CITS4401 Software Requirements and Design
Semester 1, 2020
Workshop week 10 – Architecture

Assessed task

This is to be completed individually.

For each of the following systems, suggest an appropriate architecture. Give dot-point reasons in favour of the architecture you have suggested.

1. Video conversion software. The system is a command-line application, able to read in video files in various formats (e.g. `.avi`, `.mp4`). It can then splits the audio and video into separate streams, and can perform various "transformations" on each. For instance, the video might be *scaled* larger or smaller, or *cropped* (bits are taken off the sides); the audio might have its volume increased or decreased.

   The system then joins the transformed video and audio tracks together, and outputs them in a format specified by the user.

2. Protein-folding simulation. The software is intended to predict the ways that *proteins* will fold. Proteins are molecules consisting of long chains of atoms, some of which attract or repel each other, or attract and repel the medium the protein is surrounded by (for instance, water). When left to its own devices, the different parts of the protein will rapidly "fold up" into a particular configuration, determined by the exact atoms which make up the protein.

   In this case, we do not know any *algorithm* that tells us how a protein will fold. However, we *do* know how to design many components that know how to solve *part* of the problem: each component can recognise when some sequence of atoms is of a sort that it "knows" how to handle, and can contribute a solution.

Submit your answers via `cssubmit` (the submission will become active after the workshop).

Assessment details and guidelines

- The standard workshop rubric for CITS4401 will be used for marking.
- Submit your *introduction* and *pattern* to cssubmit by 8pm Wednesday 13 May 2020.
- Please submit a single PDF. You may scan a hand written document, as long as your writing is clear.

- Font size should be between 9 and 12 point.
- Any diagrams must be large enough to be clearly legible when read.