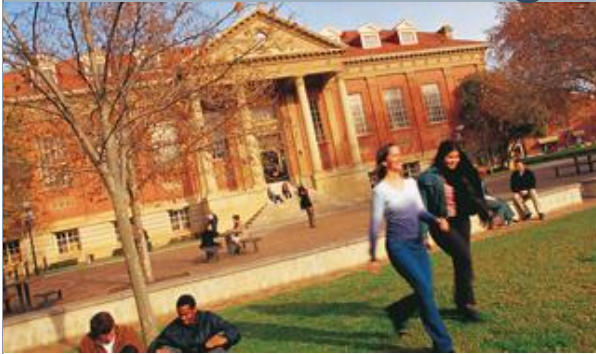




Group 32: Code Cracking: Who Murdered The Somerton Man?



Final Seminar

Supervisors: Professor Derek Abbott and Dr. Matthew
Berryman

Students: Nicholas Gencarelli and Jikai Yang



Outline of Presentation

- Introduction
 - History and Background
 - Project Aims and Motivation
- Approach and Methodology
- Previous Studies
- Specific Tasks
 1. Statistical Frequency Analysis of Letters
 2. N-Gram Search
 3. Rubaiyat Omar Khayyam as One-Time pad
 4. Statistical Frequency of Letters Reanalysis
- Project Management
 - Task Allocation
 - Budgeting
 - Risk Assessment
 - Gantt Chart
 - Communication
- Relationship to possible career paths
- References
- Questions





Introduction: History and Background



Figure 1: *The Herald Sun*

Who:

An unidentified man

Time of death:

Found at 6:30am on the 1st of December 1948

Cause of death:

Unknown

Location of death:

Found at Somerton Beach, South Australia





Introduction: History and Background

- Why did the public show significant interest in this case?
 - The man lacked any identification
 - The cause of death was unknown, potentially an undetectable poison
 - The case occurred during the heightened tension of the Cold War
 - A page from a book with some letters written on it was found in his pocket
 - These letters have been a mystery until today





Introduction: Existing Evidence

- A brown suitcase
 - Found at the Adelaide Railway Station
 - A package of thread was found inside the suitcase that was used to repair the lining in the trousers the Somerton Man was wearing



Figure 2: *The Herald Sun*



Introduction: Existing Evidence

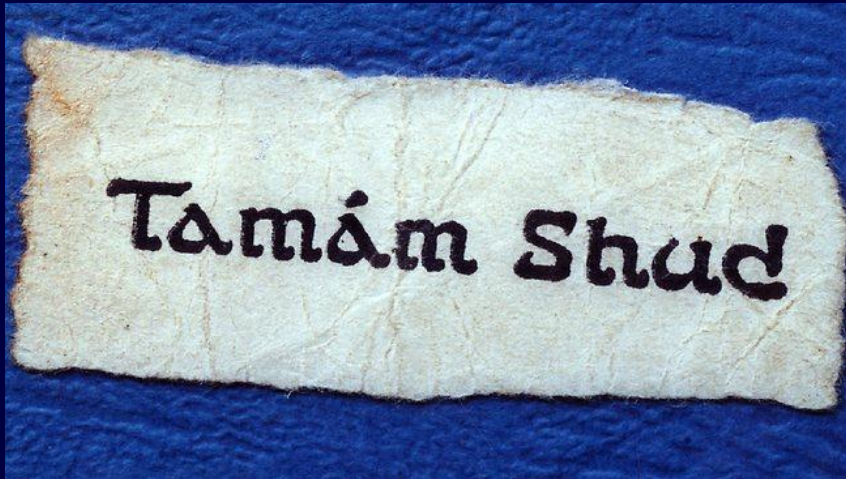


Figure 3: *The Herald Sun*

- A scrap of paper
 - Found in the man's trouser pocket
 - “Tamam Shud” translating to “it is finished” in Persian





Introduction: Existing Evidence

- Letters written on a page out of *Rubaiyat of Omar Khayyam*.

WRGOABABD

MLIAQI

WTBIMPANETP

MLIABO AIAQC

ITTMTSAMSTGAB

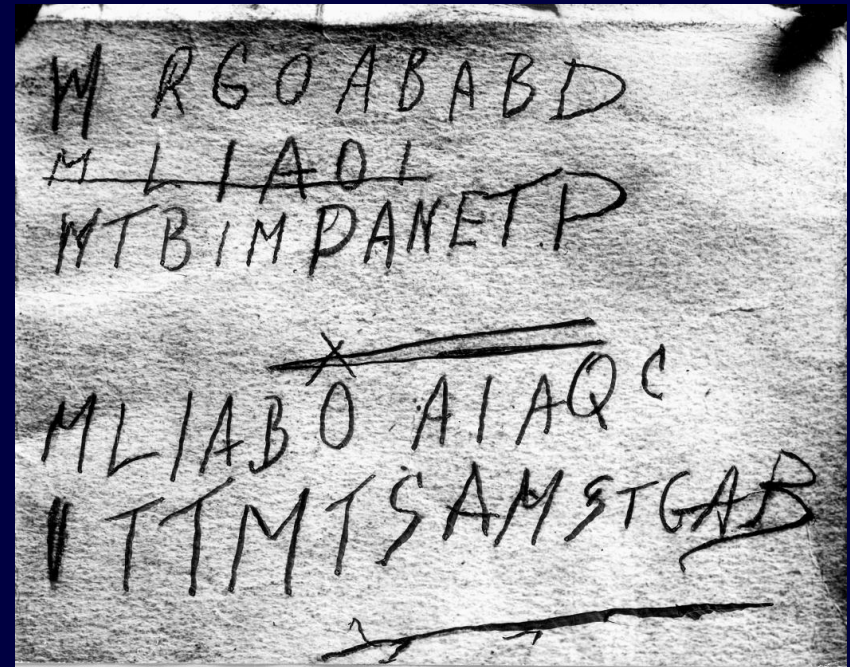


Figure 4: *The Herald Sun*





Introduction: Project Aims and Motivation

- In this project, our group will attempt to solve a suspected murder that took place in Adelaide in 1948.
- The ultimate aim is to decrypt the code in order to solve the mystery, but this may be somewhat unrealistic as the code has remained uncracked for many years.
- However, we will utilise computational techniques to attempt the decryption.





Approach and Methodology: P -Value

- In statistics, the p -value is a function of the observed sample results that is used for testing a statistical hypothesis.
- We will use p -value to do some simple tests to determine if English was the language in the original message.

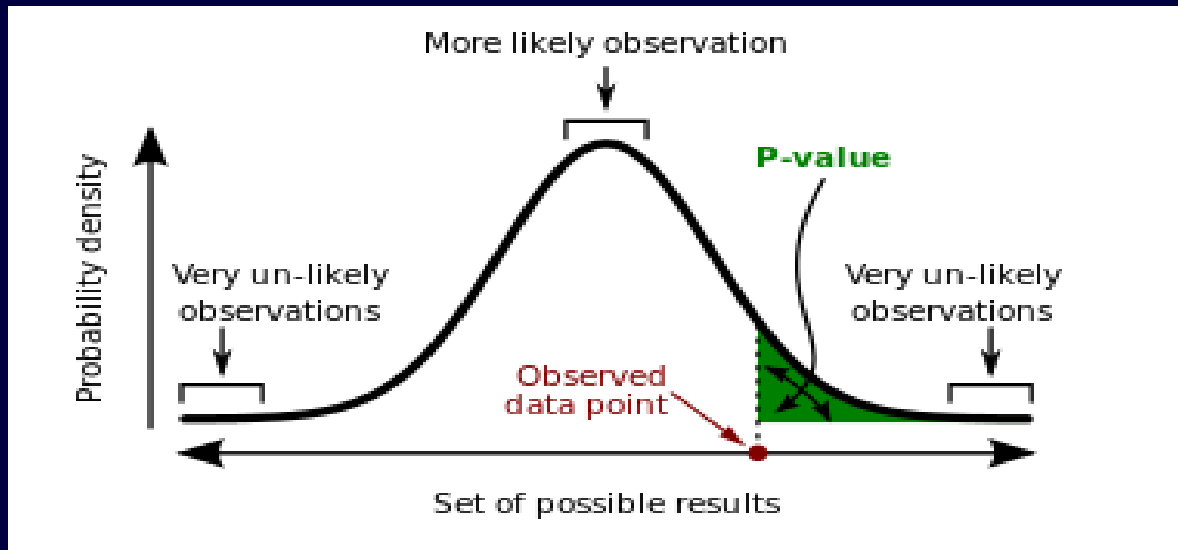


Figure 5: Wikipedia





Approach and Methodology: Chi-Squared test

- Chi-square is a statistical test commonly used to compare observed data with expected data
- Since it is a non-parametric test, it doesn't care about distribution of samples
- 'Goodness of Fit' test, meaning it measures how closely one group of data is related to another
- We will use chi-squared test to calculate and analyse our task 1 Statistical Frequency Analysis of Letters

English		Frequency	Code	Frequency
A:	7935	0.108153	8	0.181818
B:	3038	0.041408	5	0.113636

$$\frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

$$= \frac{(8 - (44 \times 0.108153))^2}{44 \times 0.108153}$$





Approach and Methodology: *N*-Gram Model

- An *n*-gram model is a type of probabilistic language model for predicting the next item in a sequence in the form of a $(n - 1)$ -order.
- We will be using an *n*-gram database to find common groups of words for a variety of initialisms.

Sample Sequence	1-gram sequence	2-gram sequence	3-gram sequence	<i>n</i> -gram sequence
MLIABOAIQA C	M, L, I, A, B, O, A, I, A, Q, C	ML, LI, IA, AB, BO, OA, AI, IA, AQ, QC	MLI, LIA, IAB, ABO, BOA, OAI, AIA, AQC





Approach and Methodology: One-Time pad

- In cryptography, a one-time pad is an encryption technique that cannot be cracked if used correctly.
- We should be able to verify and prove if the code is the beginning letter of a sequence of words, or is composed of whole words.

	E	Q	N	V	Z	ciphertext
	4 (E)	16 (Q)	13 (N)	21 (V)	25 (Z)	ciphertext
-	23 (X)	12 (M)	2 (C)	10 (K)	11 (L)	key
=	-19	4	11	11	14	ciphertext - key
=	7 (H)	4 (E)	11 (L)	11 (L)	14 (O)	ciphertext - key (mod 26)
	H	E	L	L	O	→ message

Figure 6: Wikipedia





Approach and Methodology: Universal Declaration of Human Rights

- In 1948, the United Nations General Assembly adopted this bill of human rights to represent a common standard for all people and all nations.
- There are 444 different language translations.

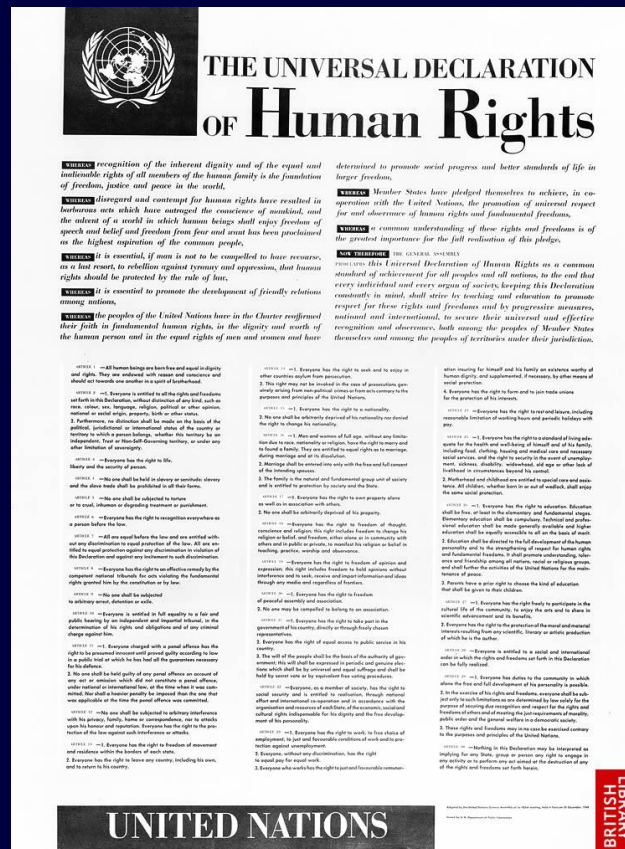


Figure 7: British Library



Approach and Methodology: Project Gutenberg

- PG is a volunteer effort to digitise and archive cultural works.
- First document posted in 1971.
- Over 50,000 books are available in plain text and other formats like HTML, PDF and EPUB as eBooks.
- It is all free to use and includes major languages in the world.





Previous Studies: Previous Professional Attempts

- Limited techniques
- Fixed assumptions
- Navy: “Neither a code nor a cipher”
- Department of Defense:
 - “There are insufficient symbols to provide a pattern.”
 - “The symbols could be a complex substitute code or the meaningless response to a disturbed mind.”
 - “It is not possible to provide a satisfactory answer.”





Previous Studies: Honours Projects 2009-2013

- Letter frequency analysis
- Initial letter and sentence letter probabilities
- Probabilities of known cypher techniques
- One-time pads
- Web Crawler
- Text type analysis
- Pattern matching
- 3D generated reconstruction of bust (See Fig. 8)
- Mass spectrometer data hair analysis

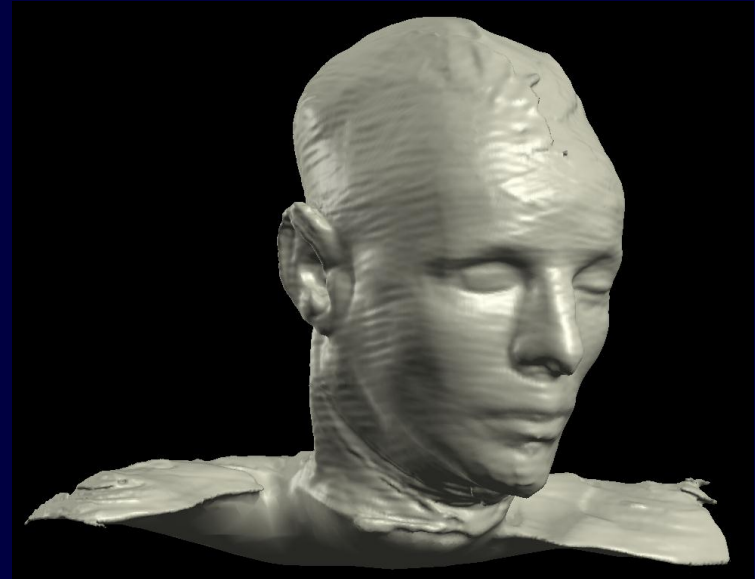


Figure 8: *Final Report 2012*





Previous Studies: Honours Projects 2009-2013

- Conclusions:
 - Letters unlikely to be random
 - Likely to be initialism
 - Likely to use Rubaiyat as one-time pad
 - Likely to be English
 - Unlikely to be an initialism of a poem
 - Rubaiyat not used as straight substitution one-time pad





Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

Aims:

- Use statistical methods to verify whether the most possible language of Somerton Code is English
- Critical review of previous results
- Universal Declaration of Human Rights as base text
- Find out how common letters are in each language





Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

Method:

- Initially tried ANOVA, but did not produce valid results since used mean and standard deviation of letter frequencies
- Instead attempted using non-parametric Chi-Squared testing method





Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

- During our chi-squared value calculation, the count number of some letters from sample languages were 0. Using the chi-squared value formula:

$$\frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

It resulted in expected values becoming 0. Since the denominator cannot be 0, we instead used a count of 1 instead of 0 for these letters. We also used 0.0001 instead of frequency 0 for the letters to double check our result.

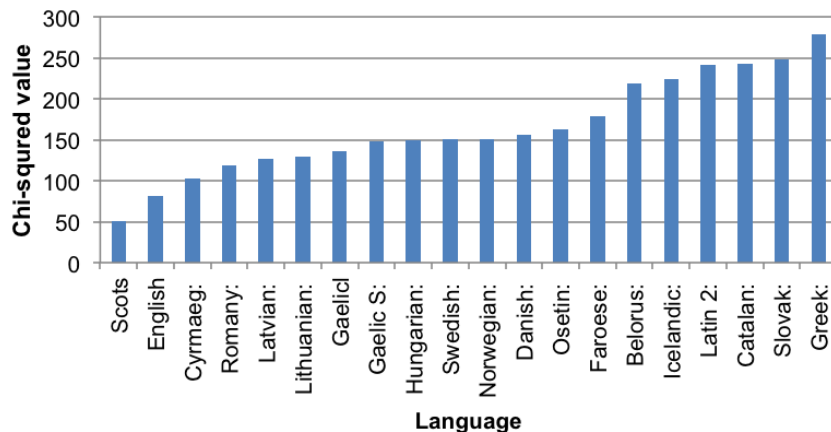




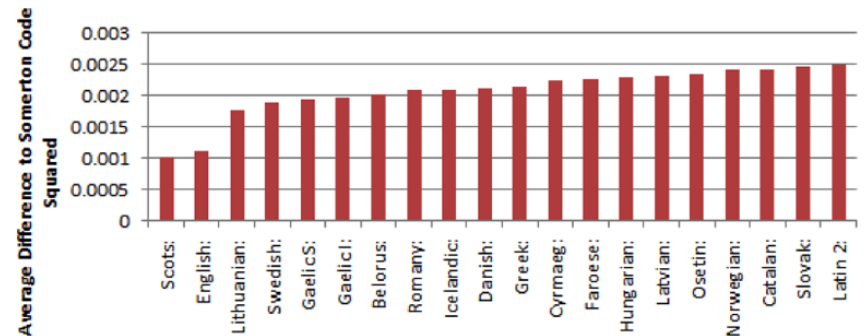
Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

Chi-Squared Values of Closest 20 Languages based on 2013 Squared Difference (5Ms & 1W in Code)



Closest 20 Languages by Squared Difference EUROPE



(Count from 0 to 1)

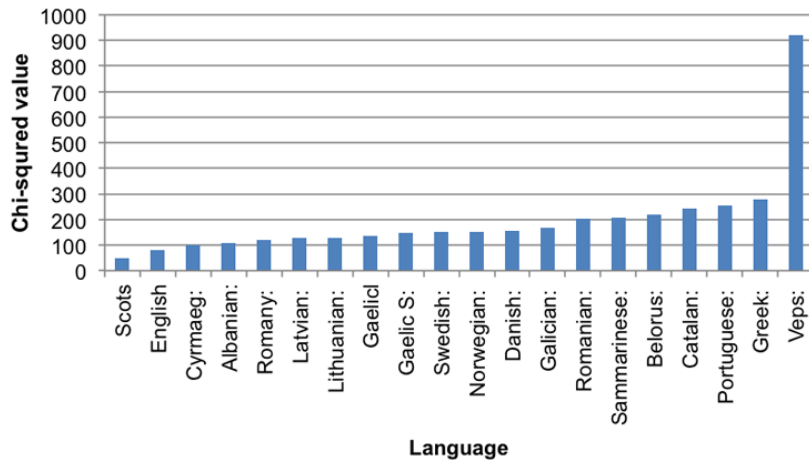




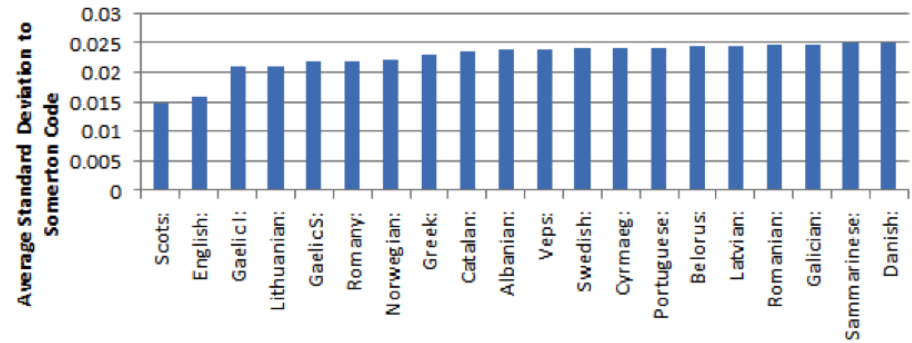
Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

Chi-Squared Values of Closest 20 Languages based on 2013 Standard Deviation (5Ms & 1W in Code)



Closest 20 Languages by Standard Deviation EUROPE



(Count from 0 to 1)

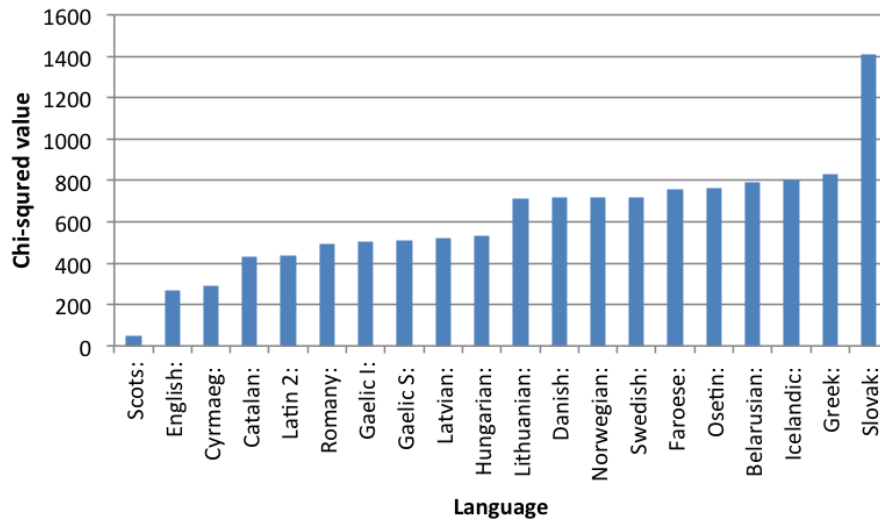




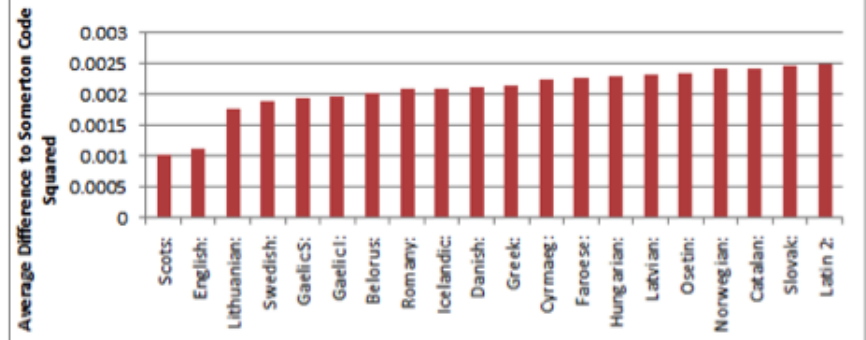
Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

Chi-Squared Values of Closest 20 Languages based on 2013 Squared Difference (5M 1W)



Closest 20 Languages by Squared Difference EUROPE



(Frequency 0.0001)

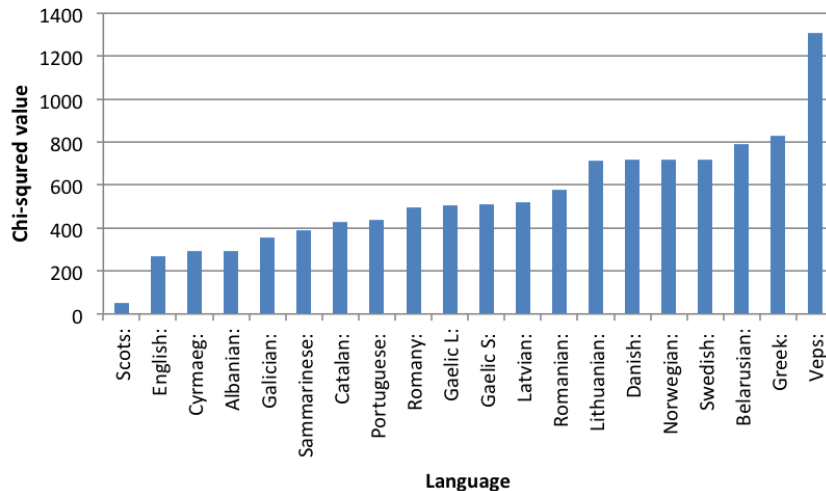




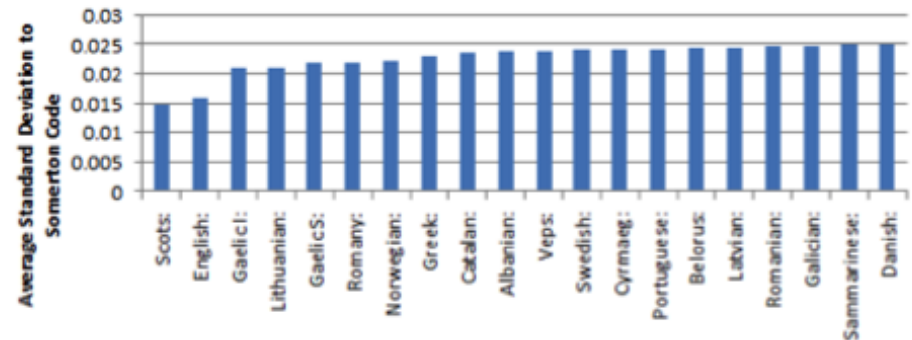
Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

Chi-Squared Values of Closest 20 Languages based on 2013 Standard Deviation (5M 1W)



Closest 20 Languages by Standard Deviation EUROPE



(Frequency 0.0001)

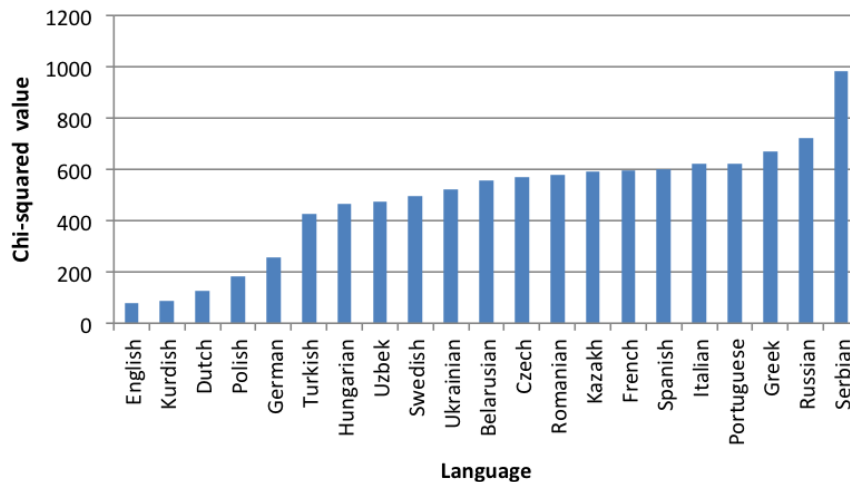




Specific Tasks:

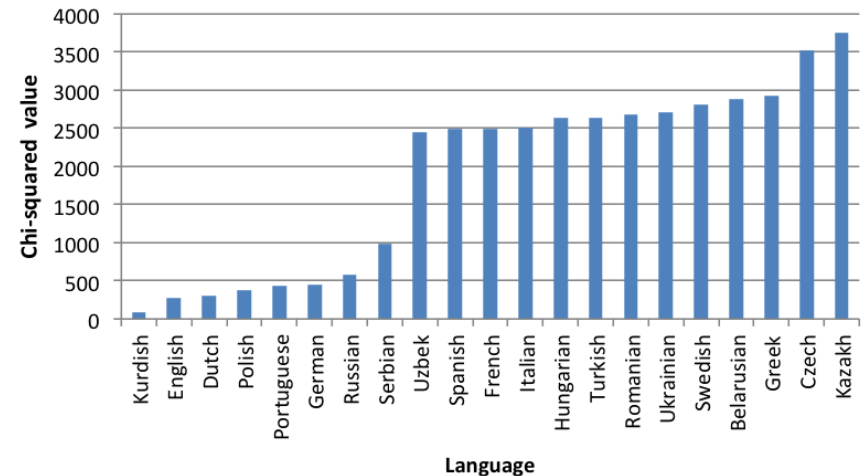
Task 1: Statistical Frequency Analysis of Letters

Top 20 European Languages based on Estimated Number of Speakers (Average)



(Count 0 to 1)

Top 21 European Languages based on Estimated Number of Speakers (Average)



(Frequency 0.0001)

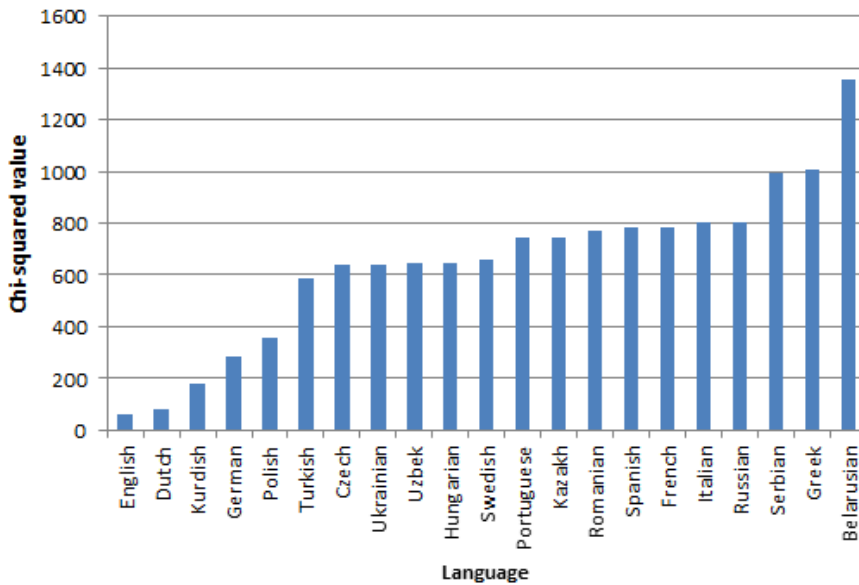




Specific Tasks:

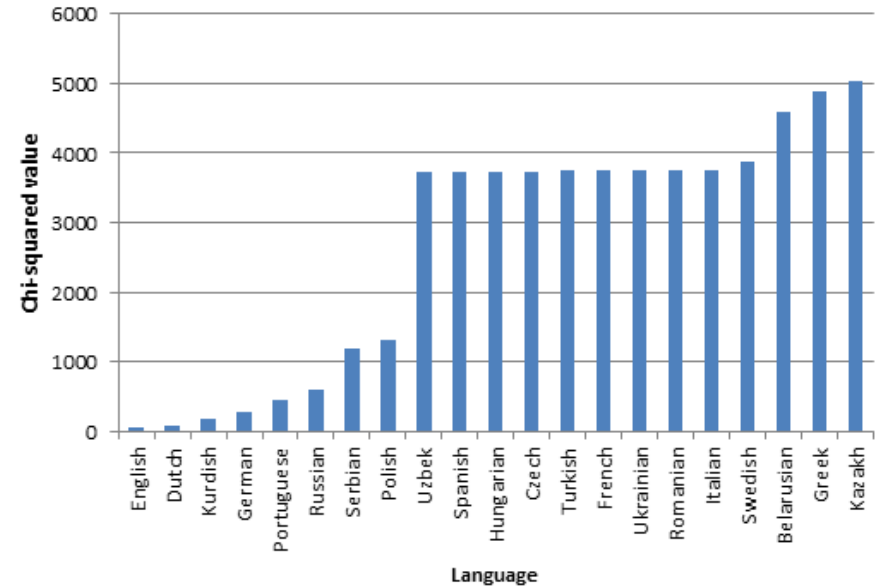
Task 1: Statistical Frequency Analysis of Letters

Top 20 European Languages based on Estimated Number of Speakers vs Thomas Hardy Sample(number 0 to 1)



(Count 0 to 1)

Top 20 European Languages based on Estimated Number of Speakers vs Thomas Hardy Sample(frequency 0 to 0.001)



(Frequency 0.0001)





Specific Tasks:

Task 1: Statistical Frequency Analysis of Letters

Results for using Chi-squared test:

- Previous results using the Universal Declaration of Human rights as a base text were confirmed
- The Universal Declaration of Human rights as a base text was found to have too small a sample size to accurately reflect letter frequencies in languages
- English had the lowest chi-squared value for most of the calculations, which means the Somerton Code is most likely be English. However, we still could not get a reasonable p-value for any languages against the code, so there was potential for reanalysis





Specific Tasks: Task 2: N-Gram Search

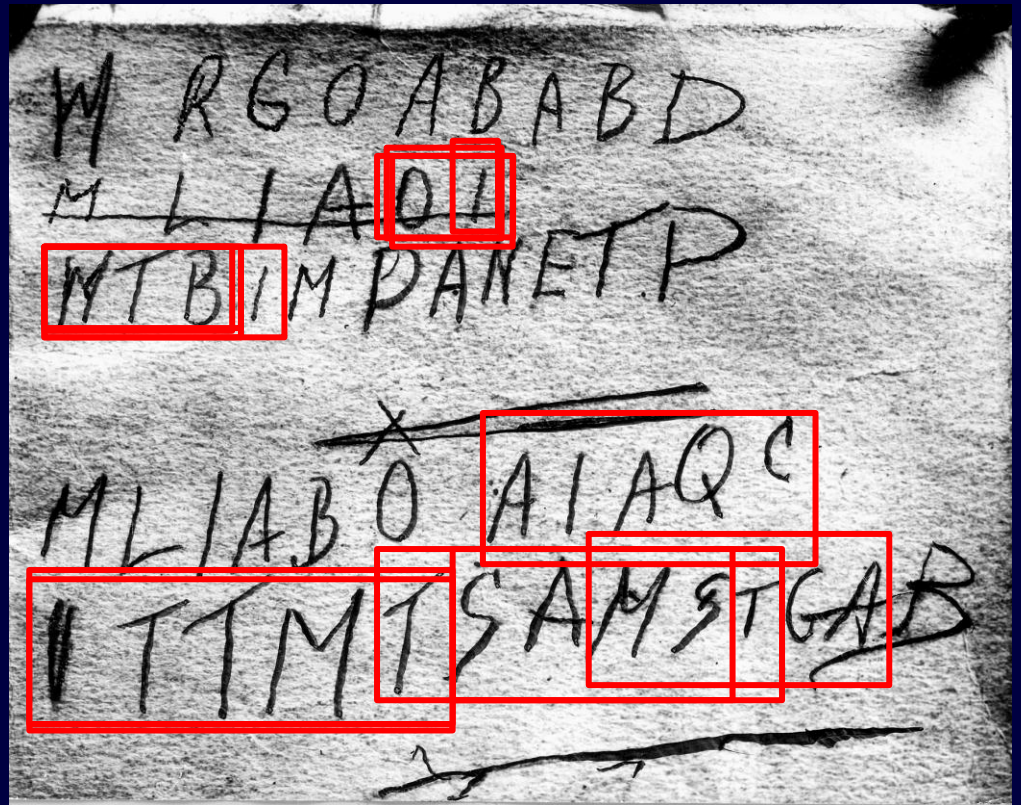
- Previous studies suggest code is an initialism
- Use of N-gram database increasing search speed
- Maximum 5-gram groups
- All variants of ambiguous letters
- Output most likely grams
- Repeated for lower grams (n=5-1)
- Large Data Set, limited processing power / time
- Processed using 'Amazon Elastic Compute Cloud'





Specific Tasks: Task 2: N-Gram Search Top Results

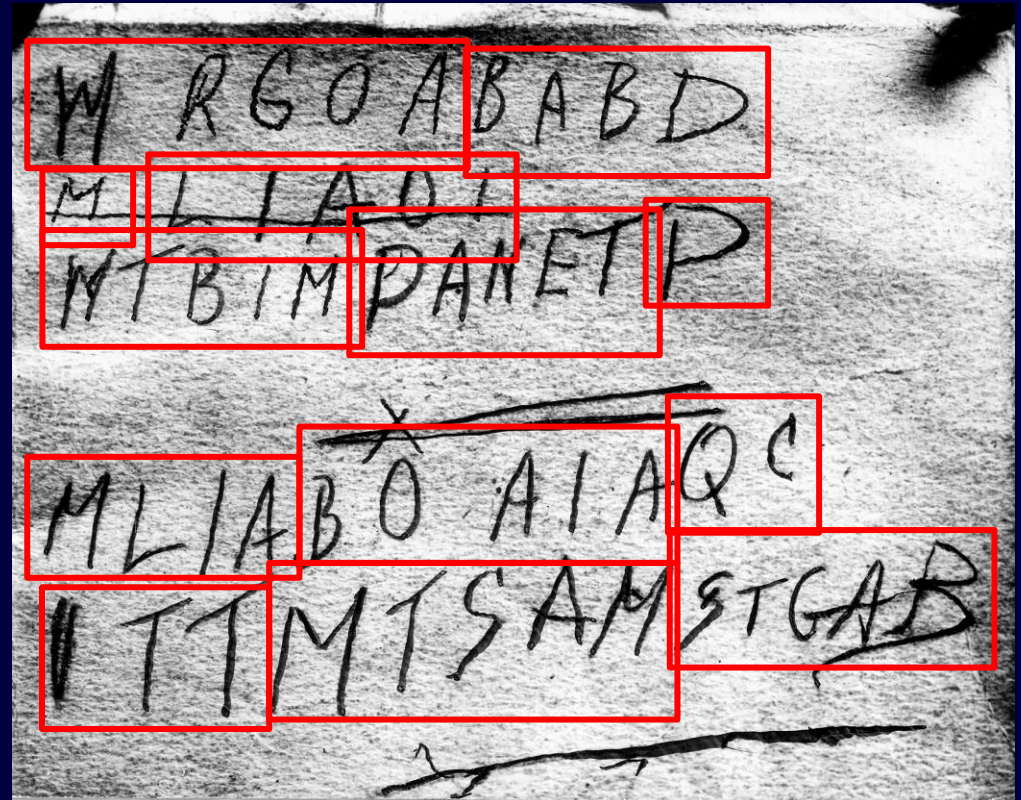
- that such a man should
- of it was to be
- Is this the man that
- it was to be in
- of it were to be
- so a man sharpeneth the
- I thought to myself that
- may serve to give a
- and I am quite convinced
- one is willing to be





Specific Tasks: Task 2: N-Gram Search Window Results

would rather go on as
but all by different mothers
late in August or in
was the best in my
processes are not easy to
people must live in a
be of an intensity akin
quite clear in the text
matter thus submitted as may
supposed to get a blood





Specific Tasks:

Task 3: Rubaiyat Omar Khayyam as One-Time Pad

Aim:

- Investigation that the letters have been substituted for others using a one-time pad technique using the code and the Rubaiyat as the pad.
- We are proposing to use different letter positions as keys to decode.
- We want to find some meaningful decoding messages by using this method.

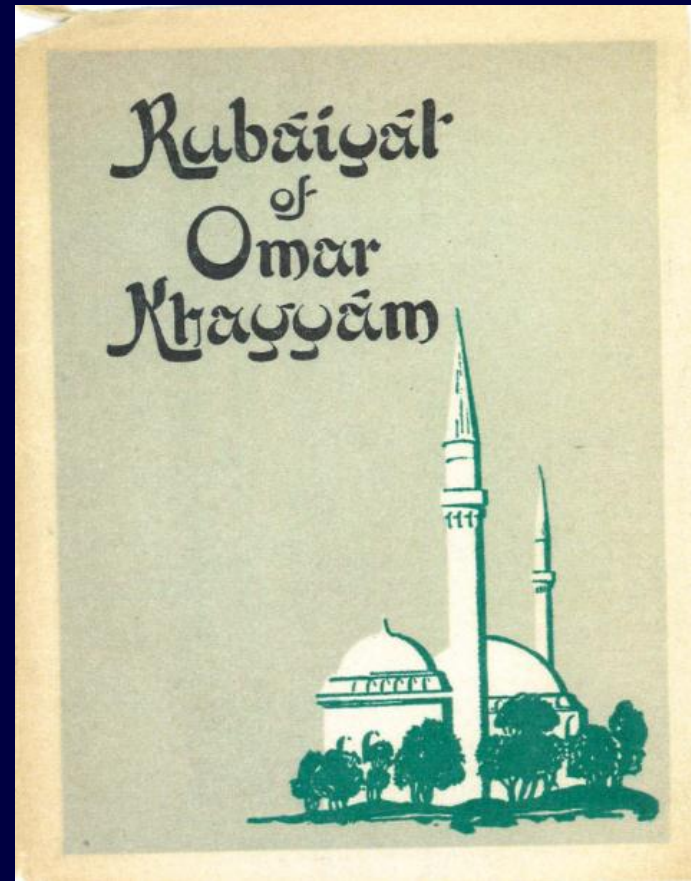


Figure 9. Derek Abbott's Wiki Project



Specific Tasks: Task 3: Rubaiyat Omar Khayyam as One-Time Pad

Method:

- Somerton Man Code acted as the cipher text, the *plaintext* of the code was desired to be deciphered using a *key* and the Rubaiyat of Omar Khayyam acted as the *one-time pad*.
- We used a computer program language called Matlab to implement the deciphering technique.
- Decoded using letter position within each word rather than using numbers assigned to each letter in the alphabet
- Also decoded using last letter of each word
- Verification using own encoded message





Specific Tasks:

Task 3: Rubaiyat Omar Khayyam as One-Time Pad

Quick example:

1. Assuming we have Code message **AFM** and we will use second letter to decode it.
2. The program will search the Rubaiyat from beginning to end, until it finds the first word that begin with **A**. This will then be decoded to the second letter in the same word which is **W**.
3. The program will repeat for rest letters in the Code.
4. The decoding message should be **WOO**.

```
AWAKE  
FOR  
MORNING  
IN  
THE  
BOWL  
OF  
NIGHT  
HAS  
FLUNG  
THE  
STONE  
THAT  
PUTS  
THE  
STARS  
TO
```

```
>> multi ('AFM', 2)  
Message:AFM  
Message:WOO
```





Specific Tasks: Task 3: Rubaiyat Omar Khayyam as One-Time Pad

**Decoding using second letter
(Rubaiyat without formatting)**

```
>> multi ('WRGOABABD', 2)
Message:WRGOABABD
Message:hoafnrnar
>> multi ('WIBIMPANEIP', 2)
Message:WIBIMPANEIP
Message:hhineonorhi
>> multi ('MLIABOAIQAC', 2)
Message:MLIABOAIQAC
Message:oorufnrrnua
>> multi ('IIIMISAMSIGAB', 2)
Message:IIIMISAMSIGAB
Message:rhhoaunaoaasa
```

**Decoding using third letter
(Rubaiyat without formatting)**

```
>> multi ('WRGOABABD', 3)
Message:WRGOABABD
Message:hoafnrnar
Message:esrh,hsls
>> multi ('WIBIMPANEIP', 3)
Message:WIBIMPANEIP
Message:hhineonorhi
Message:eartmtdtdie
>> multi ('MLIABOAIQAC', 3)
Message:MLIABOAIQAC
Message:oorufnrrnua
Message:r!adth,tdan
>> multi ('IIIMISAMSIGAB', 3)
Message:IIIMISAMSIGAB
Message:rhhoaunaoaasa
Message:aaenipdhvsrhh
```



Specific Tasks:

Task 3: Rubaiyat Omar Khayyam as One-Time Pad

Decoding using second letter (Rubaiyat with formatting)

```
>> multi ('WRGOABABD', 2)
Message:WRGOABABD
Message:HERNNYNUI
>> multi ('WIBIMPANETP', 2)
Message:WIBIMPANETP
Message:HHENAUNONHA
>> multi ('MLIABOAIQAC', 2)
Message:MLIABOAIQAC
Message:OONWEPNRLUO
>> multi ('IITMISAMSTIGAB', 2)
Message:IITMISAMSTIGAB
Message:NHHYHTNAOORLU
```

Decoding using third letter (Rubaiyat with formatting)

```
>> multi ('WRGOABABD', 3)
Message:WRGOABABD
Message:HERNNYNUI
Message:EIOECODIV
>> multi ('WIBIMPANETP', 3)
Message:WIBIMPANETP
Message:HHENAUNONHA
Message:EEFSYIDGOIR
>> multi ('MLIABOAIQAC', 3)
Message:MLIABOAIQAC
Message:OONWEPNRLUO
Message:RGSDFEDALAR
>> multi ('IITMISAMSTIGAB', 3)
Message:IITMISAMSTIGAB
Message:NHHYHTNAOORLU
Message:SEOYEUDNAKRHR
```



Specific Tasks:

Task 3: Rubaiyat Omar Khayyam as One-Time Pad

Last letter decoding (Rubaiyat without formatting)

```
>> multi ('WRGOABAED', 100)
Message:e,nfddAk!
>> multi ('WIBIMPANETP', 100)
Message:etdInperser
>> multi ('MLIABOAIQC', 100)
Message:g!I, en, mdle
>> multi ('ITIMTSAMSTGAB', 100)
Message:IneStgdhlins,
```

Last letter decoding (Rubaiyat with formatting)

```
>> multi ('WRGOABABD', 100)
Message:NNDETYDIE
>> multi ('WIBIMPANETP', 100)
Message:NEENYSADOWKE
>> multi ('MLIABOAIQC', 100)
Message:GONAENDMLLR
>> multi ('ITIMTSAMSTGAB', 100)
Message:NEEYEDDYLODLT
```





Specific Tasks:

Task 3: Rubaiyat Omar Khayyam as One-Time Pad

Verification:

Assuming we have origin message **GUN**, and use third letter to encode the message based on Rubaiyat. The encoded words from Rubaiyat should be **NIGHT**, **FLUNG** and **HUNTER**. The code should be **NFH**.

1	AWAKE	8	NIGHT	15	THE
2	FOR	9	HAS	16	STARS
3	MORNING	10	FLUNG	17	IO
4	IN	11	THE	18	FLIGHT
5	THE	12	STONE	19	AND
6	BOWL	13	THAT	20	LO
7	OF	14	PUTS	21	THE
8	NIGHT	15	THE	22	HUNTER

Result:

If we use **NFH** as code and choose third letter location as key, by using One-Time pad method. What is the output?

```
>> decoding ('NFH', 3)
```

```
ans =
```

```
Message:GUN
```





Specific Tasks:

Task 4: Statistical Frequency of Letters Reanalysis

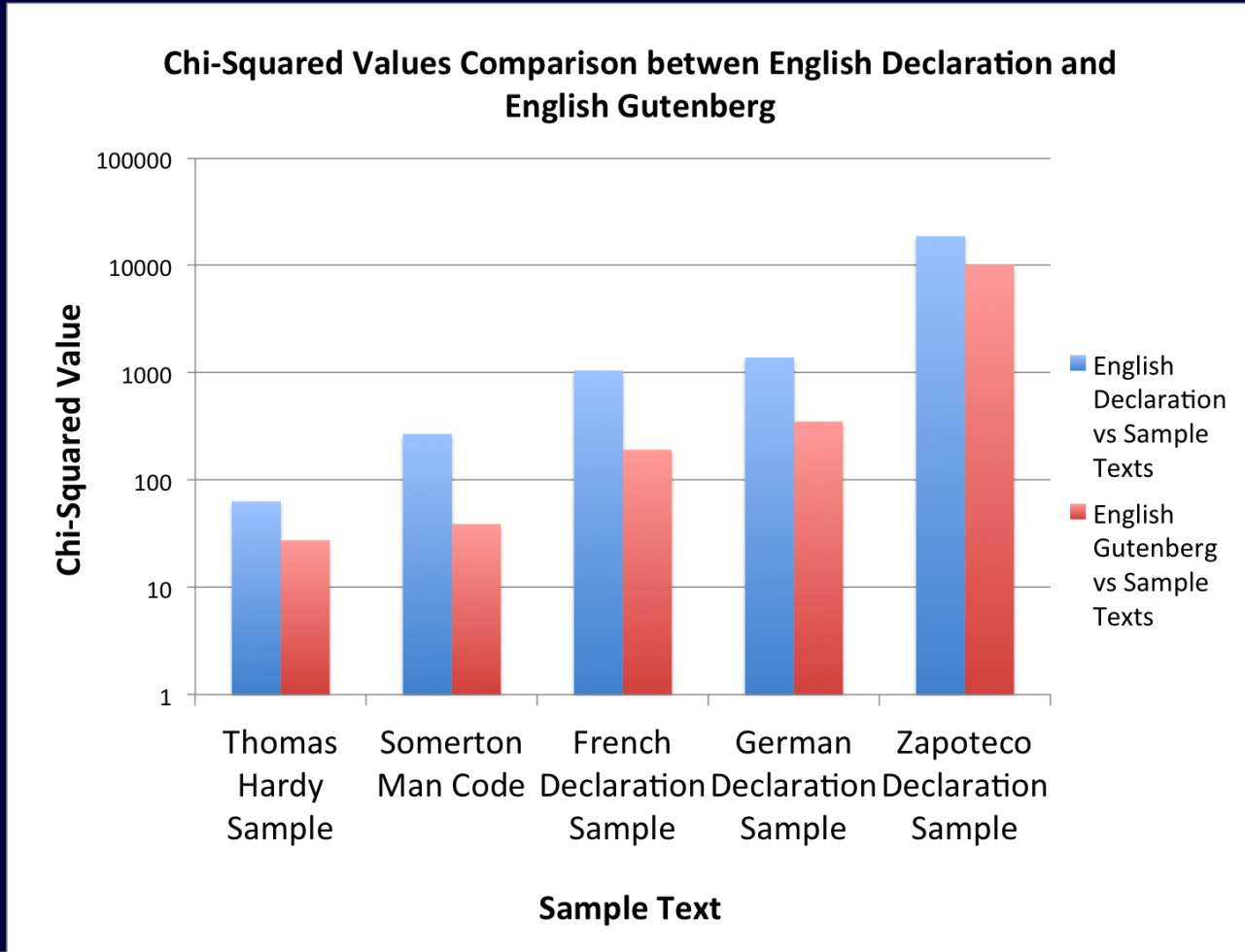
- Increased sample size to counteract letters with frequency 0
- Used Project Gutenberg Novels
- Utilised 2013 group's initial letter count and decoding toolkit
- Compared to initial results
- English P-value benchmark
- Hypothesis test:
 - H_0 : The group of letters are from the English language
 - H_1 : The group of letters are from another language





Specific Tasks:

Task 4: Statistical Frequency of Letters Reanalysis



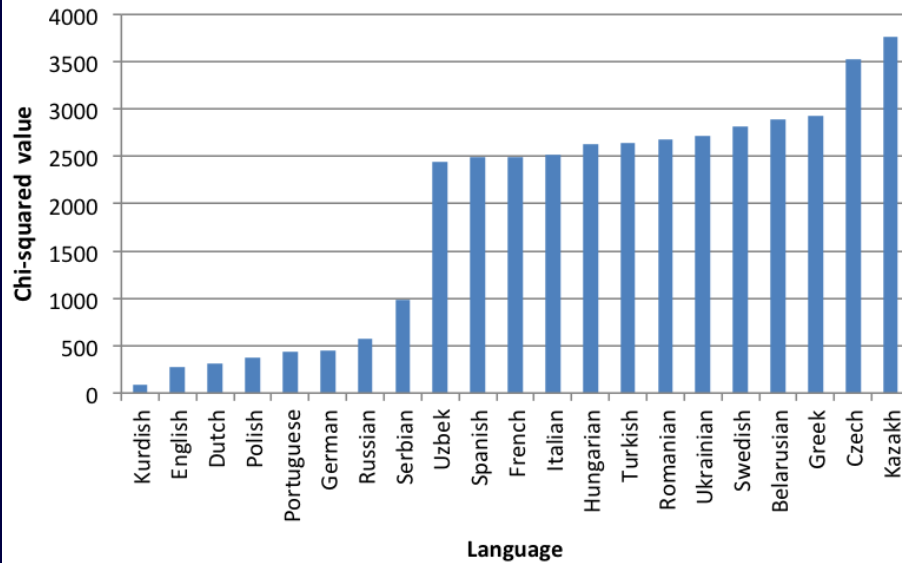


Specific Tasks:

Task 4: Statistical Frequency of Letters Reanalysis

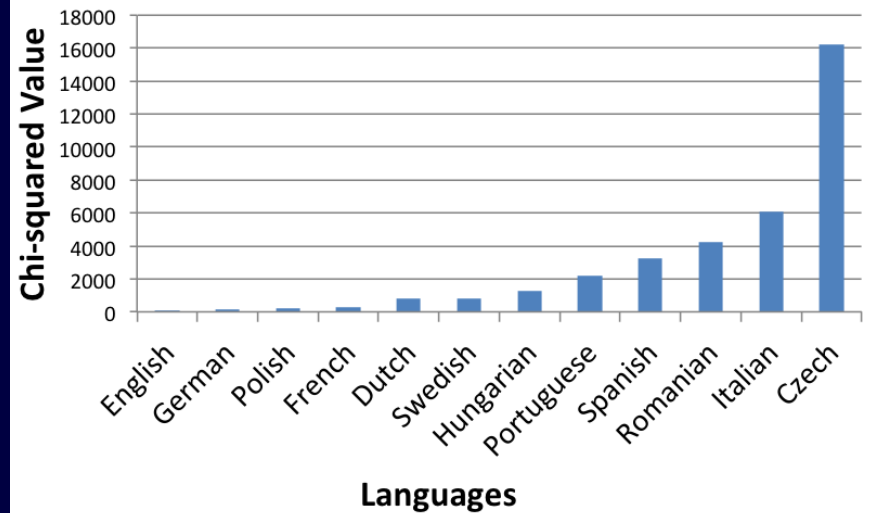
Initial analysis:

Code vs Declaration European Languages



Reanalysis:

Code vs Gutenberg European Languages

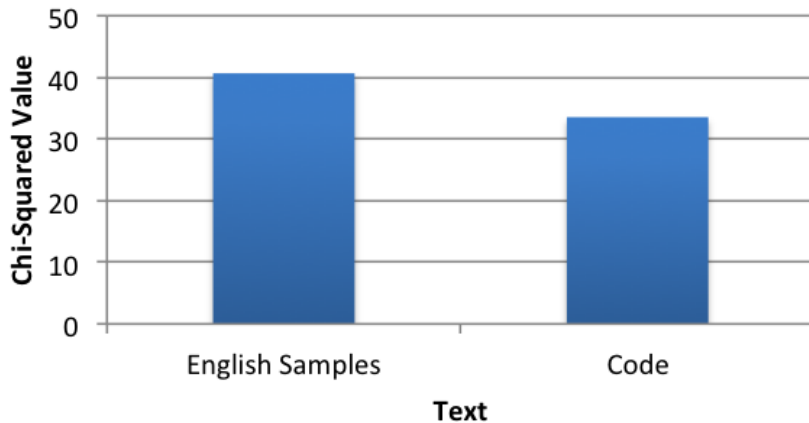




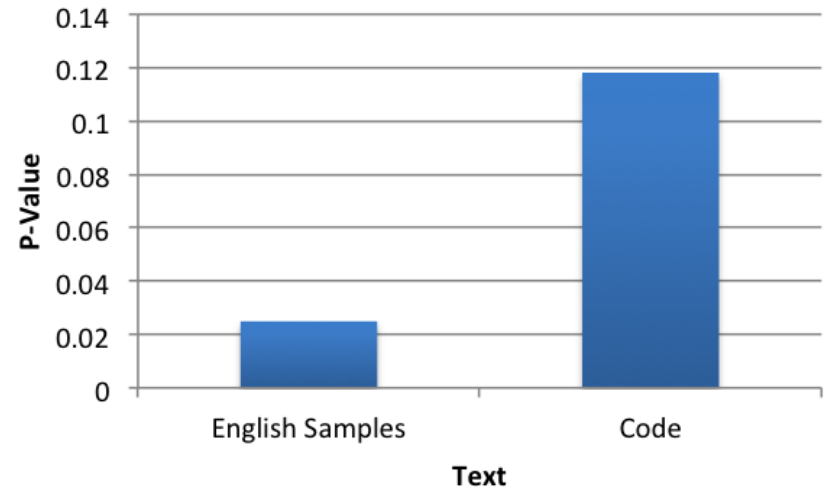
Specific Tasks:

Task 4: Statistical Frequency of Letters Reanalysis

Comparison of Chi-Squared Values of Code and English Samples against Gutenberg Base Text



Comparison of P-Values of Code and English Samples against Gutenberg Base Text





Project Management: Task Allocation

Task	Allocation
Proposal Seminar	Together
Draft Research Proposal	Together
Research Proposal and Progress Report	Individual
Project Management	Nicholas
Task 1: Statistical Frequency Analysis of Letters	Together
Task 2: N-Gram Search	Nicholas
Task 3: Rubaiyat of Omar Khayyam as One-Time Pad	Jikai
Task 4: Statistical Frequency of Letters Re-Analysis	Together
Exhibition Poster	Nicholas
Final Seminar	Together
Project Exhibition	Together
Honours Thesis/Final Report	Individual
Youtube Video	Jikai





Project Management: Budget

Proposed Budget

Item	Cost
Google N-Gram Database	\$150
Hard Drive	≈\$100
Total	≈\$250

Final Budget

Item	Cost
Google N-Gram Database	\$0
Amazon EC2 I2 Storage + Processing	\$576.01
Total	≈\$576.01





Project Management: Risk Assessment

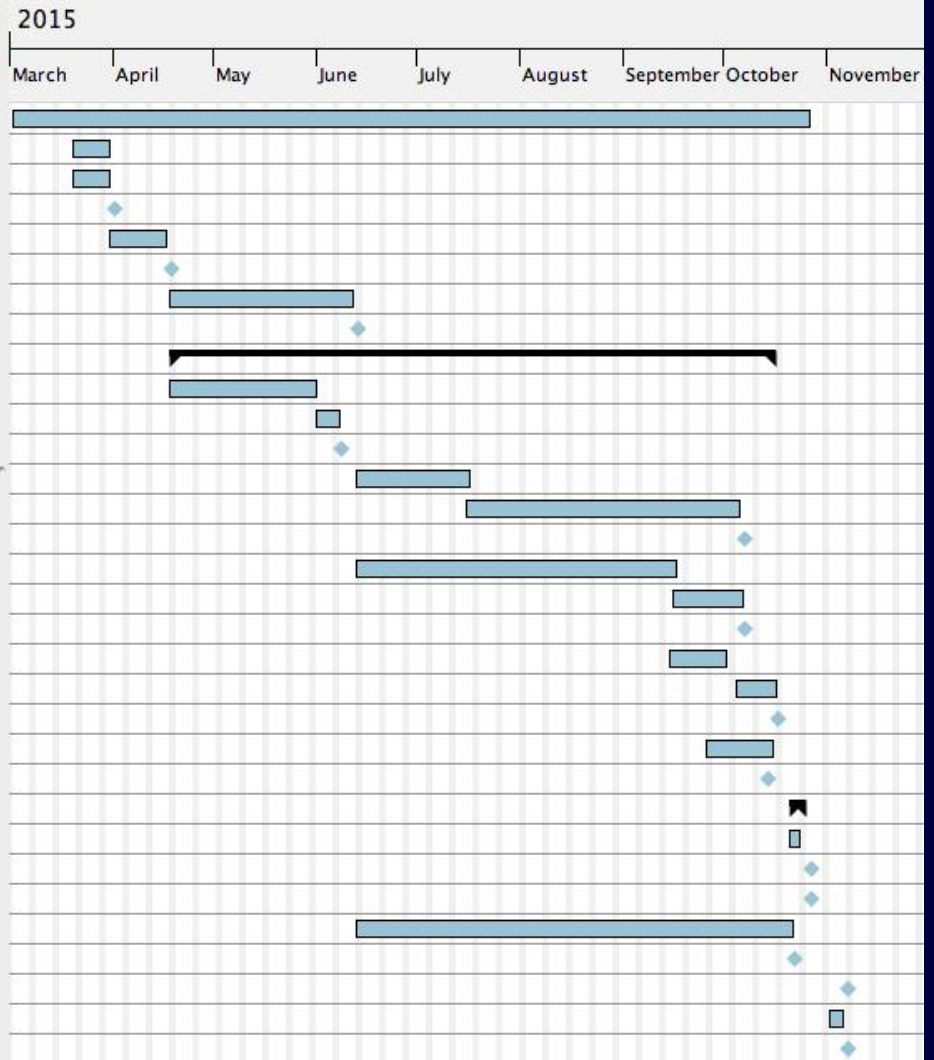
Risk	Likelihood	Severity	Risk Estimation	Reduction Strategy
1. Inaccurate estimation of time and resources	Likely	Moderate	High	Flexible Schedule
2. Member unable to complete work	Slight	Major	High	Assistance from other member and project supervisors
3. Member leaves group	Rare	Major	Medium	Encouragement and assistance when needed
4. Loss of data	Rare	Major	Medium	Regular backups
5. Illness/Absences	Unlikely	Minor	Low	Try to stay healthy and inform members as soon as possible
6. Group conflict	Unlikely	Minor	Low	Report to supervisor
7. Misunderstanding project tasks	Slight	Minor	Low	Schedule meeting with supervisors
8. Bugs in code	Likely	Moderate	High	Debugging and testing of code before completion
9. Inability to decipher the Somerton Man Code	Almost Certain	Negligible	Medium	Complete work to the best of the group's ability



Project Management: Final Gantt Chart



Name	Begin date	End date
◦ Weekly Progress	3/2/15	10/26/15
◦ Project Management Outputs	3/20/15	3/30/15
◦ Prepare Proposal Seminar	3/20/15	3/30/15
◦ Proposal Seminar Presentation	3/31/15	3/31/15
◦ Draft Research Proposal	3/31/15	4/16/15
◦ Draft Research Proposal Due	4/17/15	4/17/15
◦ Research Proposal and Progress Report	4/18/15	6/11/15
◦ Research Proposal and Progress Report Due	6/12/15	6/12/15
▼ ◦ Tasks:	4/18/15	10/16/15
◦ Task 1: Statistical Frequency Analysis of Letters	4/18/15	5/31/15
◦ Task 1 Verification	6/1/15	6/7/15
◦ Task 1 Complete	6/7/15	6/7/15
◦ Task 2: Web Crawler Re-design	6/13/15	7/16/15
◦ Task 2 Clean up and present results	7/16/15	10/5/15
◦ Task 2 Complete	10/6/15	10/6/15
◦ Task 3: Rubaiyat of Omar Khayyam as One-Time Pad	6/13/15	9/16/15
◦ Task 3 Test	9/16/15	10/6/15
◦ Task 3 Complete	10/6/15	10/6/15
◦ Task 4: Statistical Frequency of Letters Reanalysis	9/15/15	10/1/15
◦ Task 4 Verification	10/5/15	10/16/15
◦ Task 4 Complete	10/16/15	10/16/15
◦ Final Seminar Preparation	9/26/15	10/15/15
◦ Final Seminar Presentation	10/13/15	10/13/15
▼ ◦ Project Exhibition	10/21/15	10/25/15
◦ Exhibition Poster	10/21/15	10/23/15
◦ Exhibition Day	10/26/15	10/26/15
◦ Final Performance	10/26/15	10/26/15
◦ Final Report/Honours Thesis	6/13/15	10/21/15
◦ Final Report/Honours Thesis Due	10/21/15	10/21/15
◦ Dump of final work	11/6/15	11/6/15
◦ Create Youtube Video	11/2/15	11/5/15
◦ Submit Youtube Video	11/6/15	11/6/15





Project Management: Gantt Chart Milestones

Met:

- Proposal Seminar Presentation
- Submission of Draft Research Proposal
- Submission of Research Proposal and Progress Report
- Completion of Tasks 1-4
- Final Seminar Presentation

Upcoming:

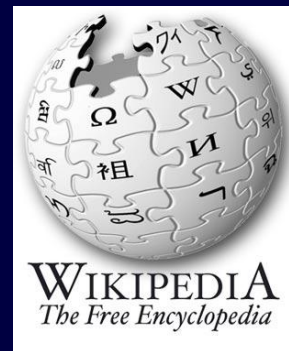
- Project Exhibition Poster
- Final Performance on Exhibition Day
- Submission of Final Report/Honours Thesis
- Dump of final work
- Creation of project Youtube Video





Project Management: Communication

- Regular face-to-face contact through meetings
- Regular communication via text message and email
- Use of collaborative software:
 - Google Drive
 - GitHub repository
- Project Wiki progress page





Relationship to possible career paths

- Techniques:
 - Software and programming skills
 - Information theory
 - Probability
 - Statistics
 - Encryption and decryption
 - Datamining
 - Database trawling
- Types of jobs:
 - Computer security
 - Communications
 - Digital forensics
 - Computational linguistics, eg. Used in Google Translate





Relationship to possible career paths

- Industries:
 - Software
 - E-finance
 - E-security
 - Telecommunications
 - Search engine
 - IT
- Job examples:
 - Google
 - ASIO
 - ASIS
 - ASD





Future Work

Our Group:

- Increase English base text letter frequency sample size
- Increase number of 44 letter English benchmarks
- Use to find more accurate significance level

Future Groups:

- Extend to all popular European Languages
- Focus on English and explore genre
- Explore more gram combinations by changing window size and shift
- Perform Mass Spectrometer Data Analysis





Conclusions

- Code not created using Rubaiyat of Omar Khayam as one-time pad and the proposed key method
- Further analysis of N-gram search results to provide valid or useful decryptions of the code
- English is most likely language from which the Somerton Man code was written assuming it is an initialism





Text References

- Author Unknown 1948, “Dead Man Found Lying on Somerton Beach,” *The News*, 1 December, p. 1.
- Author Unknown 1949, “Definite Clue in Somerton Mystery,” *The Advertiser*, 18 January, p. 1.
- “The Universal Declaration of Human Rights,” 1948, *United Nations*, viewed 28 March 2015, <<http://www.un.org/en/documents/udhr/>>.
- *Project Gutenberg*, Author Unknown 2015, viewed 12 October, available <<https://www.gutenberg.org>>
- *Project Gutenberg*, Author Unknown 2015, viewed 12 October, available <https://en.wikipedia.org/wiki/Project_Gutenberg>
- Duffy, A. & Stratfold, T. 2012, “Final Report 2012,” *Derek Abbott’s Wiki Project*, viewed 28 March 2015, <https://www.eleceng.adelaide.edu.au/personal/dabbott/wiki/index.php/Final_Report_2012>.
- Griffith, L. & Varsos, P. 2013, “Semester B Final Report 2013 – Cipher Cracking,” *Derek Abbott’s Wiki Project*, viewed 28 March 2015, <https://www.eleceng.adelaide.edu.au/personal/dabbott/wiki/index.php/Semester_B_Final_Report_2013_-_Cipher_cracking>.
- Maxwell, S. & Johnson, P. 2011, “Final Report 2011,” *Derek Abbott’s Wiki Project*, viewed 28 March 2015, <https://www.eleceng.adelaide.edu.au/personal/dabbott/wiki/index.php/Final_Report_2011>.
- Ramirez, K. & Lewis-Vassallo, M. 2010, “Final Report 2010,” *Derek Abbott’s Wiki Project*, viewed 28 March 2015, <https://www.eleceng.adelaide.edu.au/personal/dabbott/wiki/index.php/Final_Report_2010>.
- *Somerton Beach Mystery* 1978, YouTube, ABC, Sydney, viewed 28 March 2015, <<https://www.youtube.com/watch?v=ieczsZRQnu8>>.
- Turnbull A. & Bihari D. 2009, “Final Report 2009: Who killed the Somerton man?” *Derek Abbott’s Wiki Project*, viewed 28 March 2015, <https://www.eleceng.adelaide.edu.au/personal/dabbott/wiki/index.php/Final_report_2009:_Who_killed_the_Some>.



Image References

- Figures 1-4: Fettes, J 2013, 'Professor's 15-year search for answers seeks to crack the secret code to the death of the 'Somerton man' found on an Adelaide Beach', Herald Sun, viewed 28 March 2015, <<http://www.heraldsun.com.au/news/law-order/portrait-may-hold-key-to-somerton-man-beach-mystery/story-fni0ffnk-1226674957043>>.
- Figure 7: Universal Declaration of Human Rights 1948, *British Library*, viewed 28 March 2015, <<http://www.bl.uk/onlinegallery/takingliberties/staritems/645universaldeclarationhumanrightspic.html>>.
- Figure 8: Duffy, A. & Stratfold, T. 2012 "Final Report 2012," *Derek Abbott's Wiki Project*, viewed 28 March 2015, <https://www.eleceng.adelaide.edu.au/personal/dabbott/wiki/index.php/Final_Report_2012>.
- Figure 9: Rubaiyat Omar Khayyam n.d., *Derek Abbott's Wiki Project*, viewed 28 March 2015, <http://www.eleceng.adelaide.edu.au/personal/dabbott/tamanshud/W&T_rubaiyat_wells_copy.pdf>.





Questions





End of Presentation

