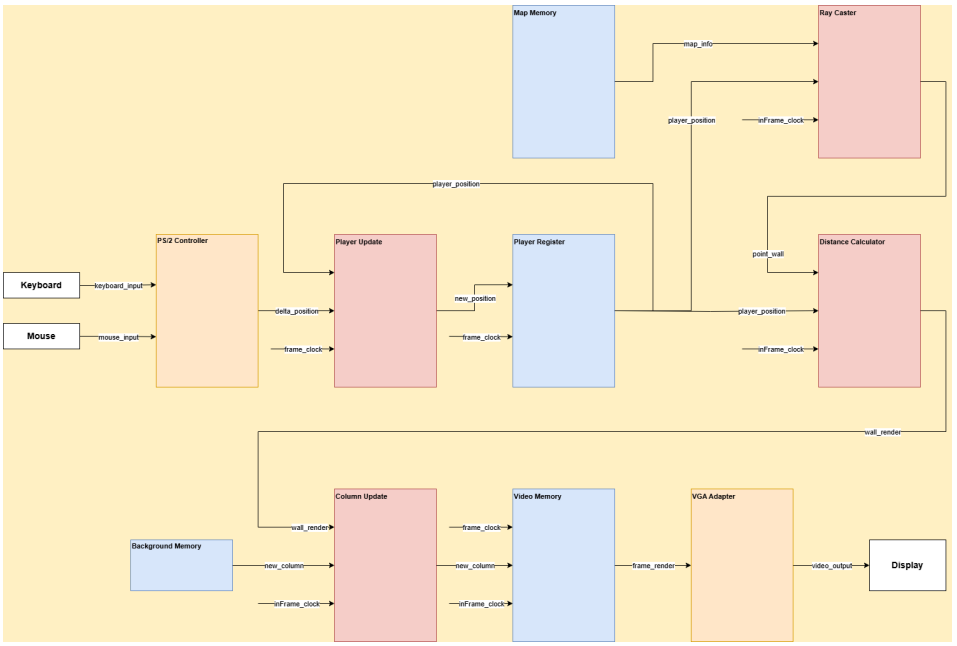
Project Proposal

Summary

The project involves creating a 2D maze game in which players can control both their position and viewing direction. The game will cast multiple rays from the player's current position in the direction they are facing, detecting intersections with maze walls. Based on these ray intersections, the game will determine visible areas and distances.
If time permits, a 3D visual output will also be implemented, where each column of the display is rendered according to the length of the rays until they hit a wall. Similar to the first-person perspective maze game *Wayout* (1982).

Block Diagram:



Project Schedule

Week 1

Apiwich:
Complete: *VGA_Adapter, Video_Memory*. Connecting frame memory to the VGA display
Albert:
Complete: *Map_Memory, Player_Register, Video_Memory.*
Milestone 1: Display the game map and player on the VGA display

Week 2

Apiwich:
Complete: *PS/2_Controller*, *Player_Update*.
Albert:
Complete: *Ray_Caster, Distance_Calculator*.
Milestone 2: Demonstrate on the VGA display that the position and direction of a block can be changed using the keyboard. Rays will also be cast from the player in the current direction until they intersect with walls.

Week 3

Apiwich:
Complete: Modify *Ray_Caster, Column_Update, Background_Memory, Video_Memory.* So that within each frame, each column is rendered and stored in the *Video_Memory.*
Albert:
Complete: Connection of *inFrame_clock* and *frame_clock* to each module so that we can update each column in a frame for each clock cycle of *inFrame_clock*, and update the frame per clock cycle of *frame_clock*.