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Visualization of the structure of four-dimensional Archimedean polytopes

Abstract. A four-dimensional uniform polytope (having common symmetry group with a regular polytope) is said to be Archimedean if its cells are three-dimensional Archimedean polyhedra. We will see a possible constructing method of these polytopes from the regular ones by appropriate scaling operations acting on their edges, faces and cells. However, a complete two-dimensional projection usually does not have enough information about the incidence structure. Thus, we will examine only a small part of the three-dimensional surface around the vertices of a characteristic simplex of the original regular polytope. In this way we can recognise the type of cells, the number of congruent cells, faces, edges and vertices. Finally, we can classify the derived polytopes.