Introduction to Graphics Programming and its Applications

繪圖程式設計與應用

Quiz 3 Buffer & Texture

Examination Time : 17:30~18:20 (50 mins)

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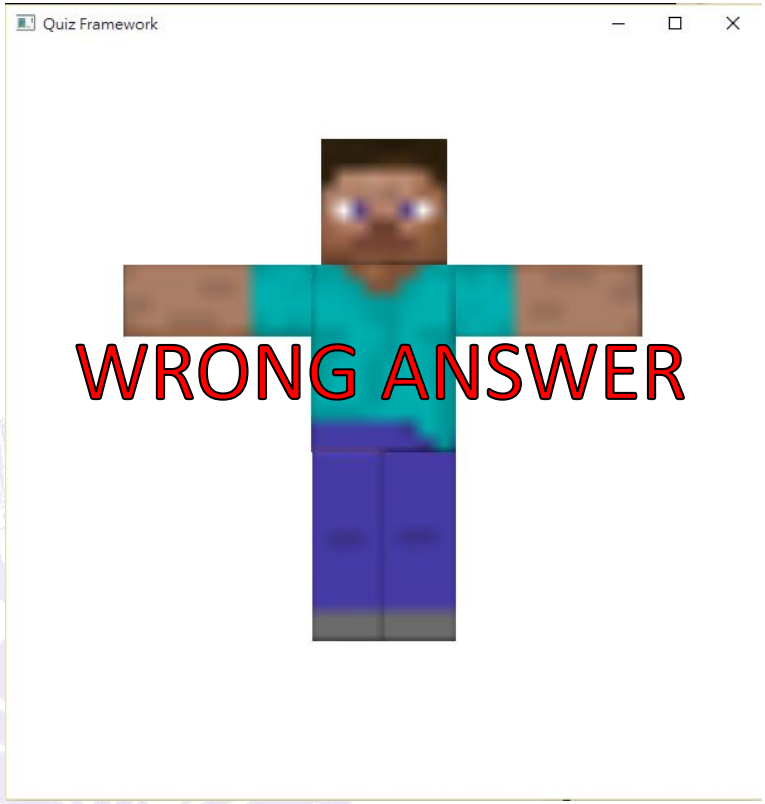
CS4505

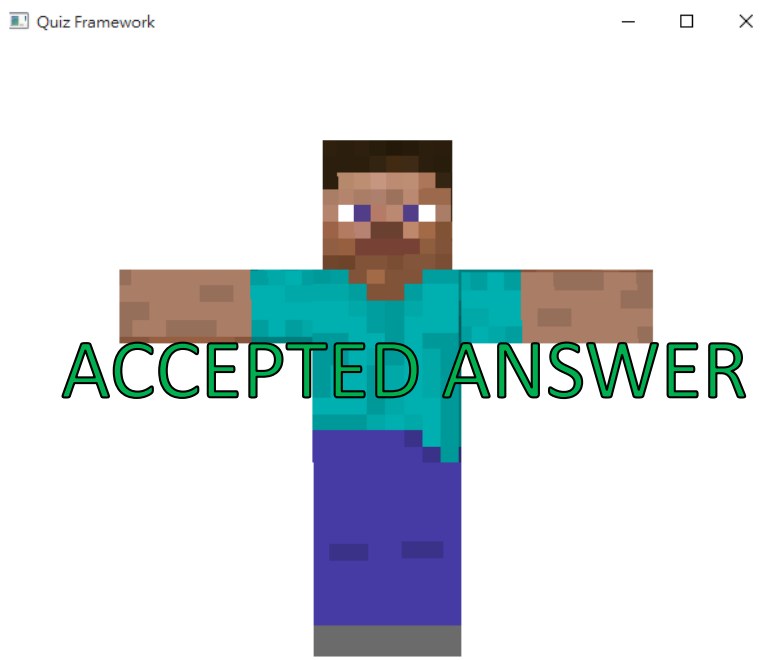
Objective

- Transfer data to GPU and draw a ***textured model***
- Apply ***nearest filtering*** on texture
- Your output must be ***100% identical*** to TA's
- Vertex data in ***mesh_data.h*** and corresponding texture data in ***texture_data.h*** files! (already included in quiz framework)

Objective

- GL_TEXTURE_MAG_FILTER & GL_TEXTURE_MIN_FILTER





Hint

- You only need to modify **main.cpp**
- Search “**TODO**” to find the section you need to code
- Check both **vertex** and **fragment shader** may help you to find the solution

Hint

- Key API Links:
  - glTexImage2D
  - glVertexAttribPointer
  - glTexParameteri

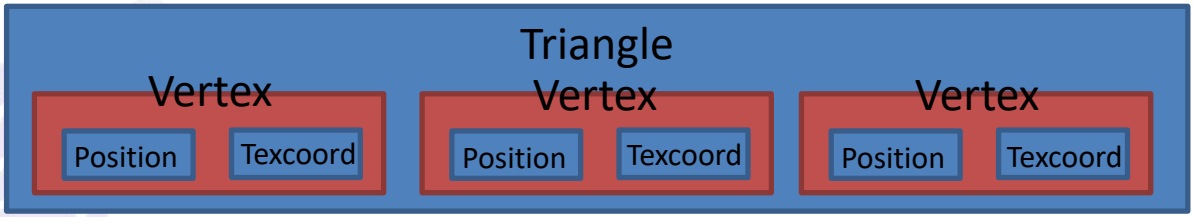
Hint

- Step by step:

1. Generate (**glGenBuffers**), bind (**glBindBuffer**) and fill the buffer with data (**glBufferData**)
2. Assign buffer to vertex attribute (**glVertexAttribPointer**)
3. Enable vertex attribute array (**glEnableVertexAttribArray**)
4. Generate (**glGenTextures**), bind (**glBindTexture**), fill (**glTexImage2D**), and apply nearest filtering (**glTexParameteri**)
5. Pass the mvp matrix and the texture to shader uniform (**glGetUniformLocation**, **glUniform***)
6. Issue draw call (**glDrawArrays**)

Hint

- ***mesh_data.h*** format:
- **1200** floating point numbers, representing **80** triangles
- Vertex positions(vec3) and texture coordinate values(vec2) are ***interleaved***
- ***Open the file and see for yourself!***



Hint

- ***texture_data.h*** format:
- **6144** unsigned char numbers, representing a **64 * 32 * RGB** image
- ***Open the file and see for yourself!***

Rules

- You **cannot**:
  - Copy & paste others' code
  - Ask others to code for you
  - Use internet, Google, StackOverflow, etc.
  - Discuss with your classmates nor TAs
- You **can**:
  - Check any hangouts of this course
- Demo your program window to TAs before you leave the PC room