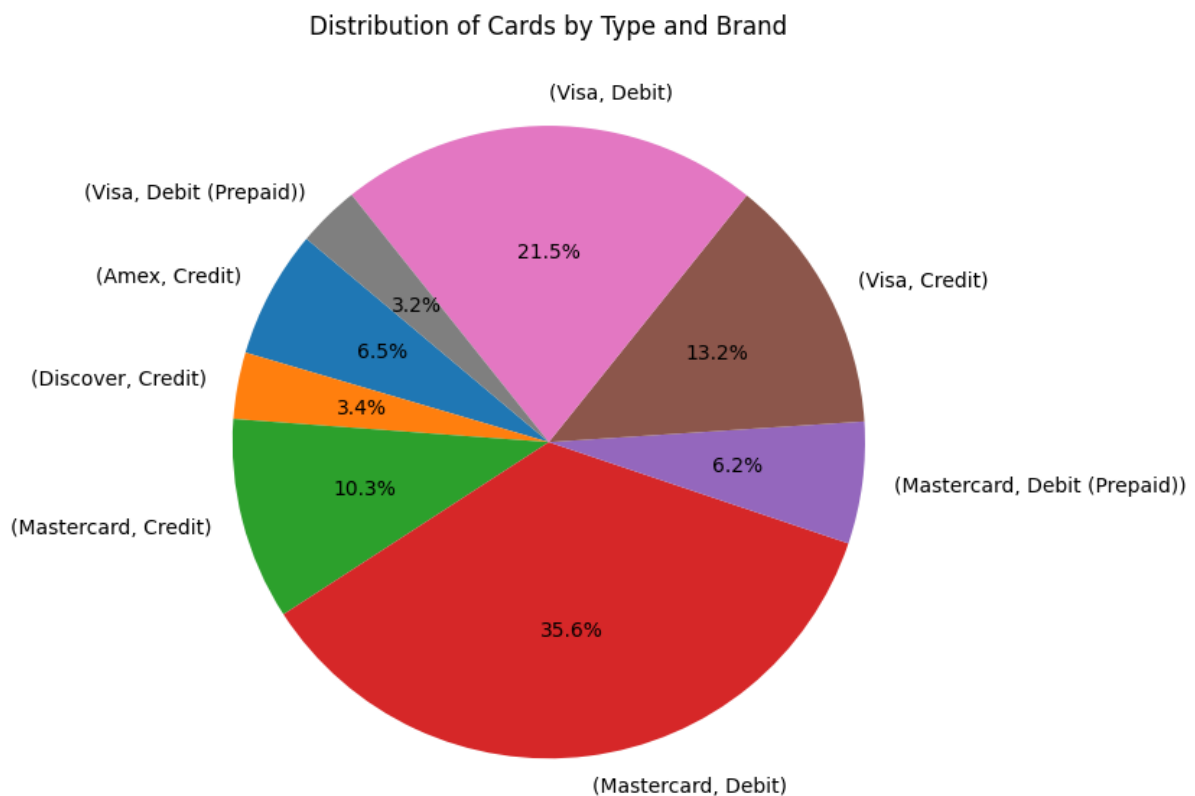
The dataset comprises information on credit card details across various brands and types. Key attributes include card brand, card type, credit limits, issuance details, and security practices, such as the year the PIN was last changed. The data spans different card brands (e.g., Visa, Mastercard, Amex) and types (e.g., Credit, Debit). Statistical analyses and visualizations were conducted to uncover patterns and insights.



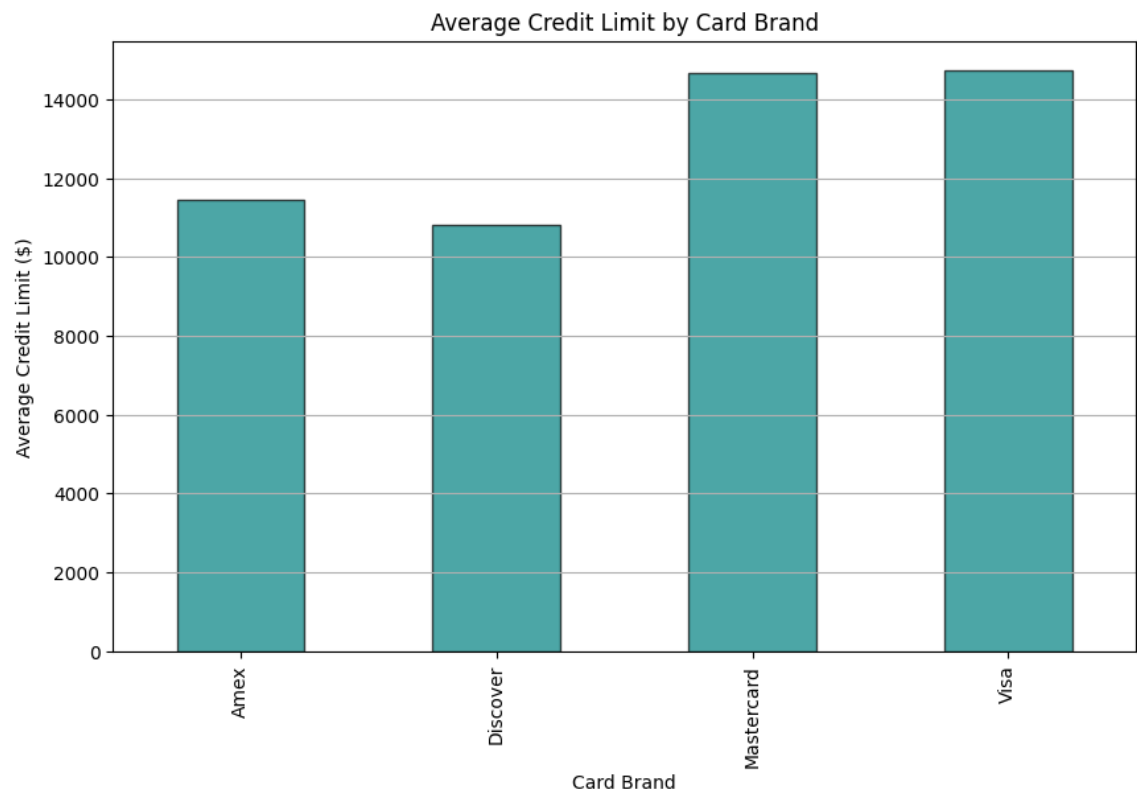
The histogram shows a right-skewed distribution, with most credit limits concentrated below \$20,000. A smaller segment of the population has very high credit limits exceeding \$100,000, potentially representing premium or corporate cards. The declining frequency as the limit increases suggests a conservative approach to issuing high-limit cards.



The line plot shows a noticeable upward trend in card issuance was observed from the 1990s until 2010, coinciding with economic expansion and the rise of digital transactions. The sharp decline post-2010 could indicate market saturation, stricter issuance criteria, or a shift toward alternative payment methods like mobile wallets. The sharp peak at 2020 could signal a response to increased card adoption due to the COVID-19 pandemic and the resulting surge in contactless payments.



Mastercard Debit cards hold the largest share of the market at 35.6%, reflecting their widespread acceptance and utility for day-to-day transactions. Visa Debit follows closely at 21.5%, highlighting its popularity in a similar space. Prepaid debit cards represent the smallest proportion, likely due to their niche appeal for specific use cases such as gift cards or temporary accounts. Credit cards from Discover and Amex have a relatively small share, suggesting these brands focus on specific, high-value customers.



Visa and Mastercard exhibit the highest average credit limits, approximately \$14,700, indicative of their broad appeal across both high- and low-credit segments. Amex and Discover cards, while having lower average credit limits (~\$11,000), likely cater to a specific clientele with unique spending habits. The relatively narrow range of average credit limits across brands indicates a similar overall market strategy, with subtle differences in customer targeting.

Card brand	Card type	Credit limit	Credit limit	Num cards issued	Year pin last changed
		mean	median	sum	median
Amex	Credit	11436.31841	10250	608	2013
Discover	Credit	10816.26794	9800	311	2012
Mastercard	Credit	10971.65354	10200	953	2012
Mastercard	Debit	18279.71109	16218	3299	2013
Mastercard	Debit (Prepaid)	64.77806789	65	568	2012
Visa	Credit	11295.56104	9900	1237	2012
Visa	Debit	19019.62121	16773.5	1957	2012
Visa	Debit (Prepaid)	63.8	64	305	2013

Table 1 - Credit Limit Statistics by Brand and Type

Mastercard Debit cards exhibit the highest average credit limit (\$18,280), which aligns with their dominance in the pie chart analysis. This indicates their utility for day-to-day and business transactions. Amex Credit cards have a relatively low median credit limit (\$10,250), showing they more cautious or niche customers with moderate spending needs. The median year of PIN last changed (~2012-2013 across all card types) suggests consistent but outdated security practices. This highlights a potential area for improvement across all brands and types.

Card Brand	Mean Credit Limit (\$)	Median Credit Limit (\$)	Std Dev (\$)	Min Credit Limit (\$)	Max Credit Limit (\$)
Amex	11436.32	10250	7198.848	0	89900
Discover	10816.27	9800	5703.687	0	44200
Mastercard	14659.6	13013	12590.76	0	151223
Visa	14737.33	12791.5	12167.86	0	132439

Table 2 - Detailed Credit Limit Statistics by Card Brand

Mastercard and Visa show higher standard deviations in credit limits (\$12,591 and \$12,168), reflecting a diverse clientele, from low- to high-credit users. With the highest maximum credit limits (\$132,439 for Visa and \$151,223 for Mastercard), these brands cater to premium and corporate users, highlighting their broad market reach. In contrast, Discover and Amex target specific demographics, focusing on premium users and exclusive perks.

The analysis reveals distinct strategies and patterns across card brands and types. Visa and Mastercard prioritize high-credit clients and maintain a significant share in the Debit card segment, while Amex and Discover cater to a niche market. The observed trends and insights can guide future policies and business strategies, such as enhancing security protocols and targeting underserved demographics.