THE UNIVERSITY OF HONG KONG
DEPARTMENT OF MATHEMATICS

CCST5037 Mathematics: A Cultural Heritage

Assignment 2

The purpose of this assignment is to investigate in what ways mathematics is presented in the internet/printed mass media and occurs in our daily life.

- Start collecting clippings that have to do with mathematics from **current** (published later than 20th September, 2023) **newspapers, magazines, or webpages** (in English or in Chinese, whose **target audience is the general public**). The items can be news, columns, advertisements, cartoons, etc.

- The connection to mathematics should be **explicitly mentioned** in the article. A mere mention of science is **not sufficient**. For example, although there are many calculations necessary for successful space travel, an article about space travel would not be sufficient unless **the article itself** mentions the mathematics (or the need for mathematics) in space travel. If **you** are making the connection with mathematics, then this is an **implicit connection**, while we are looking for articles with explicit connections.

- **Do not take** an excerpt out of a book, a magazine, or a website which is **specifically on mathematics or science per se**. E.g., clippings from magazines or websites such as *New Scientists*, *Nature*, *American Mathematical Society*, *Science News*, or from a personal blog, are not acceptable. Articles in mass media which are specifically oriented towards having **academics or experts explain their work**, even if the articles are written in a language that is not aimed at experts (remember that the purpose of this assignment is to realize that articles related to mathematics occur in our daily lives, not only in an academic setting). As a **general guideline** (this is not exhaustive), you should ask yourself whether the general public would **reasonably** likely come across this source in their **daily lives**, or if you only found the source because you did a **specific search** through a search engine. If it is the latter, then the source is probably **not valid**.

- Target number of items is **10**.

- For each of the 10 articles, please provide the following information:
    - a **picture** of it
    - For a website, please provide a screen shot of **all pages** of the article, and otherwise **scan the entire article**.
    - record the **source** and the **date** of the article
    - Write a sentence or two (in English) to **explain how the item is connected to mathematics**. Remember that the connection should be **explicit**, but you are explaining this in your words. This short description **does not necessarily need** to explain the article's relevance to the Course Learning Outcomes. It is merely a description of the connection with math.
    - If the article is in Chinese, provide a **brief description** (or a translation) **in English**.

- **In addition to** the description for each article, after collecting all of the 10 articles, you are required **to write an additional passage** containing between **200 to 300 words** with your comments about the mathematical contents of these articles and your overall view of items with relation to the **Course Learning Outcomes** (you can find the Course Learning Outcomes in the Course Description file or in the notes of Lecture 1)

- Submit your 10 items (and number them) and your type-written passage in a single PDF file through Moodle. In case the file size is too large to submit through Moodle, you may resize your picture.

- Remember to write down **your name**, **UID**, and **tutorial group** in the assignment.

- Due date: Thursday **30th November, 2023, 16:55**. No late assignments will be accepted!

Some examples of clippings are in the next few pages. Note that they were collected previously and hence are not current; but the items you collect for this assignment must be published on or later than 20th September, 2023

Item 1

Source and date: Ming Pao (明報), Dec 21, 2012

Brief translation of news content: University professor applied mathematical models to win horse race. His business partner files law suit to claim compensation.

Note to explain how this news clipping is related to mathematics: Most people would like to know secret mathematical formulas to win bets. Such mathematical knowledge, if it exists, will be sought after by many.

明報 2012.12.21 星期五 編輯 潘建文

港聞 A12

涉用數學模型贏馬 統計教授遭追彩金

【明報專訊】中文大學統計學系教授顧鳴高與生意伙伴，多年前開發「數學模型」（mathematical model），生意伙伴卻指顧鳴高違反合作協議，公器私用，以模型計出「財路」，在馬場贏得彩金，日前入稟高院要求顧賠償。

合作伙伴入稟 轟公器私用

被告顧鳴高昨接受本報查詢時表示無可奉告，但承認與原訴 Bruce James Stinson 相識。他不回應入稟狀所指的數學模型（mathematical model）是什麼。記者又問及是否憑計算機會率「賭馬」贏錢，他一笑置之，反問「許多人說今天世界末日，你信不信」。據報，原訴人爲本港一家公司的主席，該公司從事設計人力資源培訓課程，公司職員昨指原訴人不在港，不會回應案件。

問是否贏錢 答「你信不信世界末日」

入稟狀指出，2004年1月27日原訴人與被告簽訂協議，合作開發一套「數學模型」，但原訴指被告私自在賽馬博彩時使用該模型，違反合作協議。

要求交出模型最新版本

原訴要求被告交代利用該模型所贏得的彩金總額，又禁制被告繼續公器私用，只能在合作協議範圍內使用該模型，更要求被告交出模型的最新版本，並賠償損失。

「數學模型」用於表述某事物系統，以符號代表系統內不同部分，表達彼此的關係。「數學模型」不止用於統計學，自然科學如物理及生物等、社會科學上計算人口增長等，以及經濟學及其他學科皆有使用。

【案件編號：HCA2352/12】

早與賽馬結緣 講座投注作例

◀中大統計學教授顧鳴高被指公器私用，與商業伙伴開發數學模型後用以計算賽馬博彩機會率，藉此贏錢。圖為他在2010年政府與統計業界的宴會上公開演講。（網上圖片）

被指靠統計在馬場有斬獲的顧鳴高，早與賽馬「結緣」。他於2005年中大的講座中，曾以賽馬投注爲例，講解日常生活中隨機事件的機會率。

顧鳴高1998年加入中大至今，現爲統計學系教授，兼任該系研究院學部主任。他畢業於上海復旦大學數學系，於紐約哥倫比亞大學取得哲學博士銜頭，主力研究生物統計學、資料排序及風險管理等。據報，他與中共中央政治局委員李源潮分屬師兄弟，李源潮較顧早一年畢業。

聖公會大主教文告 籲反思「社會撕裂」

笨賊56秒掠10萬元燕窩 全程被攝

1 無視警鐘
閉路電影圖片顯示，兩名竊匪剪爛「地牛」及撬開鐵閘，不理警鐘大鳴，硬闖藥房爆竊。（蔡方山攝）

2 摸黑搜掠
兩名賊人分工合作，摸黑將盛載住千多元一兩的燕窩的玻璃樽放入袋中。（蔡方山攝）

3 極速逃逸
賊人在不足一分鐘內取走10萬元燕窩，迅速逃走。（蔡方山攝）

【明報專訊】兩名自以爲聰明的笨賊，昨清晨極速爆竊旺角亞皆老街一間藥房，未有任何掩飾，強行撬開藥房鐵閘，其間不顧警鐘大鳴，摸黑搜掠，短短56秒閃電掠走多樽總值逾10萬元燕窩逃去，但想不到店內設有多部紅外線閉路電視，兩匪一舉一動全被拍下來，廬山真面目亦無所遁形，警方正根據片段追緝竊匪歸案。

紅外線閉路電視拍下樣貌

警方現正通緝兩名中等身材、身高5呎7吋、犯案時分別身穿淺色及深色外套的手。

遇竊藥房位於旺角亞皆老街近黑布街地下，開業約兩年，以售賣藥材及燕窩爲主，店內除安裝警鐘外，亦有多部紅外線閉路電視。事發昨清晨5時30分，保安公司發現上述店舖警鐘大鳴，於是報警。

大批警員及店舖多名負責人聞訊趕到，只見店舖捲閘雖然關上，但兩個俗稱「地牛」的鎖頭被人剪毀，店內有被搜掠痕迹。

摸黑犯案 疑早到藥房「踩線」

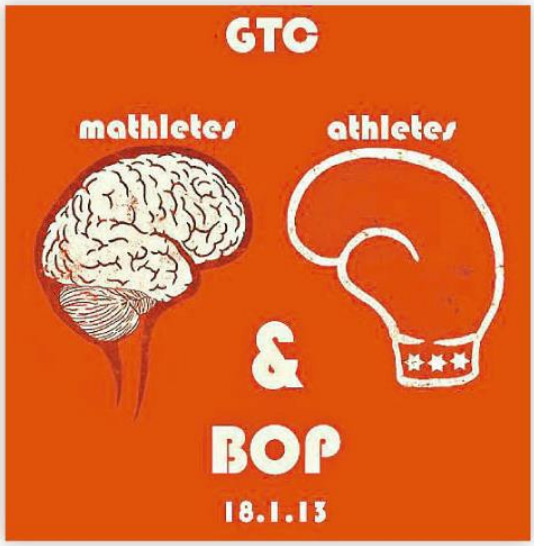
Item 2

Source and date: Ming Pao (明報), Jan 29, 2013
Note: The "mathletes vs athletes" poster shows a brain and a boxing glove. Here mathematics is associated with brain power or intelligence.

My Life at Oxford

Bops

by Amanda Yu



Poster of a Bop with the theme "Mathletes and Athletes"

Besides its tutorial system and colleges steeped in history, there is one thing well-known in Oxford — the Bops. Bops are the famous (or infamous) college parties held several times a term, full of hilarious antics (滑稽表演) and amusing costumes.

Quirkily (古怪地) themed — ranging from "Oxford pubs", "Anything but Clothes" to "Disney" — students show off their creativity and dress up as ridiculously as they could. For example, at a beach-themed Bop, people dress up as the sandman, or put on body paint.

These parties now involve copious (大量的) amounts of face paint, cross-dressing, and at times, minimal items of clothing. Dressing up is one of the greatest parts of a Bop. Students love Bops because they allow them to forget all the stress in the previous week and welcome the coming one with cheerfulness, unwinding and enjoying themselves to the fullest at a party where they virtually know everyone.

With music blasting, people dressing in ludicrous costumes, and drinks flowing, the party is essentially a big carefree activity with all your friends. For a good majority at Oxford, we work hard but we also party hard, just like every other student around the world.

Writer's Profile
Amanda is an Oxford student who shares her experiences at the prestigious university.

Item 3

Source and date: Mail Online, Nov 1, 2012

URL:
http://www.dailymail.co.uk/sciencetech/article-2226247/Maths-really-CAN-make-head-hurt-researchers-say.html#axzz2JjjaNpVc

Note: Here is some medical evidence to show that, at least for some people, the "pain" of doing mathematics is real.

Maths really CAN make your head hurt, researchers say

- **Researchers say a fear of maths can activate regions of the brain linked to physical pain**
- **Claim fear is caused by anticipation**

PUBLISHED: 12:21 GMT, 1 November 2012 | **UPDATED:** 15:23 GMT, 1 November 2012

Fear of maths can activate regions of the brain linked with the experience of physical pain, a study has found.

The higher a person's anxiety of a maths task, the more it increases activity in regions of their brain associated with visceral threat detection, and often the experience of pain itself, according to researchers Ian Lyons and Sian Beilock, from the University of Chicago, in the journal Plos One.

The authors say that previous research has shown that other forms of psychological stress, such as social rejection or a traumatic break-up, can also elicit feelings of physical pain.

Researchers say that the anticipation of having to do maths can trigger regions in the brain associated with physical pain

However, they say their study examines the pain response associated with anticipating an anxiety-provoking event, rather than the pain associated with a stressful event itself.

The authors say their results indicate the maths task itself is not painful but merely the thought of it is highly unpleasant to certain people.

Today's headlines | Most Read

- **One small hut for man: European Space Agency unveils plans for mankind's first habitable MOON BASE... built almost entirely out of lunar soil by robots**
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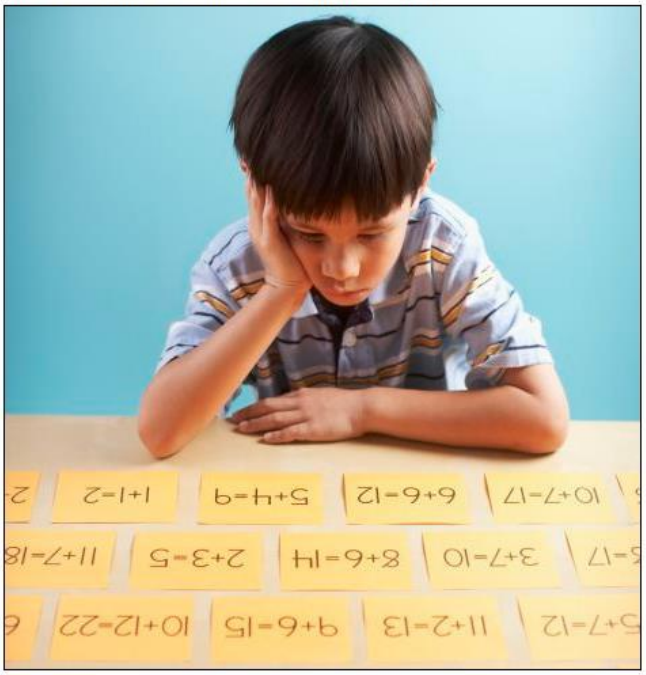
- **The many faces of the Sun: Nasa reveals stunning 'patchwork quilt' of solar surface**
- So close you can almost feel the heat: Spectacular 360-degree interactive panorama shows Russian volcano erupting
- **'It was better for them to die unexpectedly': NASA expert reveals Columbia shuttle crew were not told of problem with re-entry as families mark 10-year anniversary**
- See how a fish thinks! Incredible video that shows a thought swimming through the brain of a Zebrafish
- **Bigger really is better! Fiat 500 named worst car for passenger injuries**
- Scientists discover how owls rotate their heads without cutting off blood supply
- **Top footballers are cleverer than university students because 'hyper focus' gives them a mental edge**
- Will Apple sue BlackBerry over its 'iPhone copy'? Firm could take action as Europe boss refuses SIX TIMES to admit Z10 looks just the same
- **Why Nigella Lawson could offer the perfect shoulder to cry on: Women in their 50s have the**

'Math can be difficult, and for those with high levels of mathematics-anxiety (HMAs), math is associated with tension, apprehension and fear," the authors said in their paper titled, When Math Hurts.

'Interestingly, this relation was not seen during math performance, suggesting that it is not that math itself hurts, rather, the anticipation of math is painful.

'Our data suggest that pain network activation underlies the intuition that simply anticipating a dreaded event can feel painful.



The researchers found some people suffer from major anxiety around maths.

'These results may also provide a potential neural mechanism to explain why (people with) HMAs tend to avoid math and math-related situations, which in turn can bias (those with) high levels of mathematics-anxiety away from taking math classes or even entire math-related career paths.

'We provide the first neural evidence indicating the nature of the subjective experience of math-anxiety.'

The researchers used 14 people with HMAs and 14 who had low levels of maths anxiety.

The subjects were then asked to complete word tasks and maths tasks.

- Moth-massacre: Two-thirds of Britain's species die out in just 40 years
- **Genetically modified version of herpes virus 'can block spread of ovarian and breast cancer'**
- Outrage over Boyfriend Trainer iPhone game that 'encourages domestic violence'
- **Stroke of genius! Scientists close to discovering the secret behind why humans and animals love to be caressed**
- MORE HEADLINES

FEMAIL TODAY

Trendy birthday: Harry Styles celebrates 19th with Nick Grimshaw and star pals... while bandmate Liam Payne heads out elsewhere
Partied with Pixie Geldof

First holiday as a single lady: A sullen Kelly Brook shows off incredible physique as she sunbathes alone in emerald bikini
Relaxing in Miami

Less time in the make-up chair Khloe! Kardashian sister is barely recognisable with inches of face paint
She's under there somewhere, we promise

Macaulay Culkin opens the doors of his trippy $2million apartment-turned-art studio strewn with cigarettes and alcohol
He looks healthier now

Up all night... with a stripper: The 'waitress' Zayn Malik 'cheated' on Perrie Edwards with is a £500-a-hour private dancer
Worked at London club

That isn't helping those pregnancy rumours!

Examples that are NOT acceptable:

- Published before September 20, 2023 (i.e., the article appeared any day up to and including September 19, 2023).

- Not published in mass media and/or not published with the general public as its intended audience. For example, journal articles like Nature, Bulletin of the American Mathematical Society, personal blogs, etc.

- Mass media specifically only containing articles authored by academics (or area-specific experts) in order to explain their work to those with an interest in this specific area (even if the audience is non-experts and the language is not specific to experts). For example, articles from websites like "The Conversation", which has articles all authored by academics but written in a language for non-experts to read.

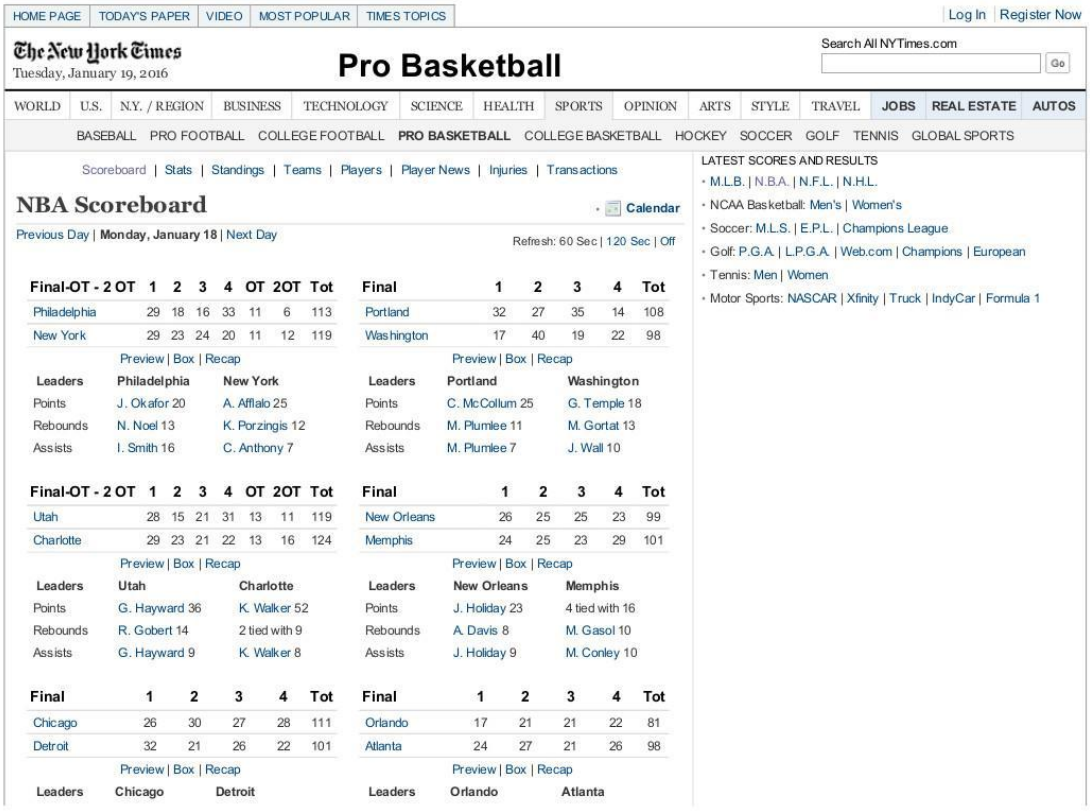
- Articles containing data but with **no analysis** of this data.

- Example:
    - **Bad**: An article about the "Million People March against Police Brutality" – Description "One Million is a number."
    - **Better**: An article about "how big" one million is; the article mentions the same "million people march" and then discusses how big one million is, giving an example like a discussion of long it would it take to count to one million seconds.

The following example **WOULD NOT BE ACCEPTABLE:**

Item 4 (**receiving no credit!**)

Source and Date: The New York Times, January 19, 2016
URL: http://nytimes.stats.com/nba/scoreboard.asp
There are many numbers which appear on the NBA scoreboard.



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The New York Times
Tuesday, January 19, 2016

Pro Basketball

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Scoreboard | Stats | Standings | Teams | Players | Player News | Injuries | Transactions

NBA Scoreboard

Calendar

Previous Day | **Monday, January 18** | Next Day

Refresh: 60 Sec | 120 Sec | Off

Final-OT - 2 OT	1	2	3	4	OT	2OT	Tot
Philadelphia	29	18	16	33	11	6	113
New York	29	23	24	20	11	12	119

Preview | Box | Recap

Leaders	Philadelphia	New York
Points	J. Okafor 20	A. Afflalo 25
Rebounds	N. Noel 13	K. Porzingis 12
Assists	I. Smith 16	C. Anthony 7

Final	1	2	3	4	Tot
Portland	32	27	35	14	108
Washington	17	40	19	22	98

Preview | Box | Recap

Leaders	Portland	Washington
Points	C. McCollum 25	G. Temple 18
Rebounds	M. Plumlee 11	M. Gortat 13
Assists	M. Plumlee 7	J. Wall 10

Final-OT - 2 OT	1	2	3	4	OT	2OT	Tot
Utah	28	15	21	31	13	11	119
Charlotte	29	23	21	22	13	16	124

Preview | Box | Recap

Leaders	Utah	Charlotte
Points	G. Hayward 36	K. Walker 52
Rebounds	R. Gobert 14	2 tied with 9
Assists	G. Hayward 9	K. Walker 8

Final	1	2	3	4	Tot
New Orleans	26	25	25	23	99
Memphis	24	25	23	29	101

Preview | Box | Recap

Leaders	New Orleans	Memphis
Points	J. Holiday 23	4 tied with 16
Rebounds	A. Davis 8	M. Gasol 10
Assists	J. Holiday 9	M. Conley 10

Final	1	2	3	4	Tot
Chicago	26	30	27	28	111
Detroit	32	21	26	22	101

Preview | Box | Recap

Leaders	Chicago	Detroit

Final	1	2	3	4	Tot
Orlando	17	21	21	22	81
Atlanta	24	27	21	26	98

Preview | Box | Recap

Leaders	Orlando	Atlanta

LATEST SCORES AND RESULTS

- M.L.B. | N.B.A. | N.F.L. | N.H.L.
- NCAA Basketball: Men's | Women's
- Soccer: M.L.S. | E.P.L. | Champions League
- Golf: P.G.A. | L.P.G.A. | Web.com | Champions | European
- Tennis: Men | Women
- Motor Sports: NASCAR | Xfinity | Truck | IndyCar | Formula 1