LendingClub

By Struan Logan

What will we be looking at?

- Who are LendingClub?
- What is the dataset?
- What are my findings?

Who are LendingClub?

- An American financial services company which was the first to offer peer to peer loans.

- People list about themselves as the borrower, amount of loan, loan grade, and loan purpose.

- Investors then pick which loans to back then make money off the interest.

Our Purpose and Data

- We are here to investigate the default rate.
- Finding out who should be avoided and who should be encouraged.
- We were given a massive dataset of 40,000 loans from 2007 to 2011.
- Data Ethics?

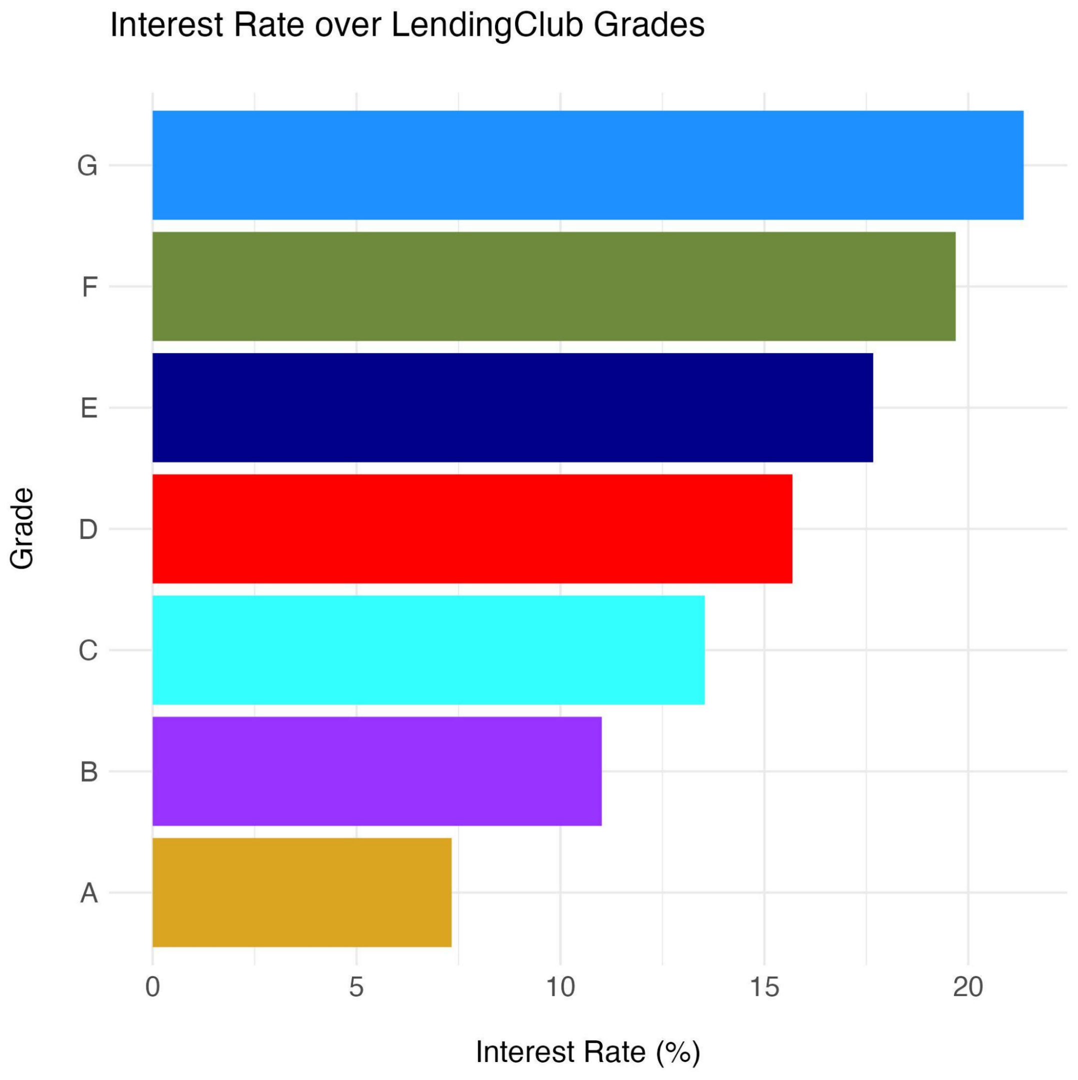
Initial Findings

- Loans varied from $500 to $35,000.

- The average loan being $11,134.

- Interest rates varying from just over 5% to just under 25%.

- The ratio of success the default rate is 14.5% to 85.5% fully paid loans.



Interest Rate over LendingClub Grades
Grade
G
F
E
D
C
B
A
0
5
10
15
20
Interest Rate (%)

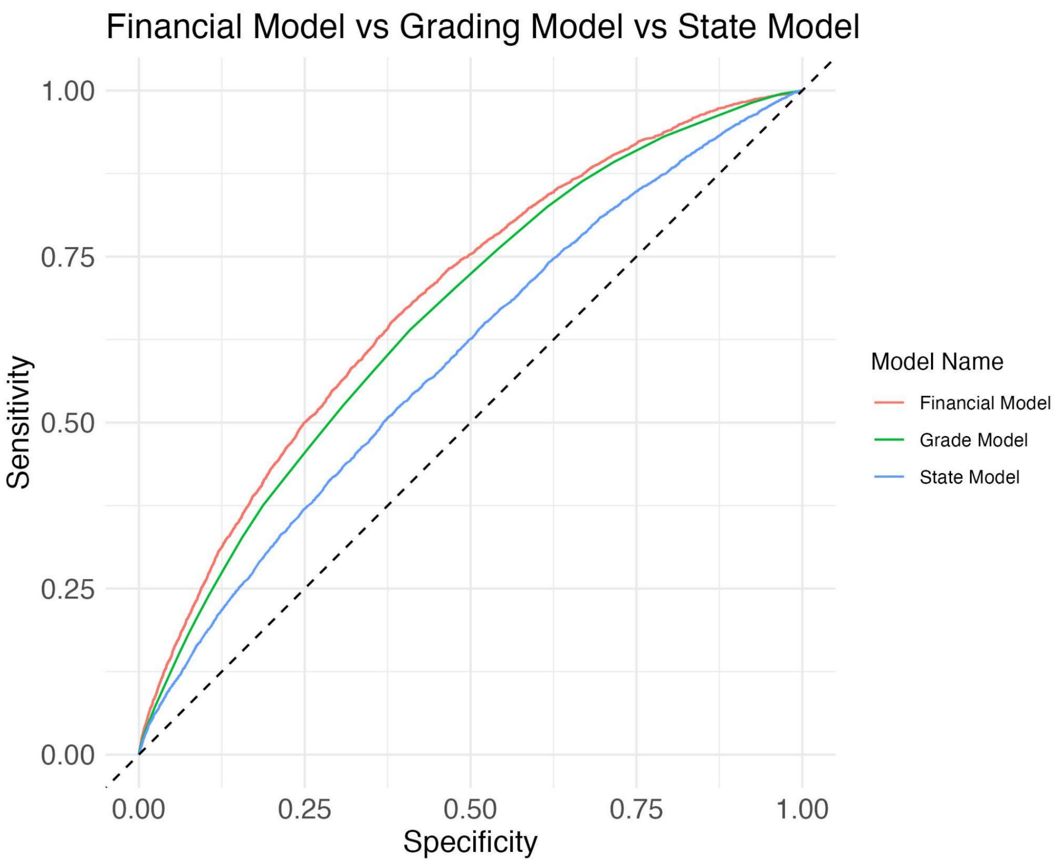
We made our own models using:

Finance Model

1) Annual income
2) FICO Credit Score
3) DTI: The debt obligation divided by the lender's income
4) The term of the loan (3 years or 5 years).

State Model

1) US State
2) Purpose of Loan
3) Length of Employment
4) Home Ownership Status



Financial Model AUC
Score = 0.685

Grade Model AUC
Score = 0.662

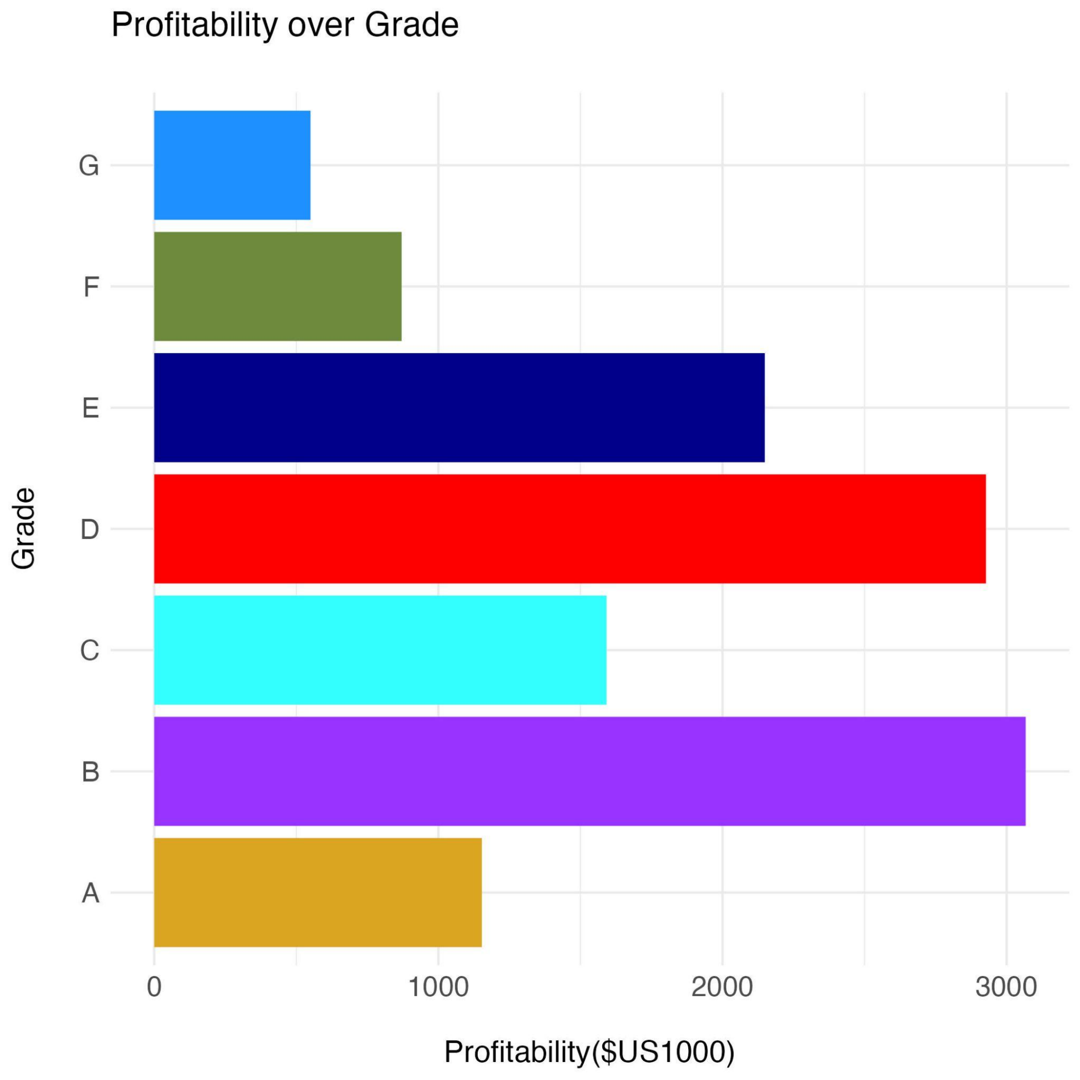
State Model AUC
Score = 0.595

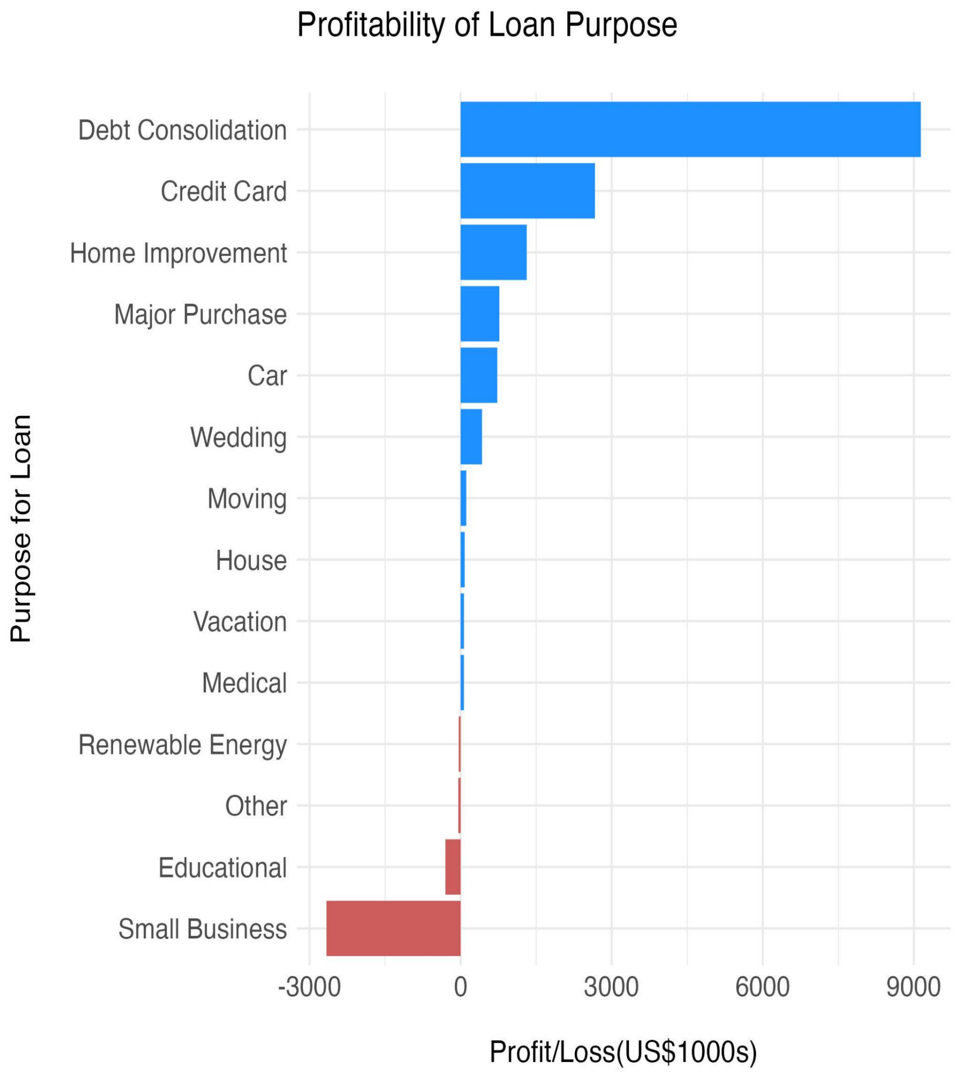
After K-Fold Cross
Validation

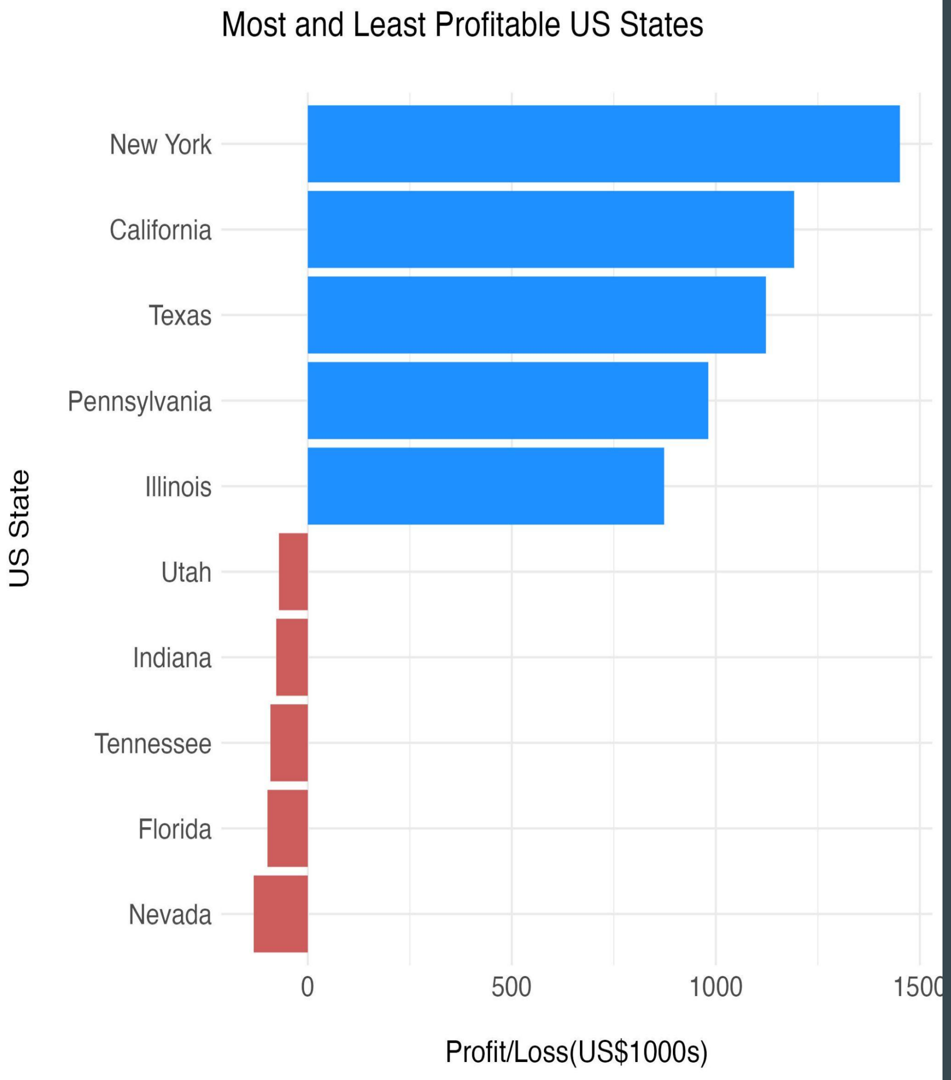
Financial Model
AUC Score = 0.683

Grade Model AUC
Score = 0.659

State Model AUC
Score = 0.580


Profitability over Grade
Grade
G
F
E
D
C
B
A
0
1000
2000
3000
Profitability($US1000)


Profitability of Loan Purpose
Purpose for Loan
Debt Consolidation
Credit Card
Home Improvement
Major Purchase
Car
Wedding
Moving
House
Vacation
Medical
Renewable Energy
Other
Educational
Small Business
-3000
0
3000
6000
9000
Profit/Loss(US$1000s)


Most and Least Profitable US States
US State
New York
California
Texas
Pennsylvania
Illinois
Utah
Indiana
Tennessee
Florida
Nevada
0
500
1000
1500
Profit/Loss(US$1000s)

Nevada vs New York Differences?

- The default rate in Nevada is 22% whereas in New York it is only 13%.

- When it comes to mean annual income in Nevada it is $68,235 and in New York it is $71,485.

- When it comes to debt to income ratio in Nevada it is 13.57 and in New York it is 12.24.

- Lastly when it comes to interest rates in Nevada it is 12.47% and in New York it is 12.04%

Conclusion

- The Grading System already produces a good Logistical Regression Model but using the lenders finances can boost that accuracy.

- Going for people with strong income will generate reliable returns but those with lower grades will generate a higher profit for the investor.

- We can find certain variables like purpose of loan and state are significant to default rate.

- Consider putting a higher interest rate on certain states and purposes to combat their higher default rate.

Extra Content!

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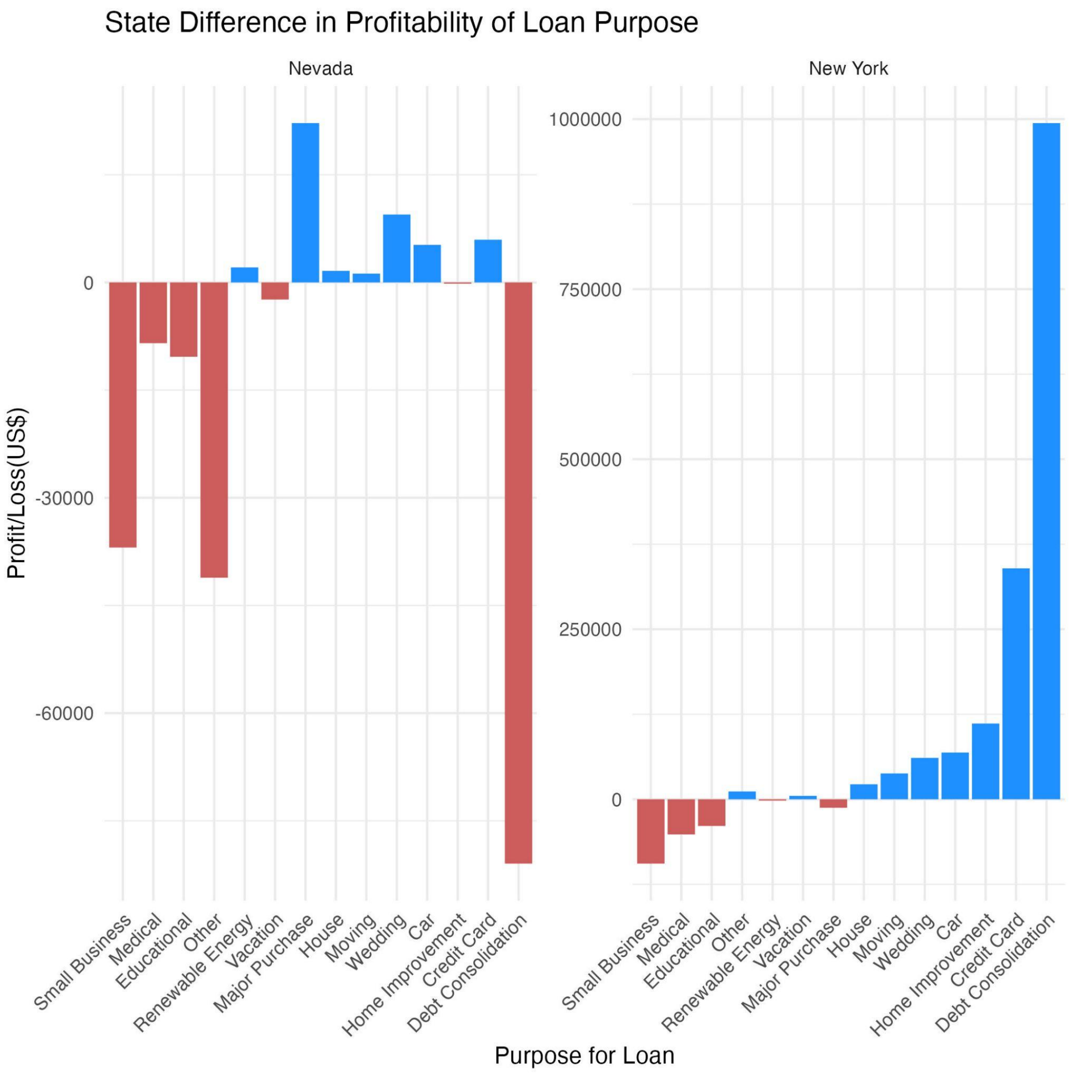
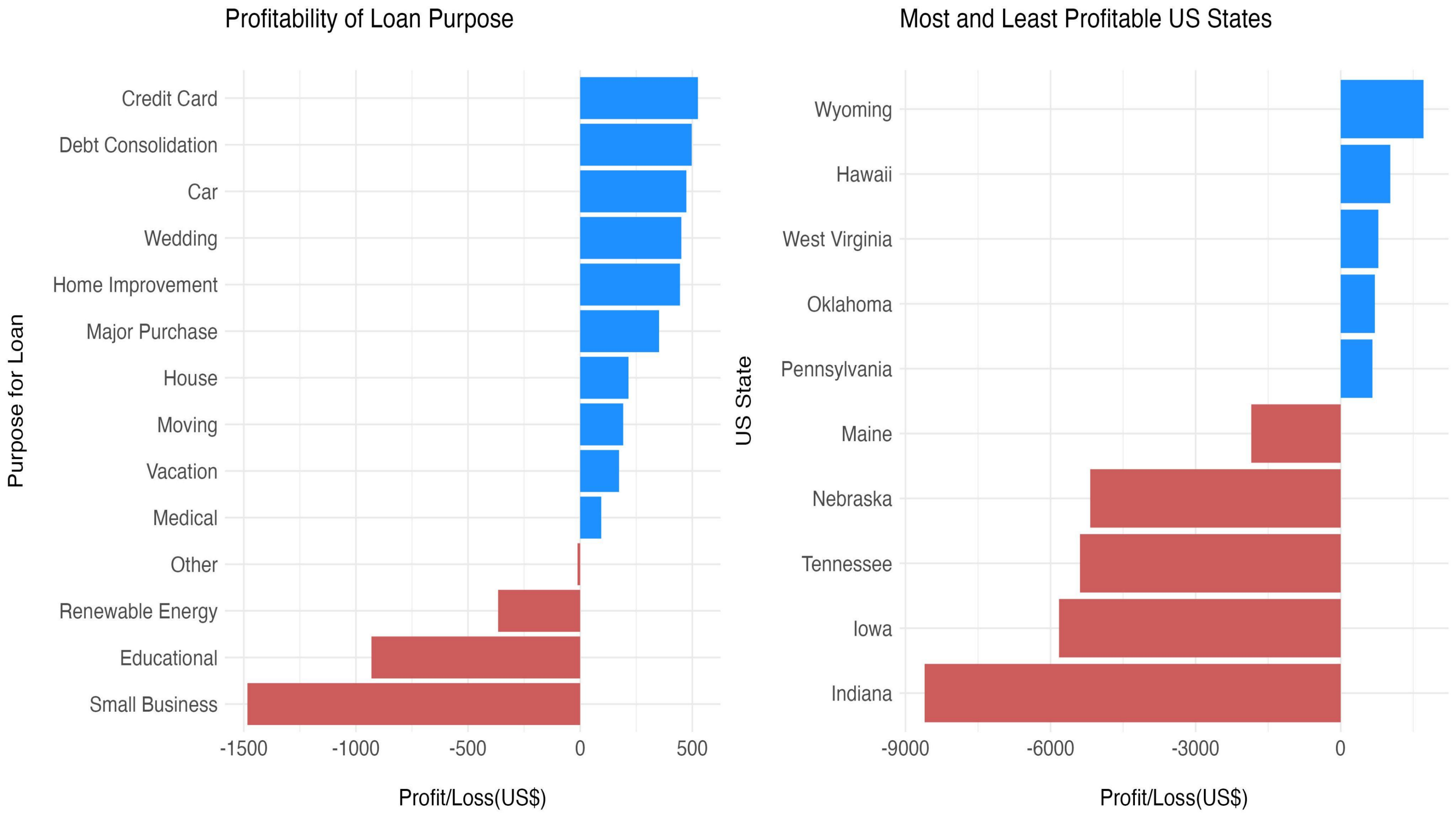
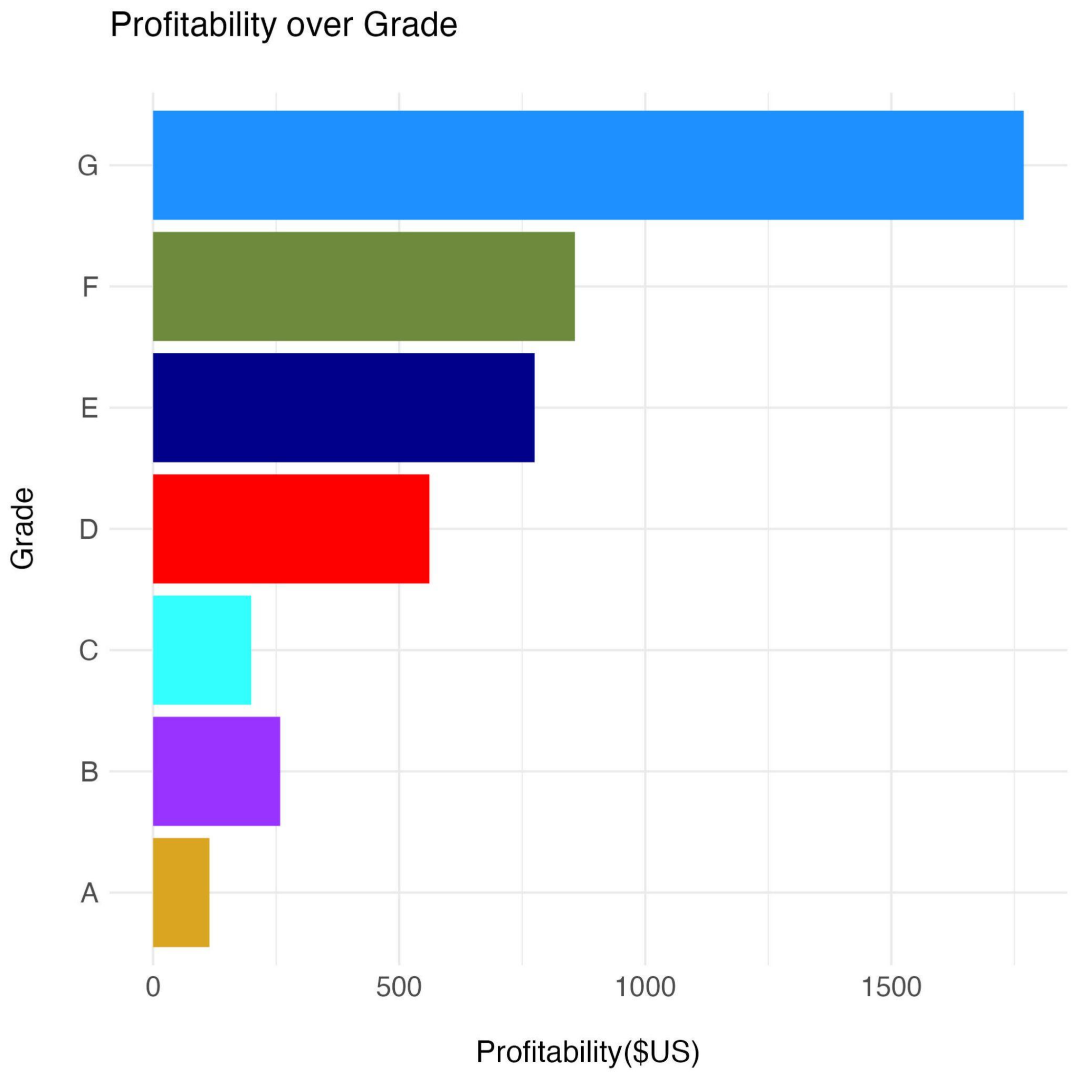

State Difference in Profitability of Loan Purpose
Nevada
New York
Profit/Loss(US$)
0
-30000
-60000
1000000
750000
500000
250000
0
Small Business
Medical
Educational
Other
Renewable Energy
Vacation
Major Purchase
House
Moving
Wedding
Car
Home Improvement
Credit Card
Debt Consolidation
Purpose for Loan


Profitability of Loan Purpose
Purpose for Loan
Credit Card
Debt Consolidation
Car
Wedding
Home Improvement
Major Purchase
House
Moving
Vacation
Medical
Other
Renewable Energy
Educational
Small Business
-1500
-1000
-500
0
500
Profit/Loss(US$)
Most and Least Profitable US States
US State
Wyoming
Hawaii
West Virginia
Oklahoma
Pennsylvania
Maine
Nebraska
Tennessee
Iowa
Indiana
-9000
-6000
-3000
0
Profit/Loss(US$)


Profitability over Grade
G
F
E
D
C
B
A
Grade
0
500
1000
1500
Profitability($US)