

Ciphers in Literature

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MATH5347: Cryptography

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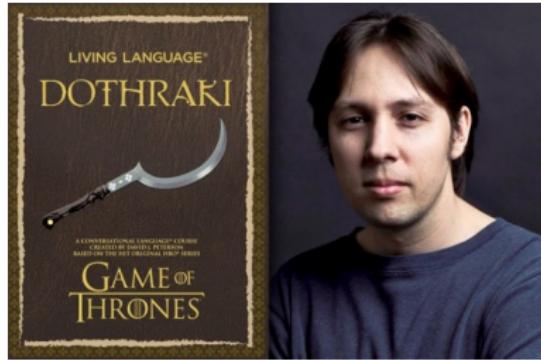
A brighter side to cryptography

- Cryptgraphy is the **art** of creating or solving codes
- We often associate this with espionage, warfare, privacy
- But it is an art... so today we will look at some of the less dreary applications of crypto in literature.

Popular entertainment examples of literary ciphers



Language as a cipher

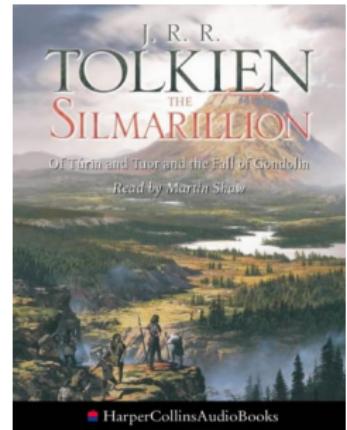
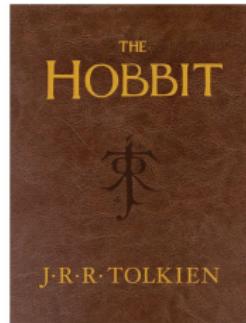
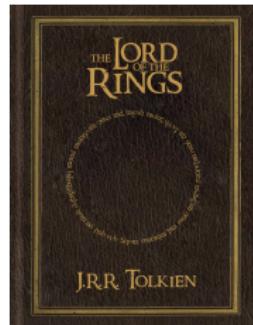


Worldbuilding

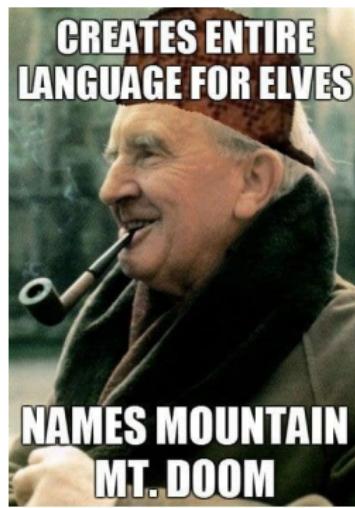
- Act of creating imaginary worlds
- Includes constructing culture, history, geography and language
- Languages can be created for imaginary races or alien species

J.R.R Tolkien's Middle Earth

- Tolkien created over 15 different languages
- Languages for the varied races in his fantasy elves, orcs, dwarves, ect
- What must follow once we have spoken language?



Nobody is perfect



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Cirith "Runes"

44

Language in Tolkien's Middle-earth

1	P	16	ZH**
2	R	b	17 nj - z - ks**
3	F	f	18 k
4	A	v	19 g
5	H	hw	20 kh
6	B	m	21 gh
7	J	(mh) mb	22 ng - n
8	N	t	23 kw
9	K	d	24 gw
10	I	th	25 khw
11	L	dh	26 ghw - w
12	T	n - r	27 ngw
13	C	ch	28 nw
14	K	j**	29 r - j - g**
15	A	sh	30 rh - zh - gh**

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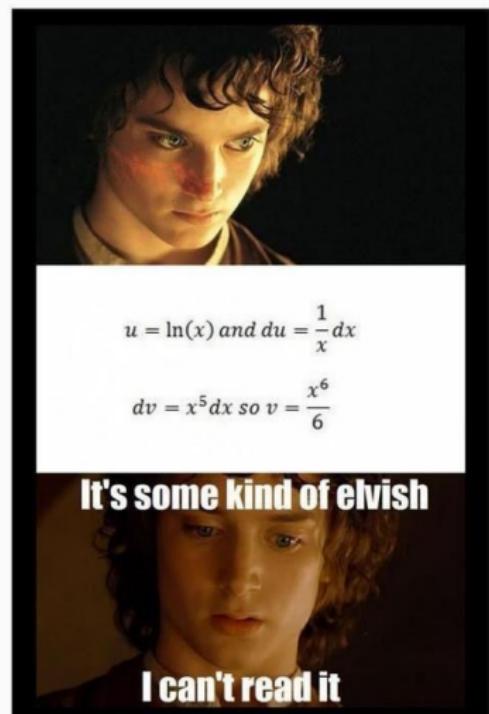
Runes and Letters

31	X	i	46	H	e
32	S	lh	47	H	ē
33	Y	ng - nd	48	N	a
34	>	s - h	49	H	ā
35	<	s - '	50	A	o
36	X	z - ng	51	M	Mō
37	W	ng*	52	A	Aō
38	W	nd - nj	53	Y	n*
39	I	i (y)	54	L	h - s
40	Y	y*	55	T	ə*
41	N	hy*	56	L	ə*
42	O	u	57	P	ps**
43	X	ū - z**	58	A	ts**
44	Φ	w	59	I	h
45	ꝝ	ü	60	L	&

Tengwar

Tengwar	
P	since "metal"
p̄	d/nd* ande "gate"
C	th ððus, ðnde "spirit"
c̄	dh ðða "mouth"
C	n ñamor "west"
C	r ore "heart"
ȝ	r̄ roven "east"
ȝ	s silent "starlight"
A	h hysqen "mother"

p	p	parrot ‘book’
p̪	b/m/b̪	wanab ‘face’
b	f	former ‘north’
b̪	v	sawpa ‘hook’
m	m	malua ‘gold’
w/v*	w/v	wala ‘angelic power’
v	r̪/th	ana ‘region’
v̪	s	nime nuperna ‘is reversed’
d	hw	hwanta zindorow ‘Gray-Elven hw’

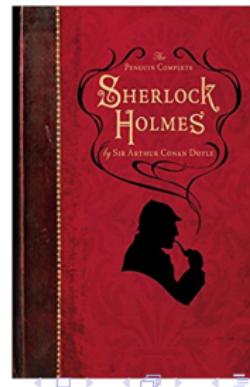
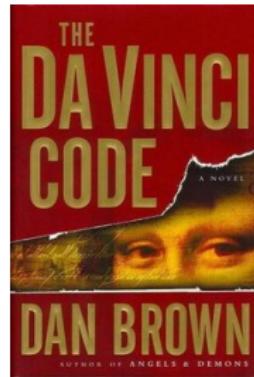


Fervor and Fandoms

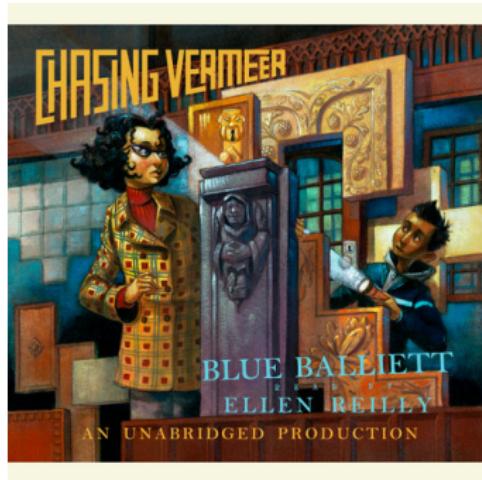


Ciphers as Puzzles

- Unique approach to audience engagement
- Wide variety of genre utilize ciphers
- Anything from word puzzles to secret messages the audience must decode



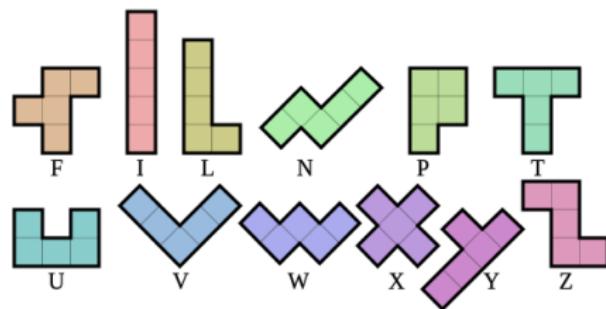
Chasing Vermeer



- 2003 Young Adult book by Blue Balliett
- Follows two middle schoolers, Calder and Petra, trying to solve the case of a stolen painting
- Uses puzzles within the text to engage the audience

Pentominoes

- Geometric shapes consisting of five squares that share at least one edge
- Each shape can be named after a letter of the alphabet
- Calder uses pentominoes in the story uses them in his cipher



Vermeer Cipher

- Calder uses a simple substitution cipher throughout the book
- Each letter is assigned a pentomino and a number
- Codes are left unsolved for the reader

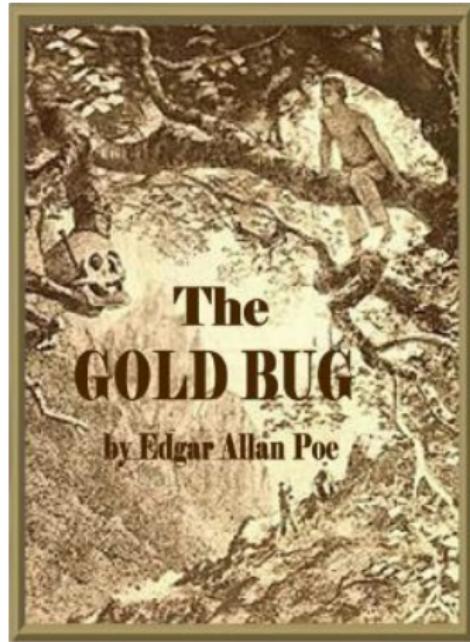
	1	2	3
F	A	M	Y
I	B	N	Z
L	C	O	
N	D	P	
P	E	Q	
T	F	R	
U	G	S	
V	H	T	
W	I	U	
X	J	V	
Y	K	W	
Z	L	X	

Vermeer Codes

L:1 F:1 Z:1 N:1 P:1 T:2,
T:1 T:2 P:q N:1 - F:2 L:2 X:2 P:1 N:1 - L:2 W:2 V:2 - Y:2
P:1 - Y:2 F:1 I:2 V:2 - V:2 L:2 L:1 L:2 F:2 P:1 - V:1 L:2 F:2
P:1. - I: W:2 V:2 - I:2 L:2 - F:2 L:2 I:2 P:1 F:3 -
V:2 L:2 F:2 F:2 F:3

*Calder, Fred moved out we want to come home. But no money,
Tommy*

The Gold-Bug



- The GoldBug is a short story written by Edgar Allan Poe
- Involves a detailed description of how to break a substitution cipher
- Main character describes the process of using letter frequency to crack a code

The GoldCode

53305))6*; 4826)4.)4); 806*; 48860))85; ;]8*; :
* 883(88)5 * ; 46(; 88 * 96*?; 8) * (; 485); 5 * 2 :
*(; 4956 * 2(5 * |4)88*; 4069285);)68)4; 1(9; 48081; 8 :
81; 4885; 4)485528806 * 81(9; 48; (88; 4(?34; 48)4; 161; : 188; ?;

“Of the character 8 there are 33
; there are 26.
4 there are 19.
†) there are 16.
* there are 13.
5 there are 12.
6 there are 11.”

Conclusion

- Ciphers find their way into fiction in a variety of ways
- Puzzles for readers or languages of a fictional land
- Major contributing factor to the success of these works
- Will not be forgotten soon

Questions

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