Assignment 1

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1. Function and Environment
    1. Environment
        1. OS: macOS Mojava v10.14
        2. IDE: xcode
        3. OpenGL 4.1

    2. Function
        1. Menu
            1. Timer
                1. Start:start the timer
                2. Stop:stop the timer

            2. Speed
                1. Faster :Act faster
                2. Slower:Act more slowly

            3. Exit: end the program

        2. Move
            1. Key 'q': move away from us
            2. Key 'e': move toward us
            3. Key 'a': move to the left
            4. Key 'd': move to the right
            5. Key 'w': move down the robot
            6. Key 'd': move up the robot

        3. Action
            1. Key 'k':Walk
            2. Key 'j':Stand

        4. Tex
            1. Key 't':Change the texture

2. Relation and Transform

P*V*M(head)*M(torso)

P*V*M(torso)

P*V*M(l_arm_joint)*M(torso)

P*V*M(r_arm_joint)*M(torso)

P*V*M(l_arm)*M(l_arm_joint)*M(torso)

P*V*M(r_arm)*M(r_arm_joint)*M(torso)

P*V*M(l_a_j2)*M(l_arm)*M(l_arm_joint)*M(torso)

P*V*M(r_a_j2)*M(r_arm)*M(r_arm_joint)*M(torso)

P*V*M(l_a2)*M(l_a_j2)*M(l_arm)*M(l_a_j)*M(torso)

P*V*M(r_a2)*M(r_a_j2)*M(r_arm)*M(r_a_j)*M(torso)

P*V*M(l_leg_joint)*M(torso)

P*V*M(r_leg_joint)*M(torso)

P*V*M(l_leg)*M(l_leg_joint)*M(torso)

P*V*M(r_leg)*M(r_leg_joint)*M(torso)

P*V*M(l_l_j2)*M(l_leg)*M(l_leg_joint)*M(torso)

P*V*M(r_l_j2)*M(r_leg)*M(r_leg_joint)*M(torso)

P*V*M(l_l2)*M(l_l_j2)*M(l_l)*M(l_l_j)*M(torso)

P*V*M(r_l2)*M(r_l_j2)*M(r_l)*M(r_l_j)*M(torso)