

School of Computing and Information Systems
The University of Melbourne
COMP90049 Knowledge Technologies (Semester 2, 2019)
Workshop exercises: Week 2

1. Observe from the lecture slides that we have definitions (of sorts) for **data** and **information**, but no explicit definition of **knowledge** is given. Revise the definitions of the two terms above, and choose salient points of the lecture to define **knowledge** (perhaps in terms of the other two concepts).
2. What do we mean when we say **knowledge technologies**?
 - (a) Revise the definition of **knowledge tasks**, with respect to **concrete tasks**.
 - (b) Consider the following, and decide into which category you believe they fall, referring to the definition you have decided upon above.
 - i. Multiplying two floating-point numbers in base 16
 - ii. Playing a competitive game of naughts-and-crosses
 - iii. Playing a competitive game of go
 - iv. Playing a competitive game of tennis
 - v. Calculating the trajectory of a thrown book
 - vi. Selecting appropriate counter-measures after someone has thrown a book at you
 - vii. Selecting a book that a given person will enjoy reading
 - viii. Translating a program written in C into Java
 - ix. Translating a document written in Japanese into English
3. What are **structured data** and **unstructured data**? Give an example of each, and indicate how you would handle each in a computational setting.
What about **semi-structured data**? Are any of the examples you gave above actually instances of semi-structured data? In what ways is it easier or more challenging to handle semi-structured data?
4. Describe a process through which we might be able to answer the question “Where shall we go for dinner tonight?” using Google (<http://www.google.com>) as a resource.
(We’ll touch on some of these elements as the semester goes on.)
5. Revise the following **regular expression** operators:

() [] { } . * + ? ^ \$ | \

For each of the following, give a couple of examples of strings which the regular expression would match. Describe (colloquially, in a manner that a non-technical person would understand) the set of strings that the pattern is designed to match.

- (a) `/[a-zA-Z]+/`
 - (b) `/^[A-Za-z][a-z]*$/`
 - (c) `/p[aeiou]{,2}t/`
 - (d) `/\s(\w+)\s1/`
6. Write a regular expression to solve the following problems:
- (a) Match a price
 - (b) Match an Australian telephone number
 - (c) Remove HTML comments from a document
 - (d) Validate an email address