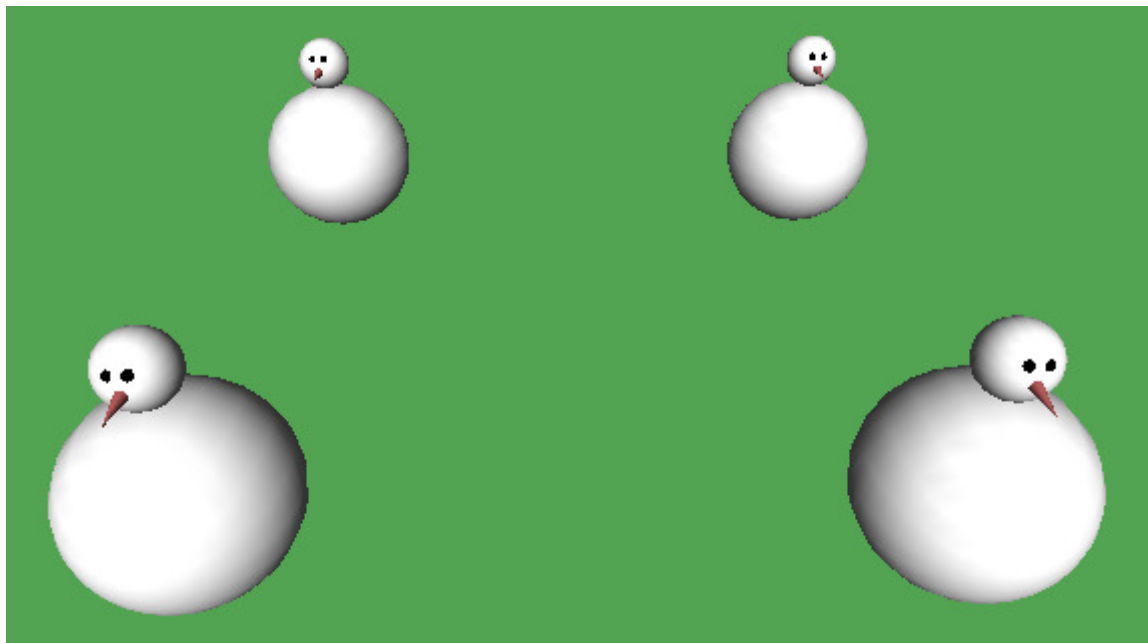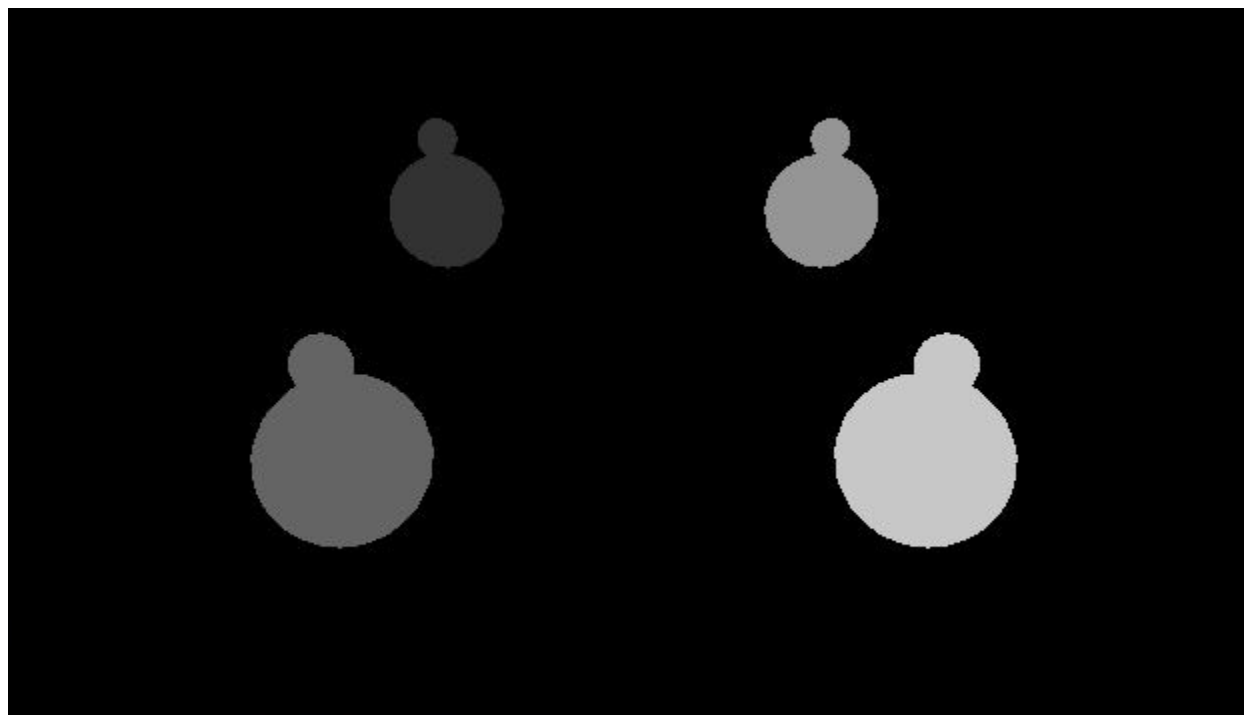# COMPUTAÇÃO GRÁFICA

Picking

Picking

- Identifying objects on screen.

Picking

- Approach:
  - Color/Tone coding

Picking

- Algorithm

    – Turn off lighting and texturing.

    – Draw each object with a distinct color
        - Do not swap buffers

    – Read the pixel under the mouse

    – Turn on lighting and texturing.

Picking

- Mouse click starts the process

```
void processMouseButtons(int button, int state, int xx, int yy)
{
     if (state == GLUT_DOWN)  {
          if (button == GLUT_MIDLE_BUTTON) { // Middle button
                unsigned char result = picking(xx,yy);
                if (result)
                     printf("Picked Snowman %u\n", result);
                else
                     printf("Nothing selected\n");
          }
     ...
}
```

Picking

- Picking function overview

    - Turn off lighting and texturing
        ```
        glDisable(GL_LIGHTING);
        glDisable(GL_TEXTURE_2D);
        ```

    - Clear the frame buffer and place the camera
        ```
        glClear(GL_COLOR_BUFFER_BIT);
        glLoadIdentity();
        gluLookAt(...);
        ```

    - Draw coded version of objects taking advantage of the values stored on the depth buffer
        ```
        glDepthFunc(GL_LEQUAL);
        .... draw
        glDepthFunc(GL_LESS);
        ```

Picking

- Picking function overview (2)

    – Read pixel under mouse position
    ```
    GLint viewport[4];
    unsigned char res[4];
    glGetIntegerv(GL_VIEWPORT,viewport);
    glReadPixels(x,viewport[3]- y,1,1,
                 GL_RGBA,GL_UNSIGNED_BYTE, res);
    ```

    – Reactiva lighting and texturing
    ```
    glEnable(GL_LIGHTING);
    glEnable(GL_TEXTURE_2D);
    ```

    – Return red color component
    ```
    Return res[0];
    ```

Assignment

- Add to the source code provided the ability to pick a snowman with the mouse.