

CS 3110 — Data Structures and Functional Programming

Lecture 14 Logic and Verification

6 March 2012



Software Bugs: Mariner 1

The New York Times

“The omission of a hyphen in some mathematical data caused the \$18,500,000 failure of a spacecraft launched toward Venus last Sunday, scientists disclosed today...”



Software Bugs: Therac 25

The New York Times

"A computer malfunction apparently caused excessive radiation doses for two cancer patients at a treatment center, causing the death of one man, a Texas official said today..."



Software Bugs: Stuxnet





AMERICAN EXPRESS



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1712

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MEMBER SINCE

SINCE

CUSTOMER SINCE



STATE OF CALIFORNIA
COUNTY OF SAN MATEO

VOTER REGISTRATION FORM
選民登記表

THE BALLOT ON THIS FORM MUST BE USED
選票必須填寫在表上

18-55
 18-65
 65-69
 70-74
 75-79
 80-84
 85-89
 90-94
 95-99

FIRST NAME (姓名) - 英 (請填姓氏)
Jane

CITY - 市
San Mateo

MAILING ADDRESS (若與居住地址不同，請填居住地址)
123 Main St.

CITY - 市
San Mateo

PLACE OF BIRTH (出生地點)
Year - 年

LAST NAME (姓名) - 英 (請填姓氏)
Doe

CITY - 市
San Mateo

CITY - 市
San Mateo

PLACE OF BIRTH (出生地點)
Year - 年

IF NO STREET ADDRESS, describe where you live (Cross Streets, Route Section, Range, S.E. or N.E. Corner, Box, etc.)
123 Main St.

CITY - 市
San Mateo

CITY - 市
San Mateo

PLACE OF BIRTH (出生地點)
Year - 年

MIDDLE NAME (姓名) - 英 (請填姓氏)
Doe

IF NO HOME ADDRESS (若無家庭地址)
123 Main St.

PLACE OF BIRTH (出生地點)
U.S. State or Foreign Country (請填美國州名或外國國名)

SOCIAL SECURITY NUMBER (SSN) (請填社會安全號碼)
CA 94022

PLACE OF BIRTH (出生地點)
Year - 年

STATE - 州
ZIP CODE - 郵政編碼
CA 94022

STATE - 州
ZIP CODE - 郵政編碼

SOCIAL SECURITY NUMBER (SSN) (請填社會安全號碼)

PLACE OF BIRTH (出生地點)
Year - 年

Republican Party - 共和黨
 I Decline to State a Political Party - 本人不願說明政治黨派
 Other - 其他

IF MAIL, YOU MUST PRINT YOUR FULL NAME AND ADDRESS IN BLOCK LETTERS
若用郵寄，必須用大寫字母印出全名及地址

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