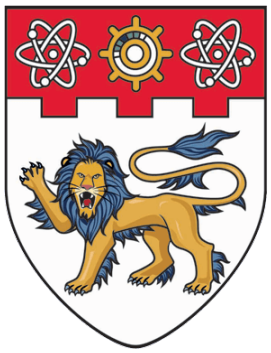

NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

CZ2003 Computer Graphics and Visualisation

Experiment 1: Visualisation using polygons

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Matriculation Number: XXXXXXXXX

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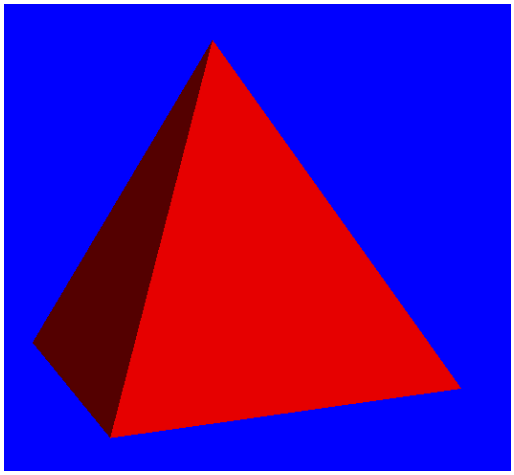
Exercise 1

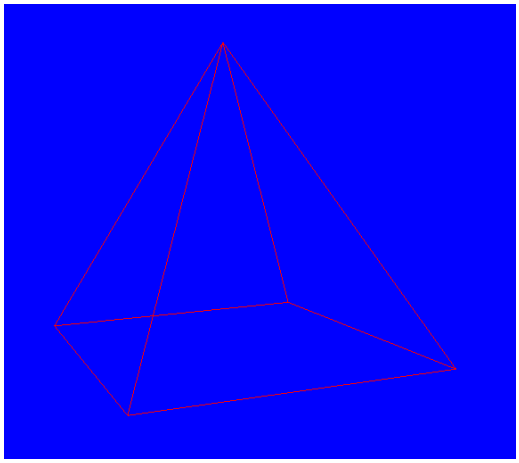
simple polygon mesh as it is illustrated in Fig. 3:



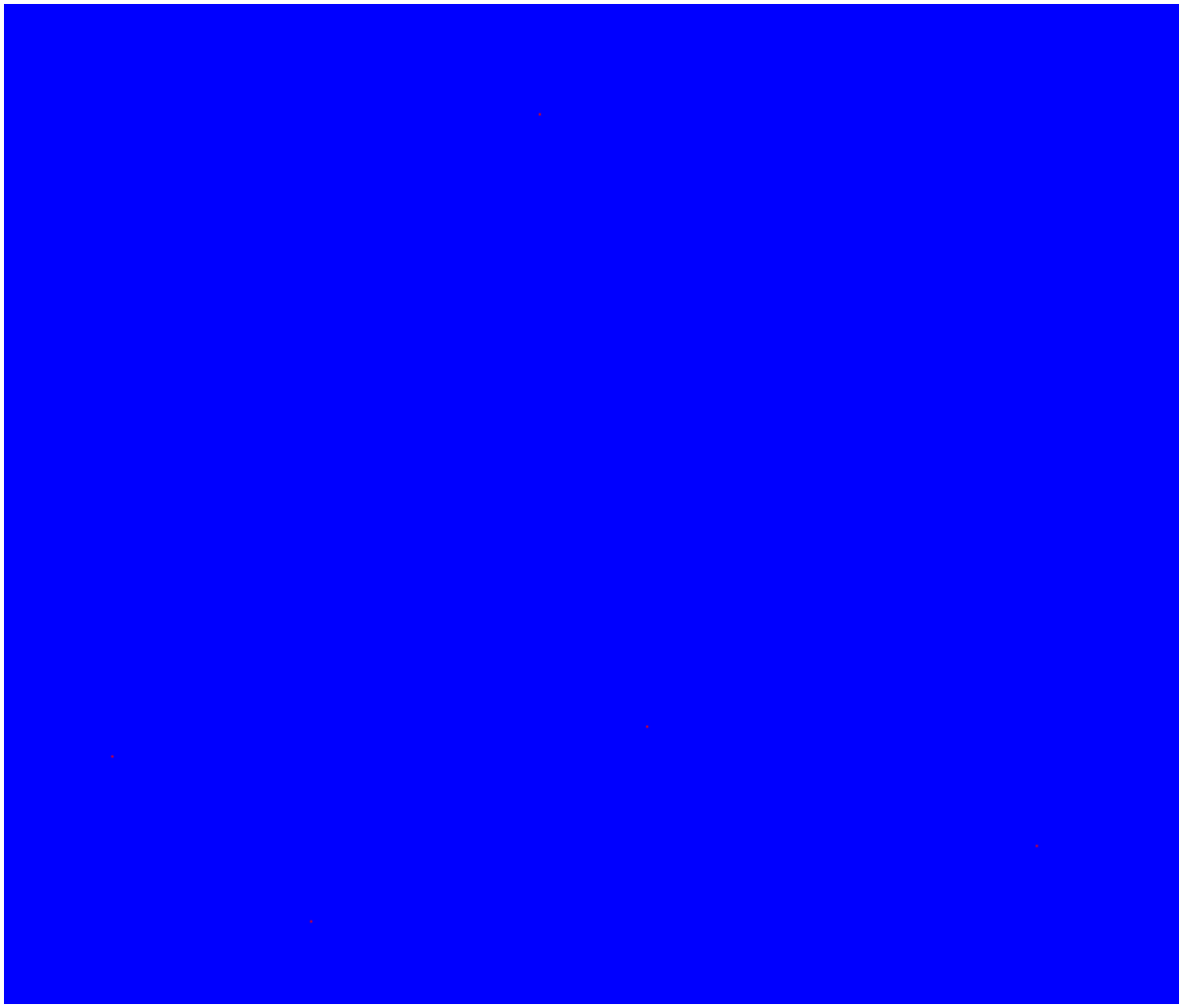
- just a red pyramid

Exercise 2

Wireframe:

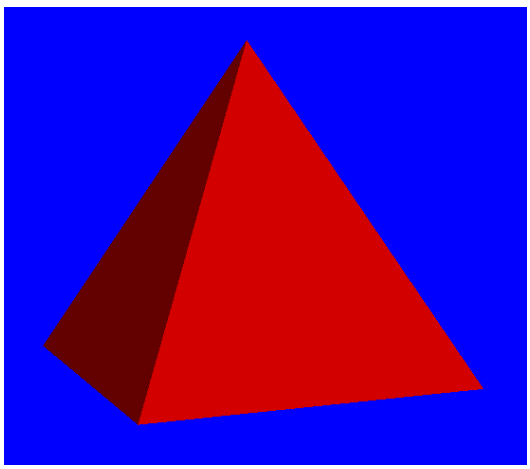


Vertices:



- the vertices are very small and can hardly be seen

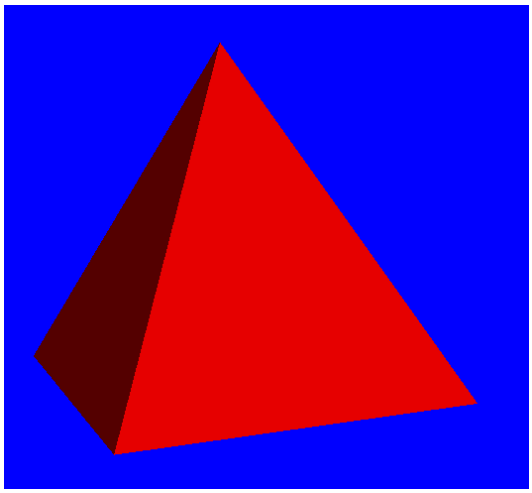
Flat:



- looks just like Smooth (default graphics mode) to be honest

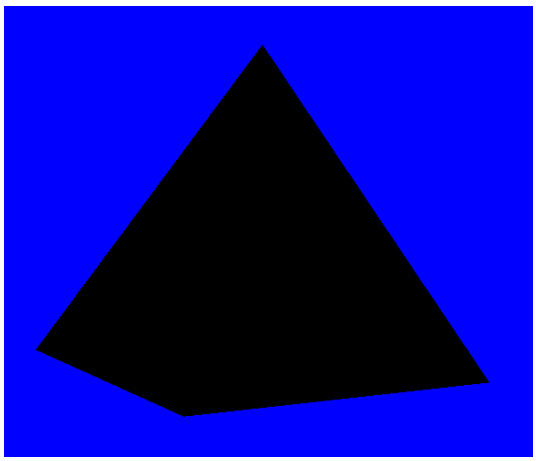
Exercise 3

diffuseColor 1 0 0 #red=1, green=0, blue=0:

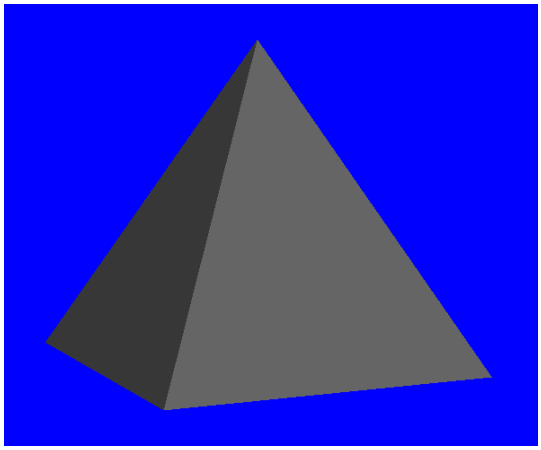


- default pyramid that is provided (polygons.wrl under folder “Provided_Shapes”)

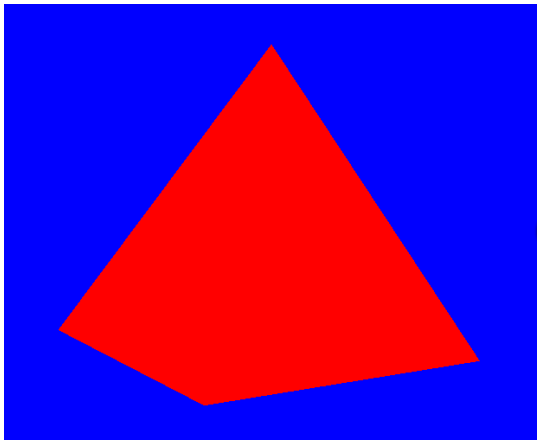
diffuseColor 0 0 0 #red=0, green=0, blue=0:



diffuseColor 0.5 0.5 0.5 #red=0.5, green=0.5, blue=0.5:

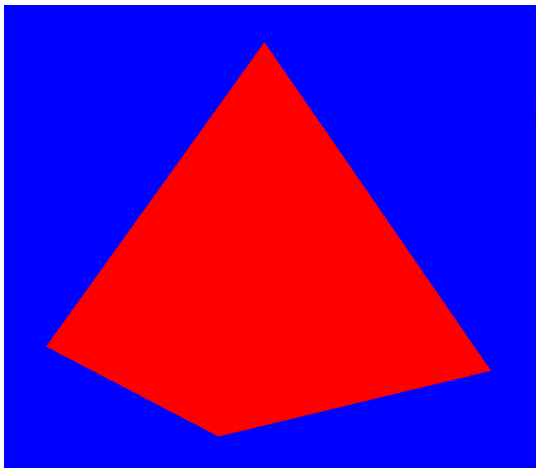


diffuseColor 2 0 0 #red=2, green=0, blue=0:



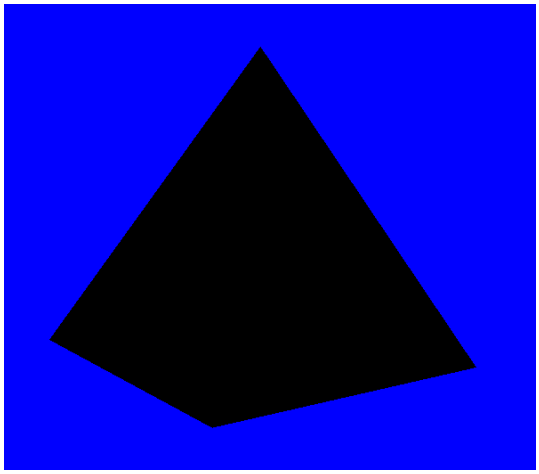
- looks like it is glowing

diffuseColor 9999 0 0 #red=9999, green=0, blue=0:



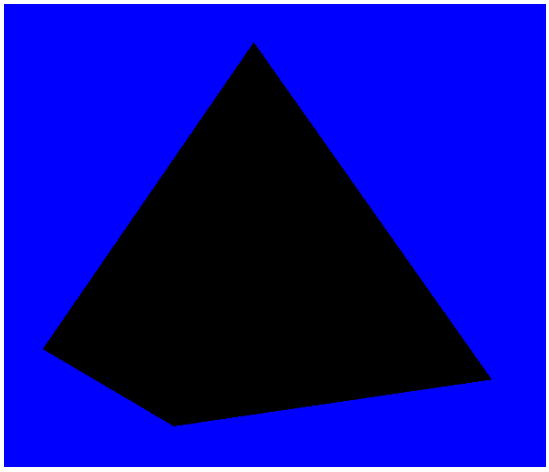
- looks the same as when red=2

diffuseColor -1 0 0 #red=-1, green=0, blue=0:



- looks the same as when red = 0

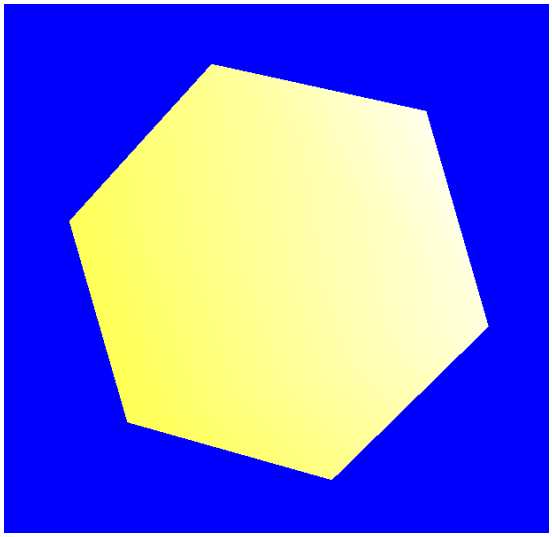
diffuseColor -9999 0 0 #red=-9999, green=0, blue=0:



- looks the same as when red = 0 or when red = -1

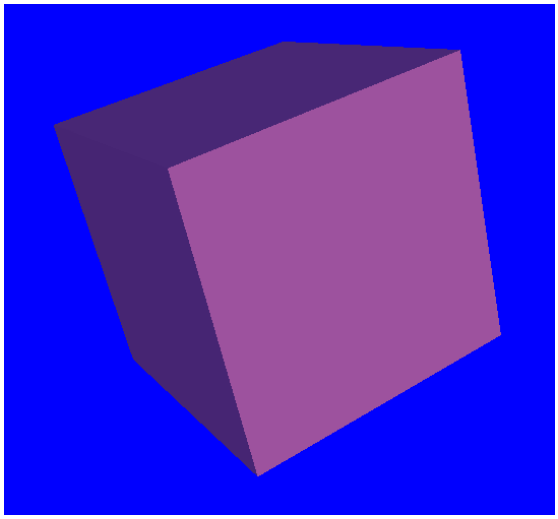
Exercise 4

2D regular hexagon(six-sided equilateral and equiangular polygon):



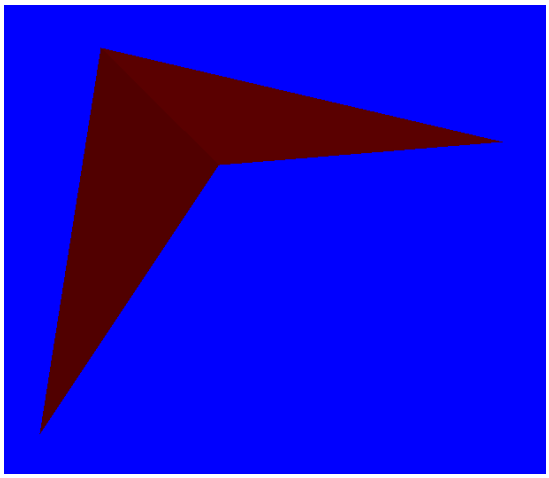
- material: diffuseColor 1 1 0; shininess 0.3
- centre of hexagon: (0, 0, 0)
- vertices
    - all at a distance of 1 unit from centre of hexagon
        - start from vertex (1, 0, 0), then increase by angle π/3 for each subsequent vertex
    - coordinates defined using floating point numbers
        - rough estimation of values obtained from sinusoidal functions
    - listed both clockwise and anti-clockwise under coordIndex field
        - based on right-hand grip rule, normal is formed in both directions, such that both surfaces of the hexagon are visible

3D cube:



- material
  - diffuseColor 1 0.5 0.5
  - specularColor 0.5 1 1
  - transparency 0.3
  - shininess 0.5
- centre of cube: (0, 0, 0)
- length of cube: 2
  - coordinates of each of the 8 vertices are combinations of ±1
- each of the 6 surfaces is defined by listing the vertices that made up a surface in anti-clockwise order
  - normal of each surface points outwards

Exercise 5



- order of vertices that made up the square base is reversed
  - normal points in the opposite direction (based on right-hand grip rule), such that square is not visible from the outside of the pyramid

Exercise 6

- refer to the folder “Created_Shapes”

Exercise 7

- refer to this report