

MEEM 5408 Design Automation: Theory and Implementation
ASSIGNMENT 5 - FALL 2004
“Automated Model Simplification”

Write, compile and document a C++ program that automatically suppresses small hole features in a UG part model. This program would be a useful tool to assist in simplifying geometry when meshing for finite element analysis. The assignment will require identifying hole features, evaluating the diameter, and suppressing the feature if necessary. This assignment will require using the C and C++ UG interfaces.

1. Create a UgSession object to start a UG session.
2. Use the UgSession object to access the work part object (UgPart).
3. Identify simple hole features in the work part:
 - a. Use iterateFirst() and iterateNext() to iterate through the linked list of UGTypedObject's contained in the work part.
 - b. For each UGTypedObject, use dynamic_cast to determine whether the object is a UgFeatureObject, and to get the pointer to it if it is.
 - c. For each feature, call getTag() in order to identify this feature when using the UG C interface.
 - d. Call UF_MODL_ask_feat_type() to find out whether the type is a simple hole (SIMPLE_SMHOLE).
4. For each simple hole, evaluate whether the diameter is less than some limit:
 - a. Call UF_MODL_ask_simple_hole_parms() to obtain the dimension expressions.
 - b. Use sscanf() or some other function to read the number into a double variable. (Assume that expressions are always just a single number.)
 - c. Compare the value with the limit.
5. For each hole with diameter less than the limit, call suppress(). Note that there cannot be any features dependent on the feature being suppressed.

If you wish to simplify a different type of feature from the simple hole, that can be done instead.

The program and documentation must be developed individually. You may discuss how to do something with others, but you may not look at source code or reports from others, and they may not look at yours.

Write up a report with the same sections as in the first assignment. The source code must be fully documented, including the same header information specified in the first assignment. **The source code will be evaluated for style, neatness, correctness and efficiency.**

Email the source code to me at bettig@mtu.edu. The report must be handed-in in class. The report and source code are due Friday, November 19.