

Student Loan Deferment

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Agenda

1 Project Overview

2 Data Exploration

3 Data Analysis

4 Statistical Model

5 Our Findings



Facts

- **Over 50 percent of full-time college students received some form of financial help from outside their family in paying for college**
 - U.S. Census Bureau, 2006
- **Student-loan market size: \$85 billion**
 - The Education Resources Institute



Project Overview – Our Objective

- **To Answer the Question:** What are the characteristics that maximize the likelihood of a student being granted a loan deferment?
- Explanatory Analysis
- How will the model be used? Final Purpose
 - Reverse-engineer commercial lender's decision-making process in determining to grant a loan deferment or not.
- Who will use the model?
 - Students wishing to increase the likelihood of deferring a loan.

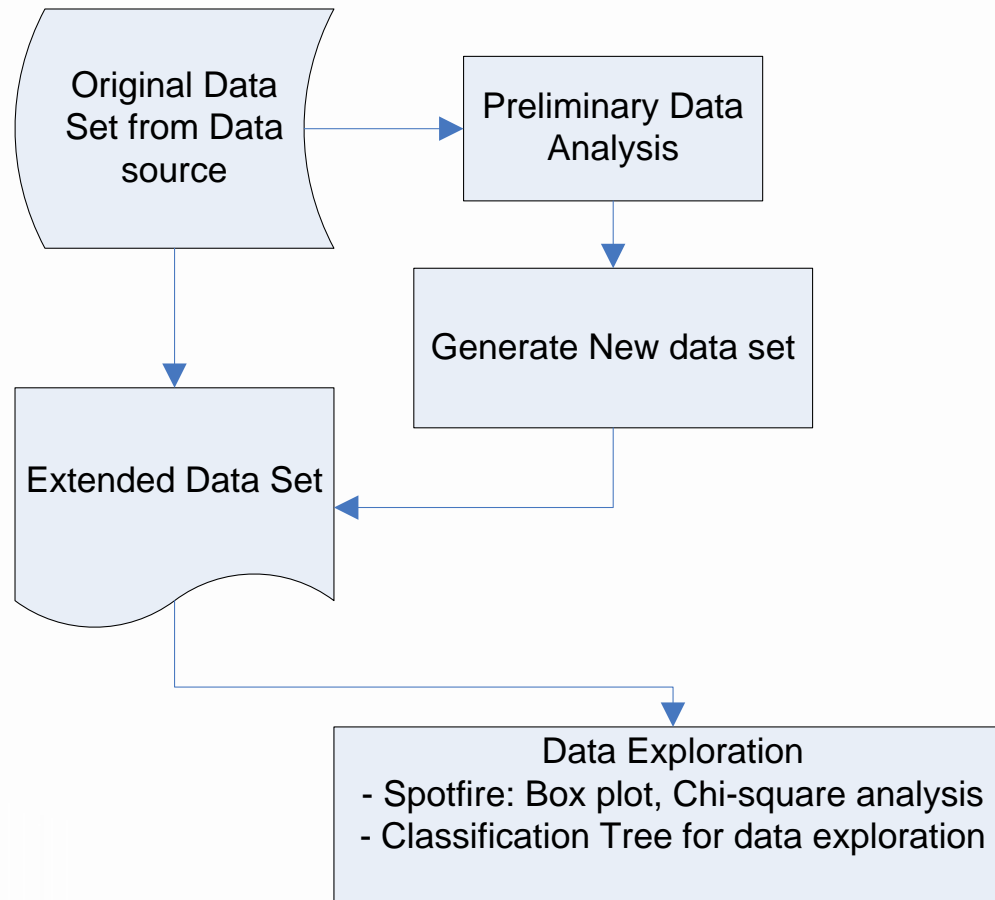


Project Overview (cont.)

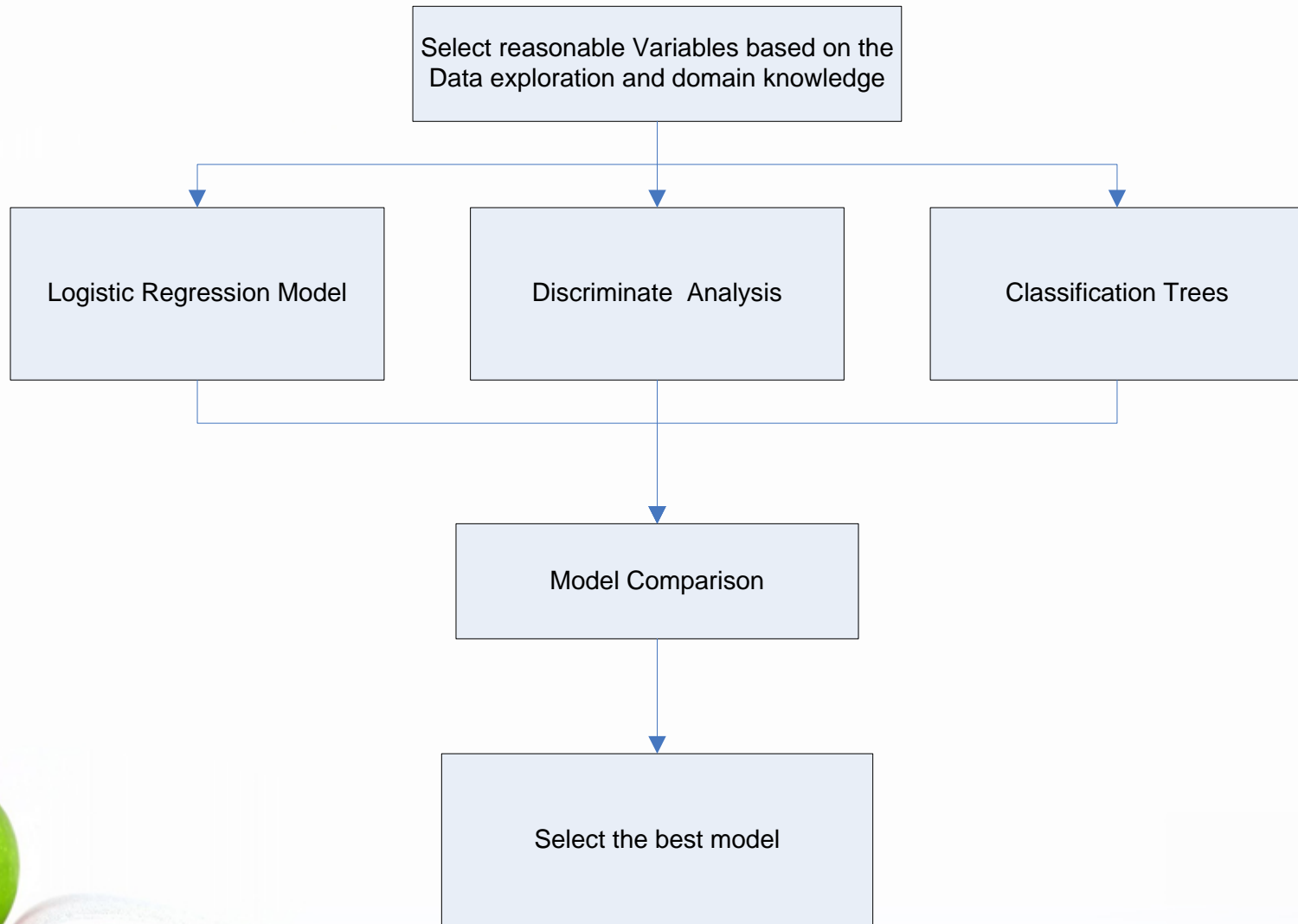
- **Education Deferments** - this type of deferment has to do with a student's enrollment status, and is sometimes referred to as an in-school deferment.
- **Economic Deferment** - generally dealing with specific types of economic hardships or unemployment.
- **Disability Deferment** - a student loan deferment program that applies to disabled students.
- **Family Related Deferments** - a loan deferment program that applies to mothers re-entering the workforce or those on parental leave.
- **Public Service Deferment** - a student loan deferment program that applies to students that are in the Armed Forces, Peace Corps, volunteers, or in public health service.



Project Overview (cont.)



Project Overview (cont.)



Data Exploration

- Source of the data
 - Machine Learning Center at the University of California, Irvine

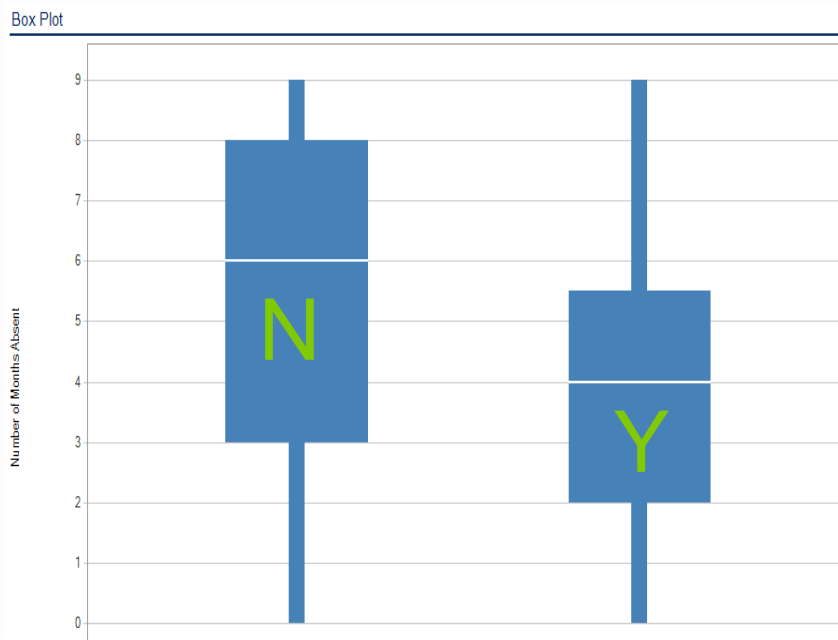
STUD_ID	NUM_MONTHS_ABSENT	DISABLED	Deferred	Bankrupcy	Sex	Employed	SCHOOL	NUM_UNITS	SERVICE
1	1	0	Y	0	1	1	occ	11	no_service
3	4	0	N	0	1	1	occ	1	no_service
4	5	0	Y	0	1	1	uci	6	marines
5	2	0	N	0	0	1	smc	5	no_service

- Data quality and size
 - Fairly reliable, less 2% missing values
 - 1000 instances of target concepts

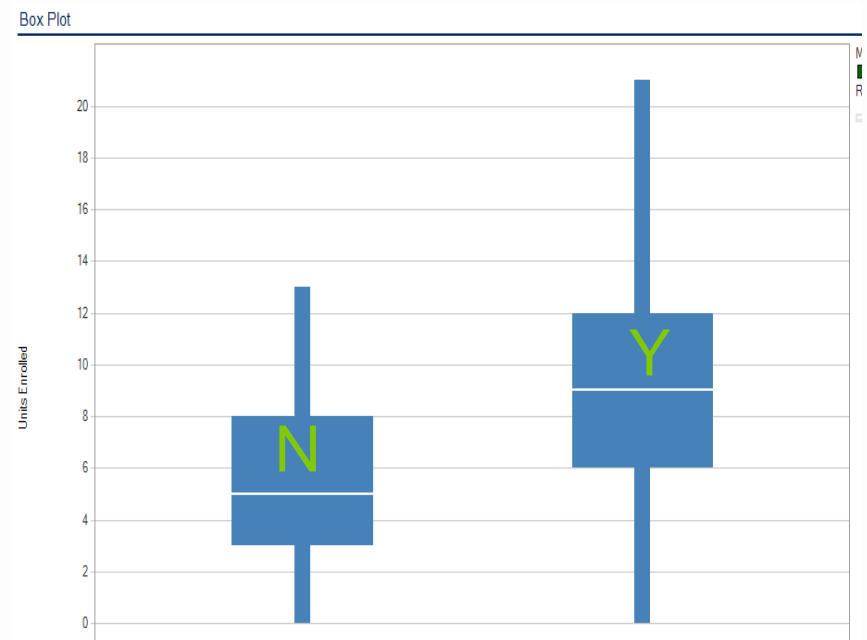


Data Visualization

Deferred vs. Months Absent



Deferred vs. Units Enrolled



Building the Model

- **Explanatory analysis recap:** Number of months absent, disability status, sex, employment status, total units, and number of services most important.

Model	Most Important Variables
Classification Tree	Total units, number of months absent, number of services
Discriminate Analysis	Employment, Num of services, Total Units, Num of months absent, Disabled, Sex
Logistic Regression	Number of services, total units, Num of months absent

LR Chosen: Reasonable, Easiest to explain, Parsimonious, 2nd overall lowest overall error rate



The Logistic Regression Model

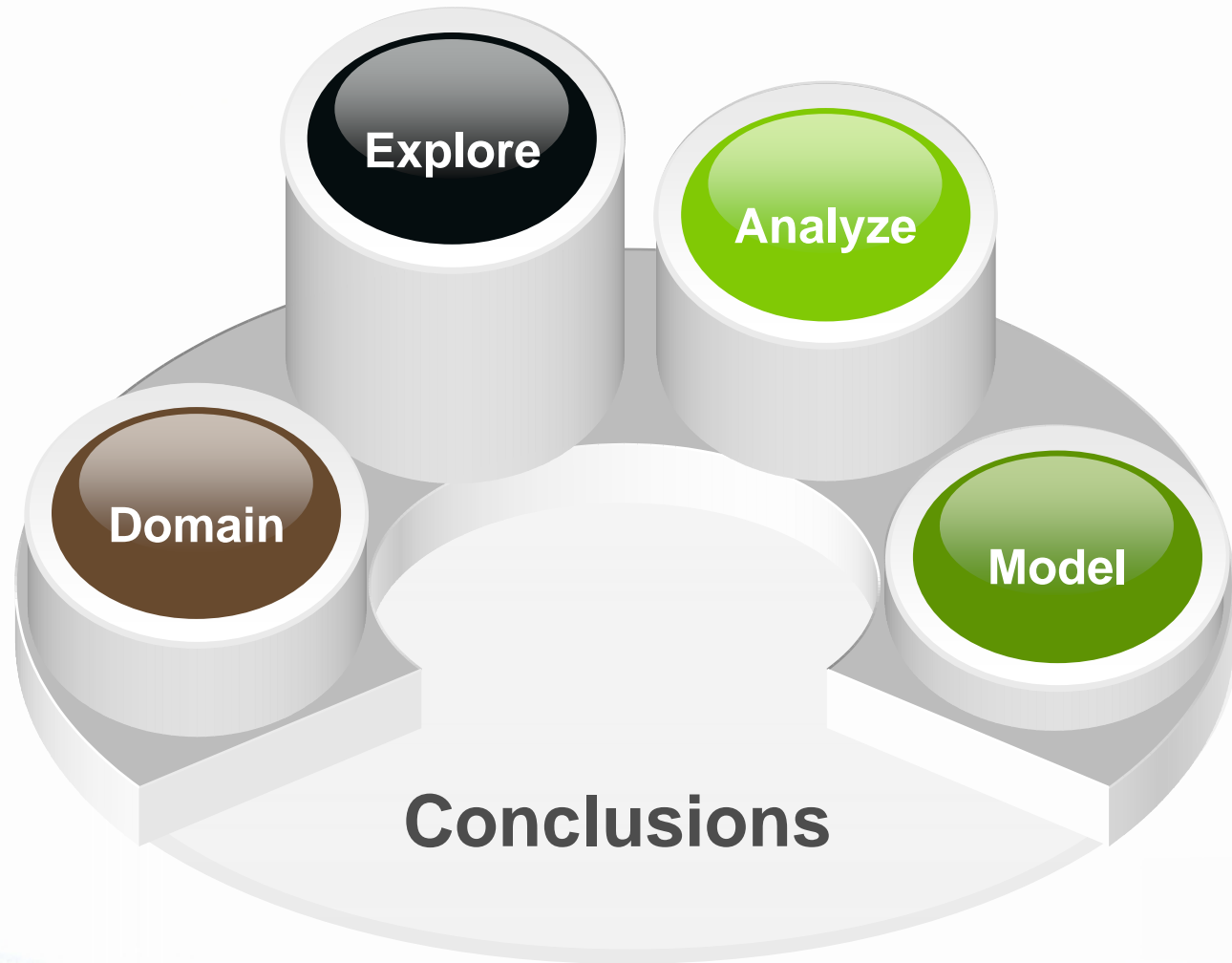
Input variables	Coefficient	Std. Error	p-value	Odds
Constant term	16.84710503	540.8853149	0.97515208	*
NUM_MONTHS_ABSENT	-0.31529847	0.0337925	0	0.7295711
DISABLED	0.39086822	0.35954201	0.27698022	1.47826374
Sex	0.13317721	0.17069066	0.43525809	1.14245248
Employed	-17.8404141	540.8852539	0.97368759	0.00000002
TOTAL_UNITS	0.33731708	0.02608318	0	1.40118325
Number of Services	1.41654301	0.20000213	0	4.12284327

Residual df	993
Residual Dev.	844.9161377
% Success in training data	64.3
# Iterations used	20
Multiple R-squared	0.35173258

Error Report			
Class	# Cases	# Errors	% Error
Y	643	85	13.22
N	357	114	31.93
Overall	1000	199	19.90



Recap



Conclusion

(How can I Obtain a Loan Deferment?)

When deciding whether to grant loan deferment, commercial lending institutions' place most importance on:

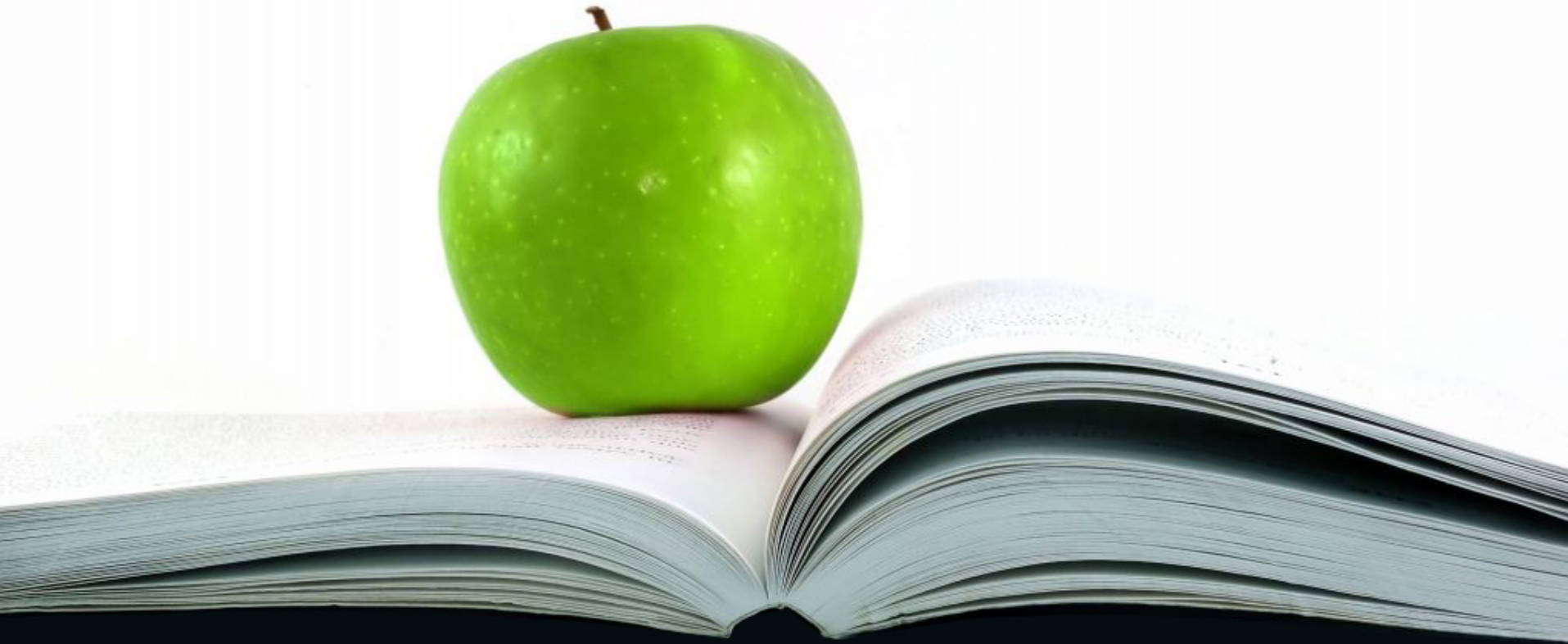
- **Total units** A full-time student or one taking more credit hours than another will have a higher likelihood of getting/his her student loan deferred.
- **Number of Services** The more services a student is part of (Army, Air Force, etc), the higher likelihood that his/her student loan will be deferred.
- **Absenteeism** The more one is absent, the less his/her likelihood of obtaining a student loan deferment.



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Questions?