Introduction to Digital Humanities Research & Computing

Fall Semester 2015

Week 4

Discussion

NCSE.ac.uk

Part 1 - Computing Power

- mechanical work with horsepower & watt

- measuring the power of a computing machine

1. How much information it can process?
2. How fast can it process?
3. Efficiency

How much information it can process?

- informally we use information to mean knowledge
- primary unit of information is a 'bit'
- what is a binary question?
- tossing a coin

<u>Binary questions</u>

- goal is to identify questions where the "yes" and "no" answers are equally likely

- 2 more bits would allow us to distinguish between 4 possible outcomes

- questions are discrete, so we round up
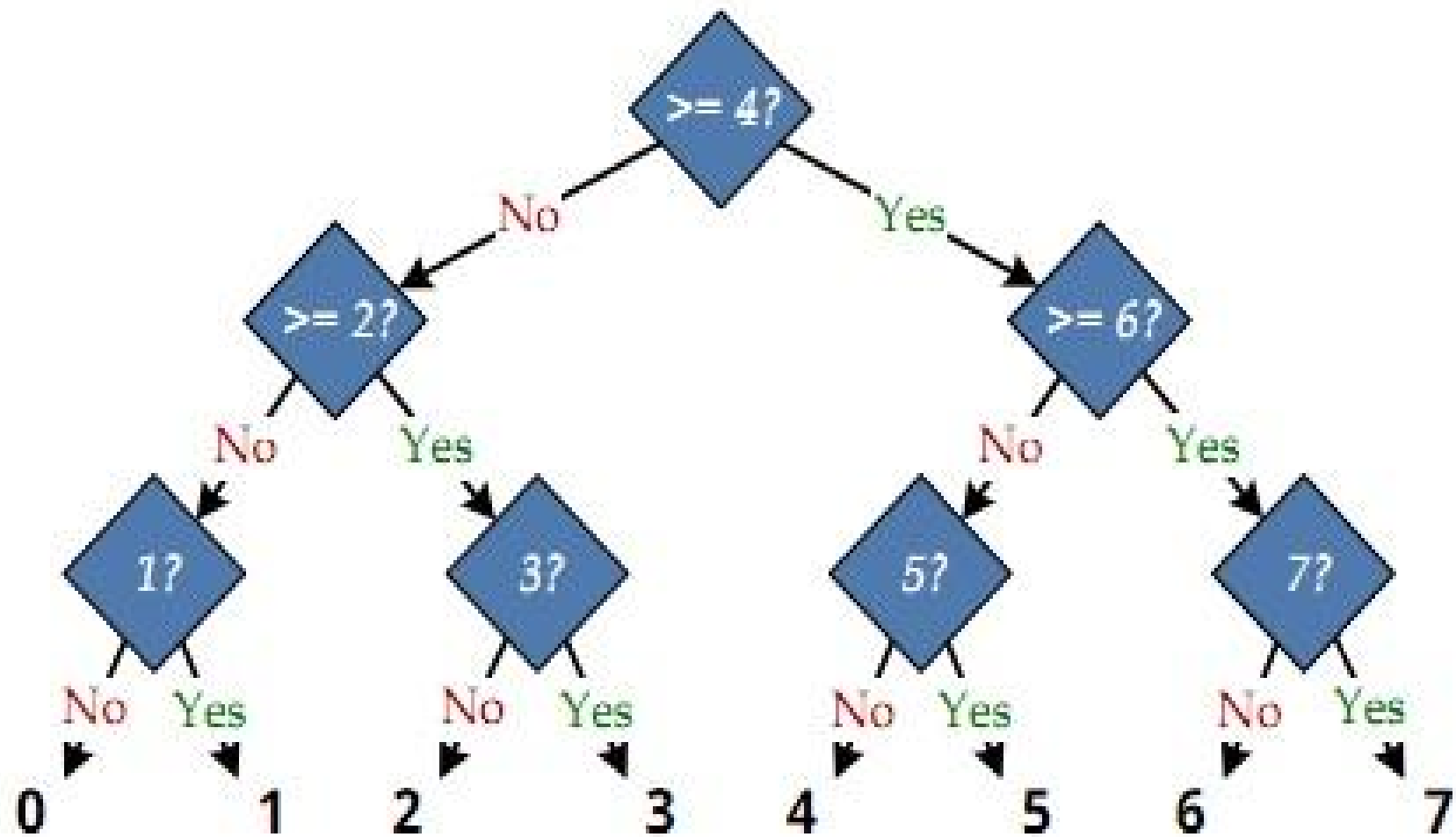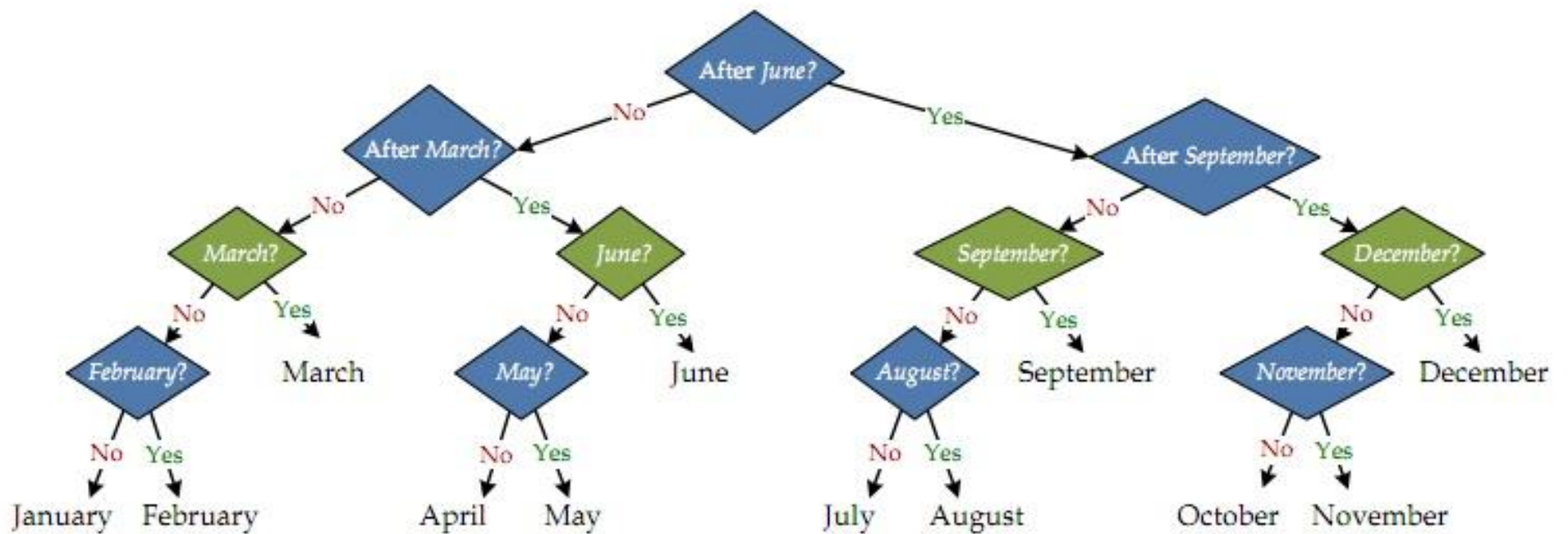
How a computer sees text and images

Text

- enumerate all texts alphabetically by length

a, b, c, . . ., z, aa, ab, . . ., az, ba, . . ., zz, aaa, . .

- for example, we could work with 57 different symbols from the English language
    - 26 lower-case
    - 26 upper-case
    - space, comma, period, new line, semi-colon

a	000000
b	000001
c	000010
d	000011
...	...
p	001111
q	010000
...	...
z	011001

A	011010
B	011011
C	011100
...	...
F	011111
G	100000
...	...
Y	110010
Z	110011

space	110100
,	110101
.	110110
newline	110111
;	111000
unused	111001
...	...
unused	111110
unused	111111

- [raw editing of a text](#)

How a computer sees text and images

Images

- eg: a black and white picture

-

```
0000011111100000
0000100000010000
0011000000001100
0010000000000100
        . . .
0000011111100000
```
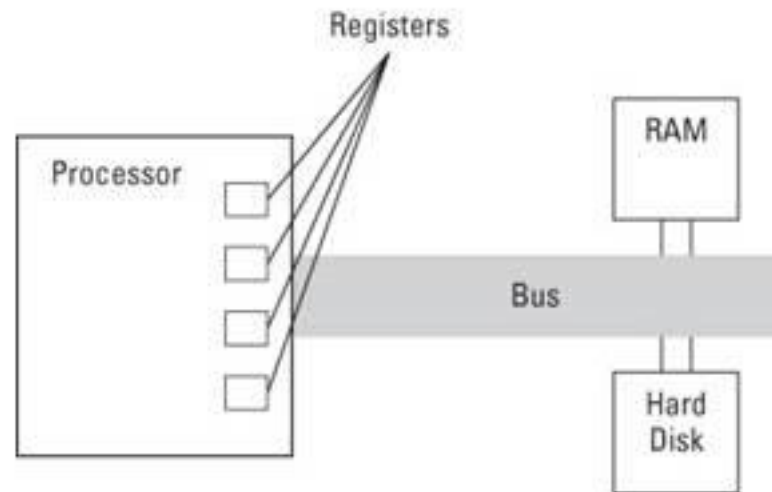
Part 2 - Languages and Programming

- Examine various levels of computer programming

- processors and machine language

1011 0000 0110 0001

- tedious and rarely used

Assembly language

- makes programming easier than machine language
- by itself, a processor is pretty useless for computational work
- communication through a 'bus'
- temporary storage in the 'register'

Assembly language

- example of assembly language

      sub al, 061h

- still overly complicated and not suited to large application development

- even for small programs you still need to manipulate the registers

- add two numbers together with assembly language

High level languages

- aim was to make programming more intuitive

- create a layer of abstraction

- 'Hello World'

Java 'Hello World'

```java
class helloworld
{
        public static void main(String args[])
        {
          System.out.println("Hello World!");
        }
}
```

PHP 'Hello World'

```php
<?php

echo "Hello World, how are you?";

?>
```

[PHP Hello World Output](#)

Compilers

- high level language into machine language

- translate using a compiler

- trade-offs from high level to machine language

Hypermediacy

- aware of the medium or media
  - sometimes subtle and sometimes obvious ways

"In every manifestation, hypermediacy makes us aware of the medium or media and (in sometimes subtle and sometimes obvious ways) reminds us of our desire for immediacy."

Bolter, J, and Grusin, R. 1999. "Remediation. Understanding New Media." Cambridge Massachusetts: MIT Press.

IMMEDIACY	HYPERMEDIACY
Window through	Window At
Epistemologically: knowledge rests upon transparency	Epistemologically: knowledge rests upon opacity
Psychologically: viewer feels that the medium has been erased	Psychologically: viewer has the impression that the medium has not been erased, on the contrary
Reality (as presented through the window of the medium) is reached and experienced as authentic	'Experience of the medium is itself an experience of the real' and authentic
Unified perspective, suggestive of normative linear view	Multiplies media and fragments viewer's perspective, suggestive of deviancy and revolt to the normative and linear
The focused gaze	The shifting glance
E.g. (where possible) virtual reality experience of flying, such as a pilot training simulator	E.g. TV news reports

Perceptions of self

- mobile self based upon immediacy and potentially made possible by virtual reality experiences

- networked self based upon hypermediacy experiences

"real and material in effect, not in fact"

Heim, Michael. 1993. "The Essence of VR" in The Metaphpysics of Virtual Reality. Oxford University Press. PP. 109-128.