

## Aside: PRISM-like example in Datalog

“In October, a foreign national named Mike Fikri purchased a one-way plane ticket from Cairo to Miami, where he rented a condo.”

`BoughtFlight('Fikri', 'Cairo',  
              'Miami', 'oneway' 4/1/2013)`

“Over the previous few weeks, he’d made a number of large withdrawals from a Russian bank account and placed repeated calls to a few people in Syria.”

`Withdrawal('Fikri', 5000, 'some bank', 4/4/2013)  
Withdrawal('Fikri', 2000, 'some bank', 4/5/2013)  
...`

“More recently, he rented a truck, drove to Orlando, and visited Walt Disney World by himself.”

`Rented('Fikri', 'truck', 'Miami', 'Orlando', 4/13/2013)`

<http://www.businessweek.com/magazine/palantir-the-vanguard-of-cyberterror-security-11222011.html>

# PRISM example modeled in Datalog

flag(person, 1, date) :- BoughtFlight(person, origin, destination, oneway, date),  
FlaggedAirports(origin),  
USAirports(destination),  
oneway='oneway'

ForeignWithdrawal(person, sum(amount), date) :-  
Withdrawal(person, amount, bank, date),  
ForeignBank(bank), amount > 1000

flag(person, 1, date) :- ForeignWithdrawal(person, totamount, date), totamount > 10k

flag(person, 1, date) :- Rented(person, vehicle, origin, dest, date), ImportantLocation(dest)

totalflags(person, sum(flag), min(date), max(date) :- flag(person, flag, date)

alert(person, flagcnt, mindate, maxdate) :-  
totalflags(person, flagcnt, mindate, maxdate),  
maxdate - mindate < 10 days, flagcnt > 3

<http://www.businessweek.com/magazine/palantir-the-vanguard-of-cyberterror-security-11222011.html>

# Another Datalog example

*Who contacted who, when? We don't care how.*

`contacted(Person1, Person2, Time) :-`  
    `email(Person1, Person2, Message, Time, ...)`

`contacted(Person1, Person2, Time) :-`  
    `called(Time, Voicemail, Person1, Person2, ...)`

`contacted(Person1, Person2, Time) :-`  
    `text_message(Time, Message, Person1, Person2, ...),`

## Another Datalog example

*Who could have known before June 3 that X was going to happen?*

`knew("Sam").`

`knew(Person2) :-` **self-reference!**

`knew(Person1)`

`email(Person1, Person2, Message, Time),  
  Time < "June 3".`

`knew(Person2) :-`

`knew(Person1),`

`met_with(Person1, Person2, Time),`

`Time < "June 3".`