TOPICS IN ALGEBRAIC LOGIC AND DUALITY THEORY
SEMINAR SHEET 4

- The contents of this seminar sheet will be discussed on **June 14**;
- Pick one or more examples to work out in full detail; you do not need to work on all of the examples.
- Examples are roughly ordered by conceptual difficulty, relative to the material covered in lectures.

(1) **(Logics of bounded depth or width)**
   (a) Show that a frame validates bd_n iff it doesn't contain a chain of $n + 1$ points.
   (b) Show that a frame validates bw_n iff none of its rooted subframes contain an antichain of $n + 1$ points.
   (c) Show that $\mathsf{BDW}_2 = \mathsf{IPC} + \mathsf{bd}_2 + \mathsf{bw}_2$ is the logic of the 2-fork.

(2) **(Axiomatization and semantics of seven superintuitionistic logics)** Show all the equalities on slide 2.

(3) **(Interpolation of seven superintuitionistic logics)** Show the easy direction of Maksimova's characterisation. That is, show that the logics CPC, LC_2, LC, KC, BD_2, BDW_2 and IPC have interpolation.

(4) **(Gaps in the slides)** Prove the exercises from the slides.