

Announcements on March 21

SCONE
Lab.

● Schedule

- 3/19: Random Variables
 - Read MU 2.

- 3/21:
Random Variables (Expectation, Conditional Expectation)
 - Read MU 2.

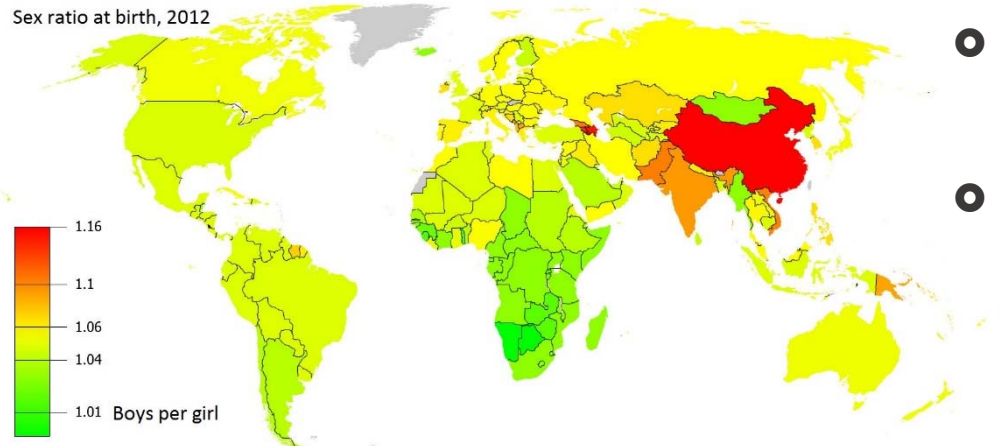
Quiz

Homework: MU Chapter 2: 2, 6, 8, 9, 18, 25, 28, 31

- 3/26: Random variables (Examples of Discrete RVs)
 - Read MU 2

Gender Imbalance

Sex ratio at birth, 2012



- To find the Girls to Boys ratio when people prefer Girls over Boys

● Assumptions:

- Married couples give births one child per birth (No twins)
- A child is either Girl or Boy with the equal prob.
- Girls are preferred over Boys and each couple keep giving births until they have a Girl
- Couples stop giving birth if they have a Girl

● Solutions

전국

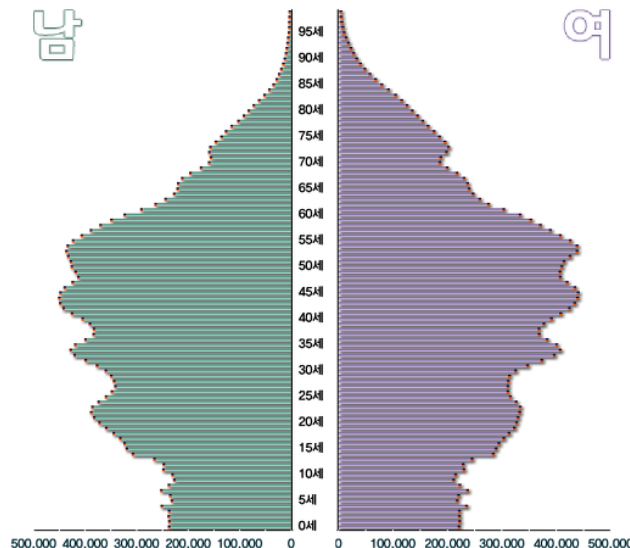
나이(세)	남자(명)
95세 이상	4,534
90 - 94	29,279
85 - 89	106,300
80 - 84	297,377
75 - 79	557,712
70 - 74	763,391
65 - 69	1,008,155
60 - 64	1,333,730
55 - 59	1,923,479
50 - 54	2,142,386
45 - 49	2,129,574
40 - 44	2,156,163
35 - 39	1,961,338
30 - 34	1,970,131
25 - 29	1,727,957
20 - 24	1,888,018
15 - 19	1,663,750
10 - 14	1,284,381
5 - 9	1,168,548
0 - 4	1,185,902

남

2015

중위(기준) 가정 선택한 가정

피라미드 도움말



나이(세)	여자(명)
95세 이상	21,964
90 - 94	104,341
85 - 89	281,611
80 - 84	561,941
75 - 79	813,471
70 - 74	957,688
65 - 69	1,113,031
60 - 64	1,407,013
55 - 59	1,933,962
50 - 54	2,113,426
45 - 49	2,096,249
40 - 44	2,083,808
35 - 39	1,885,128
30 - 34	1,836,890
25 - 29	1,551,043
20 - 24	1,637,716
15 - 19	1,511,570
10 - 14	1,191,438
5 - 9	1,098,311
0 - 4	1,111,014

Refer to MU Problem 2.8

Announcements on March 26

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● Schedule

– 3/21:

Random Variables (Expectation, Conditional Expectation)

- Read MU 2.

Quiz

Homework: MU Chapter 2: 2, 6, 8, 9, 18, 25, 28, 31

– 3/26: Random variables (Examples of Discrete RVs)

- Read MU 2

– 3/28: Moments

- Read MU 3

Figure Collection

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KBO 리그 피규어를 모아보세요!
[기간 : 7/7 ~ / 한정수량 · 랜덤증정]

두산 베어스 NC 다이노스 넥센 히어로즈 LG 트윈스 KIA 타이거즈 SK 와이번스 한화 이글스 롯데 자이언츠 삼성 라이온즈 KT 위즈

베이스볼 피규어 세트 주문 시, KBO 랜덤 피규어 증정!

베이스볼 피규어 싱글 세트 **11,000** 941kcal
베이스볼 피규어 더블 세트 **15,000** 1494kcal



Figure Collection

- Assume that the probabilities of receiving each figure type are the same
 - $\Pr(\text{Kia Tigers}) = \Pr(\text{LG Twins}) = \dots = 1/10$
- How many burgers should you eat until collecting a “Kia Tigers”?
- How many burgers should you eat until collecting all figure types?

Announcements on March 28

SCONE
Lab.

● Schedule

- 3/26: Random variables (Examples of Discrete RV)
- 3/28: Moments
 - Read MU Chapter 3
 - **HW: MU Chapter 3: 12, 13, 14, 26**
MU Chapter 4: 1, 2, 7, 9, 10, 12
- 4/02: Moments, MGF, Bounds
 - Read MU Chapter 3 & Chapter 4

How to Rank “Search Keywords”?

Google “Trend”

2018년 3월 20일 화요일

1



설현

최소 200,000명회 검색됨

설현, 과거 아이돌 고종 토로 "혼자 밥 먹고 영화 본다" 부산
그룹 AOA의 설현이 자신을 둘러싼 루머에 대해 강경대응

2



이명박

최소 2,000명회 검색됨

이명박측 "이미 예상했던 수순...법정에서 진실 밝힐 것" &
이명박 전 대통령(MB)측은 19일 검찰의 구속영장 청구에

2018년 3월 19일 월요일

1



이태임

최소 20,000명회 검색됨

배우 이태임 "평범한 삶 살기로"...활동중단 암시글 한겨레
이태임은 19일 자신의 인스타그램에 "여러 생각과 고통 속

Problem

- Millions of search keywords streamed into search engines
- Determine “Top Ten” list of most popular keywords

Naïve, but exact Solution

- Maintain a counter for each keyword
 - ➔ Millions of distinct keywords
 - ➔ Exact answer not required

Stream processing

- Complete processing in one pass while data are streaming into the system

Use various, proprietary sampling methods such as reservoir sampling

Exercise 2.18,19

Announcements on April 2

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- Schedule

- 3/28: Moments

- Read MU Chapter 3

- 4/02:

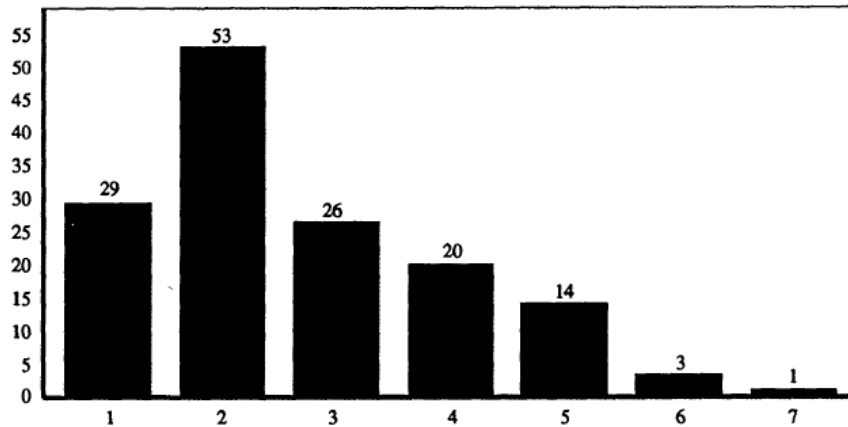
Think You're Lucky?

- In controllable circumstances or if decisions requires reasoning, people tend to over-estimate their abilities in making good decisions
 - Stock investments
 - Guess answers to questions
 - ...
- Contrarily, in the case of out-of-control circumstances, people believe they are extremely unlucky
 - It rains whenever I picnic
 - Buses came late whenever I wait buses
 - The restaurants I visited were always crowded
- Mostly untrue
- The fact is
 - You wait buses longer than half of the average inter-arrival times
 - Your friends have more friends than you

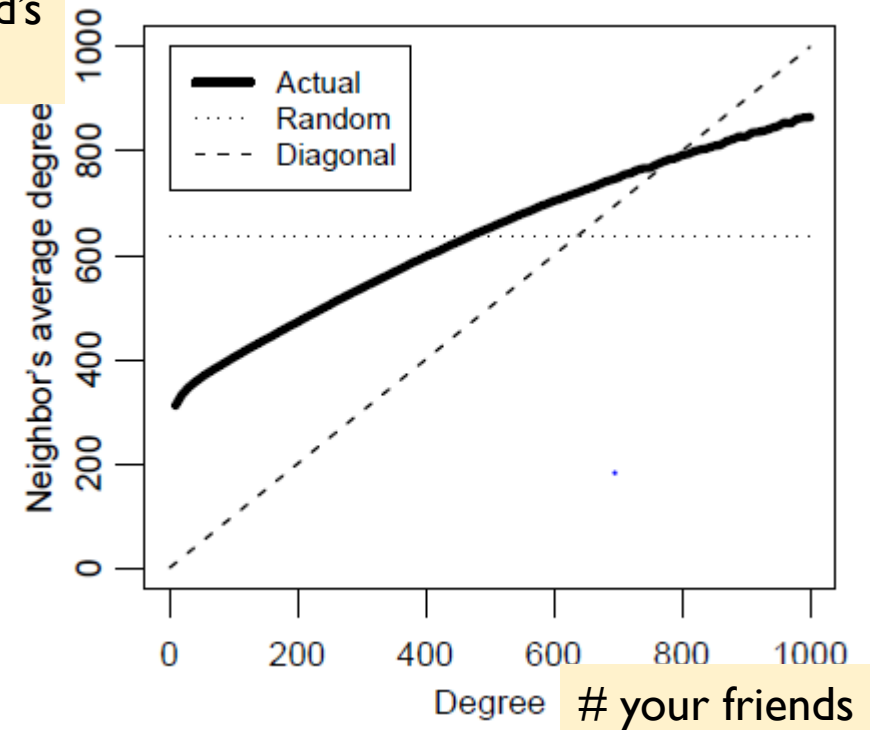
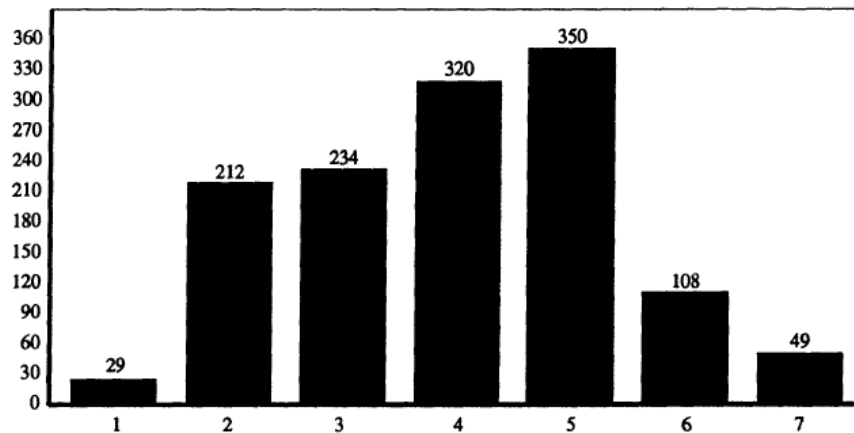
Think You're Lucky?

- Feld, a sociologist, said that “Your friends have more friends than you”

your friend's friends



a) The mean is 2.7.



Facebook Data

Why?

● Example: Waiting buses

- Assume that average bus inter-arrival time is 7.5 min. but inter-arrival times are either 5 min. or 10 min.

→ You expect the waiting of 3.75 min.



- Passengers arrive a bus stop uniformly at random
- If one arrives during a short interval, she waits 2.5 min. on average
- OW, she waits 5 min. on average
- The prob. that one arrives during a short and long interval are $1/3$ and $2/3$, respectively
- → Average waiting = $2.5 * 1/3 + 5 * 2/3 > 3.75$

● Apply the same argument and you can derive that “Your friends have more friends than you”

Regression Toward the Mean

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- Average heights of Female & Male are 165 & 175, respectively