



Information and Communication Technology:

The INFORMATION THEORY (an INTRODUCTION)

The INFORMATION THEORY



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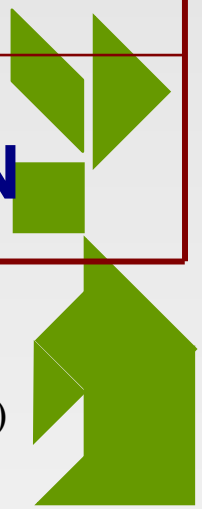
rhiza@unhas.ac.id <http://www.unhas.ac.id/~rhiza/>



Yet, another extended meaning of
INFORMATION

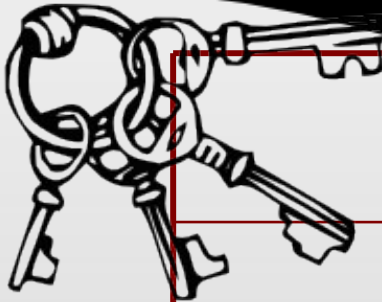
The UNIT of INFORMATION

The UNIT of INFORMATION



(Source: Everett M. Rogers, [**1986**], “ *Communication Technology*”, page. 13)

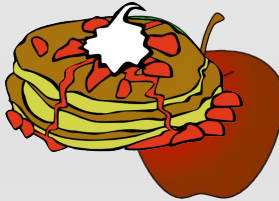
Key element/basic resource



Key element

UNIT

FOOD



kg, lbs, liter, oz



ENERGY

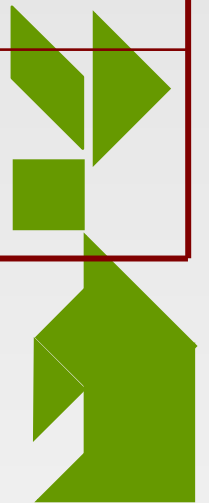


kWh, Joule,barrel

INFORMATION



????????



The **SMALLEST UNIT** of **INFORMATION**



will you marry me...???

The **SIMPLEST FORM** of
INFORMATION

YES	NO
RIGHT	WRONG
TRUE	FALSE
ON	OFF
WHITE	BLACK
TURN ON	SHUT DOWN
YES	NO
1	0

1 0

1 BIT
(Binary digit)



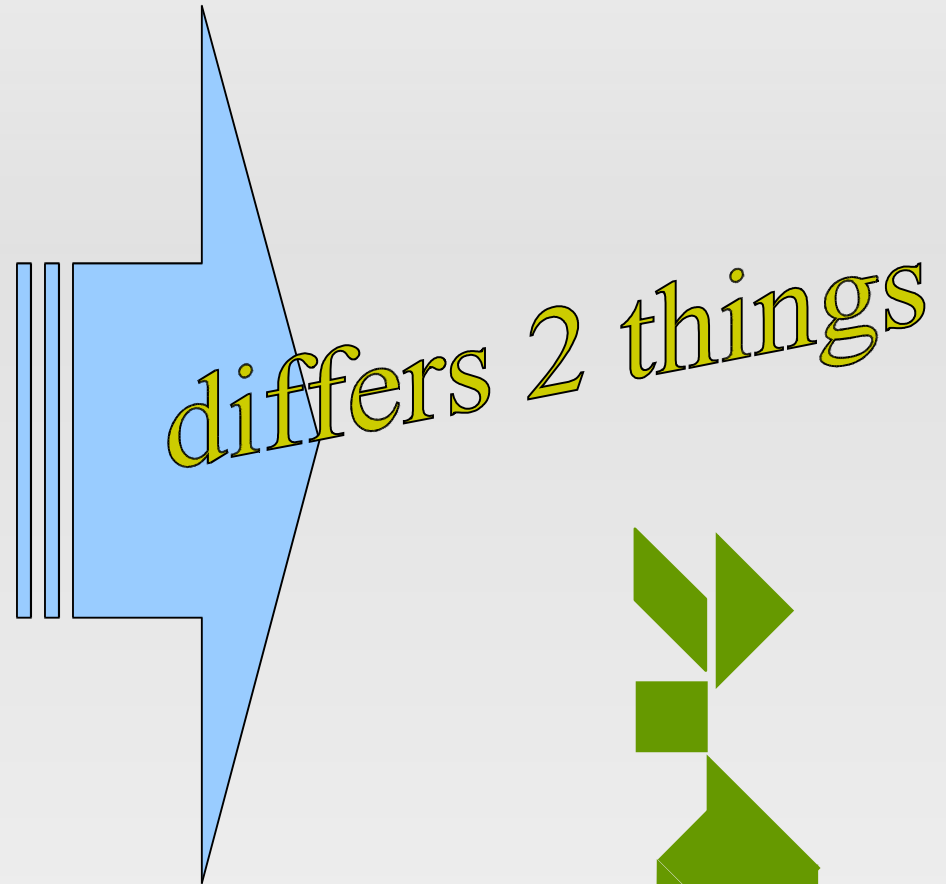
The *VALUE* of an *INFORMATION*



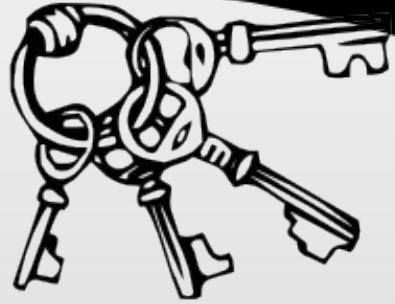
1 BIT =

YA	TIDAK
BENAR	SALAH
TRUE	FALSE
ON	OFF
HITAM	PUTIH
NYALA	PADAM
YES	NO

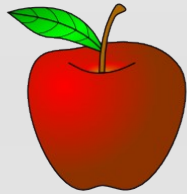
1 0



The *VALUE* of an *INFORMATION*



2 BITS =
could differ 4 things



→ 00



→ 01



→ 10

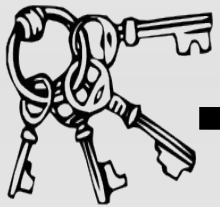


→ 11

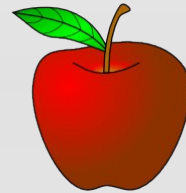


The *VALUE* of an *INFORMATION*

3 BITS ⁼ could differ up to 8 things



→ 000



→ 100



→ 001



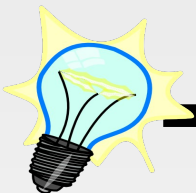
→ 101



→ 010



→ 110



→ 011



→ 111

The *VALUE* of an *INFORMATION*

n BITS =

could differ up to 2^n things:

0000

0100

1000

1100

0001

0101

1001

1101

0010

0110

1010

1110

0011

0111

1011

1111

The *VALUE* of an *INFORMATION*



ASCII Code =

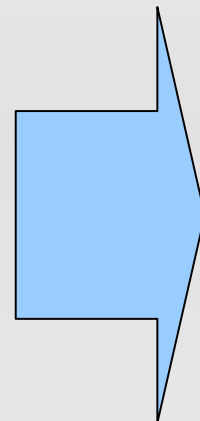
American Standard Code for Information Interchange

a b c d e x y z

A B C D E F G H

0 1 2 3 4 5 6 7 8 9
~ ! @ # \$ % ^ & * () _ - + = \ } { [" ' : ; ? / . <

All kinds of "character"



8 BIT codes

from

00000000

up to

11111111

examples

H = 01001000

a = 01100001

\ = 01011100

b = 01100010

h = 01101000

Z = 01011010

The *VALUE* of an *INFORMATION*

For example.....

How much information is in a 275-page book ????

How many characters???

550.000

X

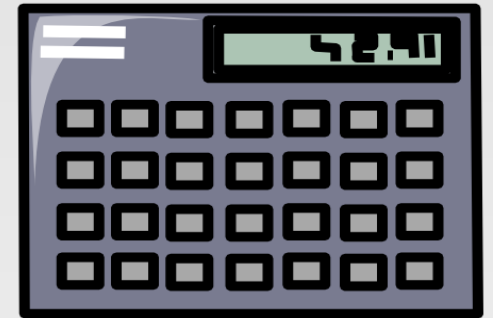
8 BIT

275 pages

X 40 lines/page in average

X 10 words/line in average

X 5 characters/word in average



4.400.000
BIT

Larger units of INFORMATION



1000 bit → 1 Kilobit → 1 Kb

1000 Kb → 1 Megabit → 1 Mb

1000 Mb → 1 Gigabit → 1 Gb

1000 Gb → 1 Terrabit → 1 Tb

1 Byte → 1 B = 8 s/d 10 bit

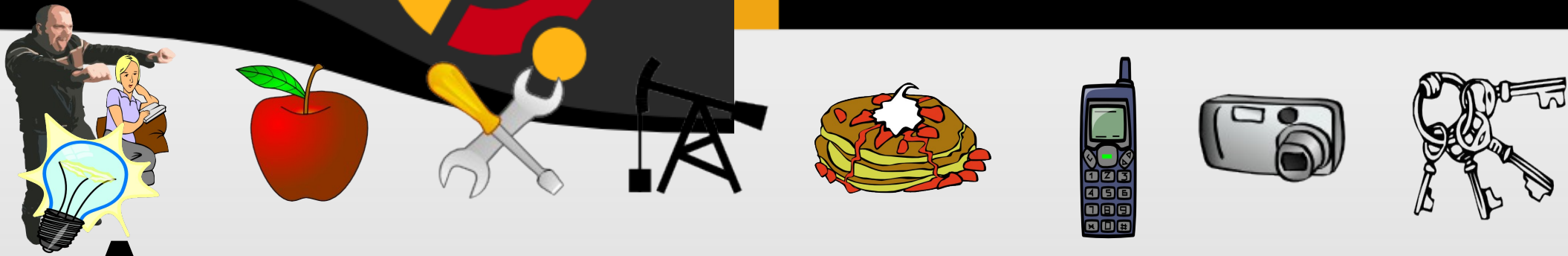
Larger units of INFORMATION



Example:

A flashdisk has a capacity of 8 Gb. How many e-books of 5.5 Mb can be stored in the flashdisk?

Larger units of INFORMATION



Answer:

The flashdisk has the capacity of 8 Gb = 8000 Mb. The e-book's "size" is 5.5 Mb. Thus, the flashdisk can be filled up to $8000/5.5$ e-books, or around 1455 e-books ! (Compare to your bag, how many books can you store in it??? 5, 6, 10 books?)



NEXT

The Information Theory

..... to be continued

