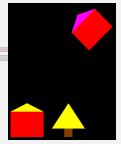
Scene Graphs

Scene Descriptions

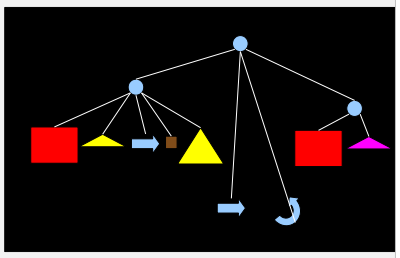
- a *model* is a representation of the important features of the entity being modeled
- a *geometric model* is a collection of components with inherent geometric properties
- includes
  - spatial layout and shape of components
  - material properties
  - connectivity of components
- a *scene description* goes beyond just the objects in it
  - geometric model for each component
  - position and parameters for lights
  - configuration of camera

Hierarchical Scene Descriptions



- a scene description is often represented as a tree or DAG – *scene graph*

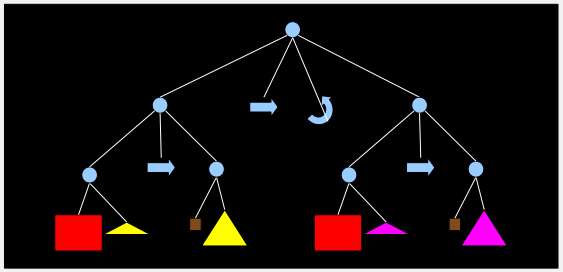
```
push
 push
  color red
  rectangle 10 10 80 60
  color yellow
  triangle 10 70 90 70 50 90
  translate 100 0
  color brown
  rectangle 40 10 20 20
  color yellow
  triangle 10 30 90 30 50 90
 pop
 translate 200 200 0
 rotate 45 0 0 1
 push
  color red
  rectangle 10 10 80 60
  color purple
  triangle 10 70 90 70 50 90
 pop
pop
```



- preorder traversal
  - push current transform at each compound object node
  - visit children left to right
  - pop when done with subtree
- current transform, drawing properties stay in effect until changed, regardless of the level in the tree

Hierarchical Scene Descriptions

- can have many levels



Hierarchical Scene Descriptions

- can be a DAG (directed acyclic graph)