Programming Exercise 7: Solid modeling

Introduction

In this exercise, you will implement two solid modeling method: Extruding(拉伸) and Sweeping. Before starting on this programming exercise, we strongly recommend watching the lectures.

Task 1: Extruding solid modeling

The input for extruding operation will include a profile curve and a extruding path. see figure 1,the profile is generally a closed planar curve such as circle, a polygon, or a Bezier curve. The extruding path could be a simple vector or even a curve path.

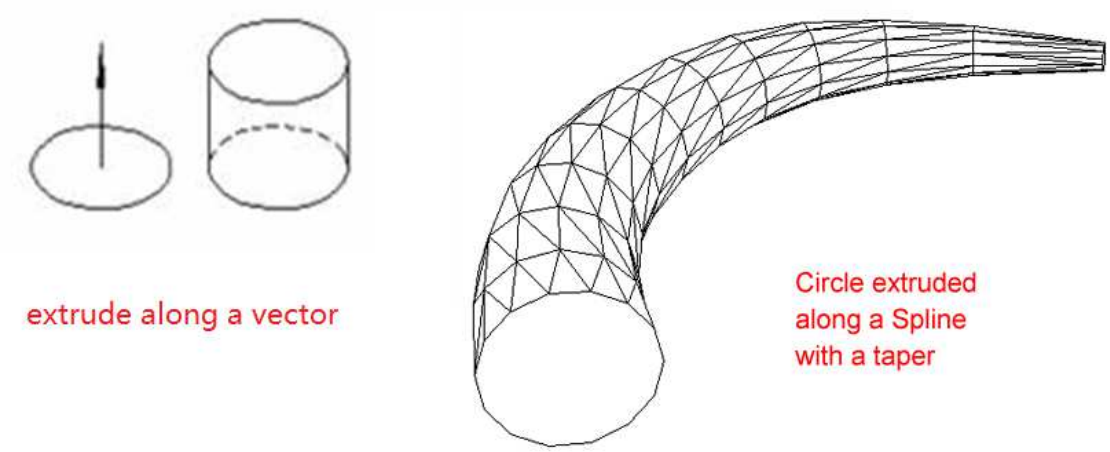
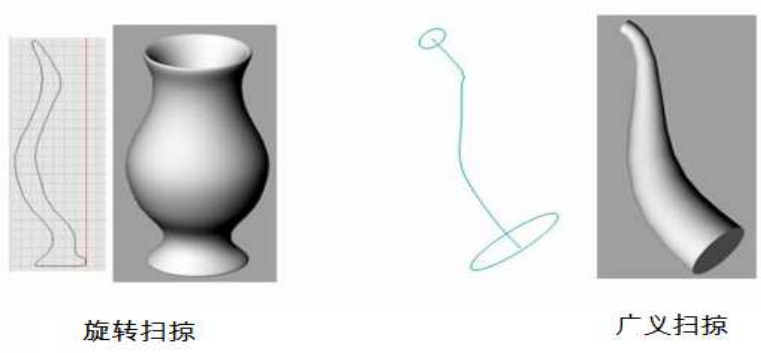


figure 1

Task 2: Sweeping solid modeling

The input for sweeping operation will include a profile curve and a axis line. The solid is generated with the profile revolving around the axis. See figure 2



The solid generated by extruding and sweeping could be approximated by discrete polyhedral like the figure 1.b).

You could draw the profile and path or axis first interactively, then a solid is

generated and you can rotate it with key or mouse. To help you designing the profiles and viewing the solid, you can show two viewports with one for designing the planar curve and the other viewport showing the generated solid. Of course you can switch the OpenGL projective mode between perspective mode and orthogonal.

This programming exercise are due 2012/11/25 PM at 23:59