Identification of Required Unit Technologies

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Modules:

- Background/Environment:
  From 3D maze scratch, from homework (orbit),
  Details:
  1. Matrix transform
  2. Scene depth
- Route
  Randomize a map when starting the game
  Details:
  1. Representation of the map(vector vs. ...background switch)
- Player
  Movement: forward, left, right, leap, stable speed

External libraries:

opengl, fs*, linear algebra libraries (GMTL, Eigen, IMSL, etc.)

1. Opengl is used for 3D building and environment reconstruction.
2. fs* libraries are used for event-driven GUI construction.
3. Linear algebra libraries are used for matrix transform, which might be encountered during the game.

Data Structure:

- Vector (Jing Zhao)
  Use Vector to store the global and local coordinates, effectively represent the location of map and location of player to 1) build the route of the environment 2)calculate the exact location of player referenced by the map 3) confirm the state of player(alive or not)
- Hash Table (Boxian Deng)
  Hash table is a data structure where we can get the value of the key with O(1) time complexity. We can use map in C++ standard library.
- Binary Tree (Minjun Xu, Zi Li)
  Binary Tree can store data and search in O(logn) time complexity. It can be used for searching the current status of the character in an area.