Algebraic geometry 1
Exercise sheet 5

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Exercise 1. We make a pushout of the diagram $U_1 \leftarrow V_1 \rightarrow U_2$, where $V_1 \rightarrow U_1$ is the inclusion and $V_1 \rightarrow U_2$ and composition of φ and inclusion.

Let X be the pushout in terms of topological spaces and let $\alpha_1 \colon U_1 \rightarrow X$ and $\alpha_2 \colon U_2 \rightarrow X$ be the associated morphisms.

We define a sheaf $\mathcal{O}_X$ in the following way. Take an open subset $Z \subseteq X$. Then $Z \cap \alpha_1(U_1) = Z_1$ and $Z \cap \alpha_2(U_2) = Z_2$ are an open cover of Z in X. Then let