Dcpo – completion of posets

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We construct a dcpo D(P) for each poset. The main results include :
(a) There is a Scott continuous mapping $\eta_P : P \to D(P)$ which is universal among such mappings, thus proving that the full subcategory DCPO of dcpos is reflexive in the category POS_d of posets and Scott continuous mappings;

(b) P is a continuous poset if and only if D(P) is a continuous dcpo;

(c) The Scott closed set lattice $\sigma^{op}(P)$ of P and $\sigma^{op}(D(P))$ of D(P) are isomorphic. This shows that the class of Scott closed set lattices of all posets are the same as the class of Scott closed set lattices of all dcpos;

(d) Using this construction, we give a revised version of bounded dcpo completion of posets originally constructed by Mislove.

This is a cooperate work with Fan Taihe.