MS1 – Hybrid Engine {2D, 3D, Animation}

Student Information

Integrity Policy: All university integrity and class syllabus policies have been followed. I have neither given, nor received, nor have I tolerated others' use of unauthorized aid.

I understand and followed these policies: (•) Yes ( ) No

Name: Sherwin Rad

Date: 1/22/2022

Submission Details

Final ***Changelist*** number: 128073

Verified build: (•) Yes ( ) No

YouTube Link: https://youtu.be/20QAmGEfNSY

Required Configurations: Debug - with Memory Tracking

Discussion (What did you learn):

I've gotten a lot more comfortable moving around the graphics system in our Engine. Particularly with understanding how things get drawn onto the screen. Additionally, I've gotten really comfortable with the converter. This is mainly because I spent a few days completely revamping the converter to be nice, clean, and much more future proof (which was evident by how easy it was for me to setup fonts in the converter).

YouTube Process

- Record the YouTube demo
  - You need to record with commentary
  - Suggestion: ***Filmora*** or ***OBS*** screen capture
- Record the desktop (enough to show your directory and the visual studio and output)
  - Show your directory in recording
    - Launch the visual studio (double click solution)
  - Show off relevant parts of the code with commentary
  - Launch and demo the milestone
  - Watch your video
    - Verify that video clear and can you hear the commentary with audio in stereo?
- Note: Milestones Demo cannot be longer that 5:00 mins
  - If you go over… do it again
- Publish your YouTube recording
  - Make sure it is accessible without any login or permission to play
  - It can be private but not restrictive to play by anyone with the link
- Submit your code to perforce to the appropriate PA directory
  - Verify it
- Submit your YouTube shortcut to student directory:
  - ***MS1_FirstName_LastName.url***
    - Example: MS1_Ed_Keenan.url
- Place the shortcut in your student root directory
  - //ClassDepot/student/CampusConnectID/***MS1_FirstName_LastName.url***
  - ***Example:***
    - *//ClassDepot/student****/ekeenan2/MS1_Ed_Keenan.url***

Pdf form (this document)

- *Submit this PDF to perforce*
  - *Fill in form*
    - *Name, changlelist, etc…*
  - *Submit back to perforce*
    - *Check it out*
    - *Submit it back to perforce to the same location*

Verify Builds

- Follow the Piazza procedure on submission
  - Verify your submission compiles and works at the changelist number.
- Verify that only MINIMUM files are submitted
  - No – Generated files
    - *.pdb, *.suo, *.sdf, *.user, *.obj, *.exe, *.log, *.pdb, *.db, *.user
    - Anything that is generated by the compiler should not be included
  - No – Generated directories
    - /Debug, /Release, /Log, /ipch, /.vs
- Typical files project files that are required
  - *.sln, *.cpp, *.h
  - *.vcxproj, *.vcxproj.filters, CleanMe.bat

Standard Rules

Submit multiple times to Perforce

- Submit your work as you go to perforce several times (at least 5)
  - As soon as you get something working, submit to perforce
  - Have reasonable check-in comments
    - Points will be deducted if minimum is not reached

Write all programs in cross-platform C++

- Optimize for execution speed and robustness
- Working code doesn't mean full credit

Submission Report

- Fill out the submission Report
  - No report, no grade

Code and project needs to compile and run

- Make sure that your program compiles and runs
  - Warning level ALL …
  - NO Warnings or ERRORS
    - Your code should be squeaky clean.
  - Code needs to work "as-is".
    - No modifications to files or deleting files necessary to compile or run.
  - All your code must compile from perforce with no modifications.
    - Otherwise it's a 0, no exceptions

Project needs to run to completion

- If it crashes for any reason…
  - It will not be graded and you get a 0

No Containers

- NO STL allowed {Vector, Lists, Sets, etc...}
  - No automatic containers or arrays
  - You need to do this the old fashion way - ***YOU EARNED IT***

Leave Project Settings

- Do NOT change the project or warning level
  - Any changing of level or suppression of warnings is an integrity issue

Simple C++

- No modern C++
  - No Lambdas, Autos, templates, etc…
  - No Boost
- NO Streams
  - Used fopen, fread, fwrite…
- No code in MACROS
  - Code needs to be in cpp files to see and debug it easy
- ***Exception:***
  - implicit problem needs templates

Leaking Memory

- If the program leaks memory
  - There is a deduction of 20% of grade
- If a class creates an object using new/malloc
  - It is responsible for its deletion
- Any ***MEMORY*** dynamically allocated that isn't freed up is ***LEAKING***
  - Leaking is ***HORRIBLE***, so you lose points

No Debug code or files disabled

- Make sure the program is returned to the original state
  - If you added debug code, please return to original state
- If you disabled file, you need to re-enable the files
  - All files must be active to get credit.
  - Better to lose points for unit tests than to disable and lose all points

Allowed to Add files to this project

- ~~This project will work "as is" do not add files…~~

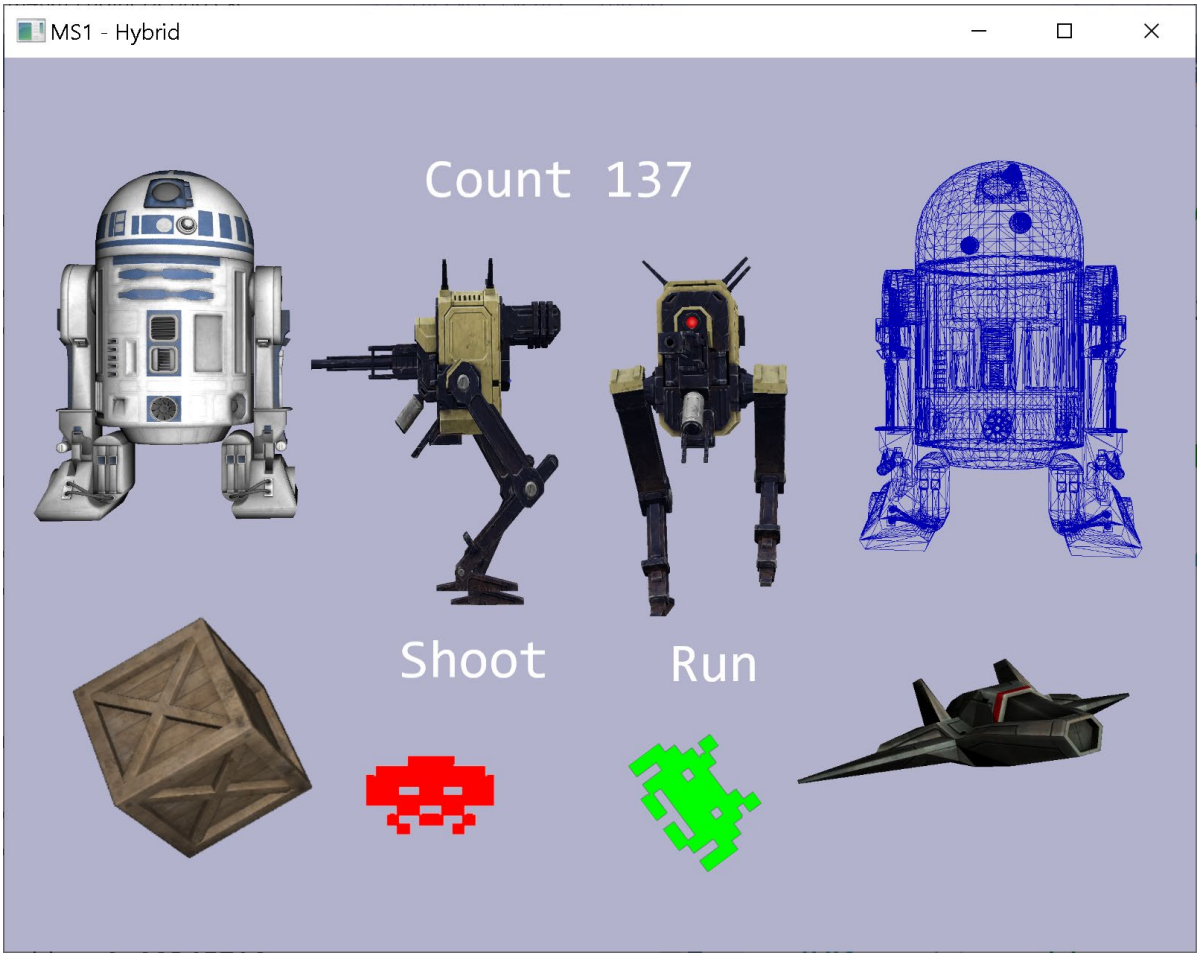
Due Dates

- See Piazza for due dates
- Submit program perforce in your student directory assignment supplied.
- Fill out your this ***Submission Report*** , ***PA*** and ***YouTube link*** to perforce
    - ***ONLY*** use Adobe Reader to fill out form, all others will be rejected.
    - Fill out the form and discussion for full credit.

Goals

- Learn
    - Protocol Buffers for all assets
        - Texture, 3D Meshes, 3D animation Clips, Fonts
    - 2D Game Engine with Sprites
        - 2D Sprites
        - Font systems
    - 3D Engine with at least 2 models being displayed
    - 3D Animation with support
        - 2 animations on the screen playing different animation clips
    - No Memory Leaks!!

Assignments



Mockup of a screen.

1. **Export at *least 4* Animations from 1 skeletons**
    - Displaying two different animation clips on the screen at the same time
    - You **NEED** to show animations switching **Dynamically**
        - Use a keyboard press to change animations
            - Switching animations
                - Does not need to be blended with other animation
                - A hard switch is OK
    - You **NEED** to show two different skeletons at the same time
        - Example: ChickenBot – run and shooting

2. **At least 2 different 3D rigid models need to be displayed**
    - These models should rotate to show the matrices are working

        - At **DIFFERENT** rates of rotation
    - You can display more than 2 models…
        - At least two need to be different
            - With different rotations

3. **Demonstrate the 2D font system**
    - Place 2-3 strings on the screen
        - One string needs to be dynamically changing
            - Example: counting

4. **Demonstrate the 2D Sprites**
    - Place 2-3 sprites on the screen
        - Aliens red and green for example

5. **All data needs to be in Google Proto buffer**
    - Texture, Animation Skeleton, Animation Data(clips)
    - 3D Models, Font data

6. **No MEMORY leaks**
    - Make sure your project isn't leaking at All
        - Run in Debug with the new Memory tracking enabled

Validation

Simple checklist to make sure that everything is submitted correctly

- Submitted project to perforce correctly
    - Is the project compiling and running without any errors or warnings?
    - Is the submission report filled in and submitted to perforce?
    - Follow the verification process for perforce
        - Is all the code there and compiles "as-is"?
        - No extra files
    - Is the project leaking memory?
- Submitted the YouTube link to perforce?

Hints

- Do this assignment by iterating and slowly growing your project
  - You won't be able to finish this assignment in one day - Start now
- Getting the 3D, Animation and 2D working together
  - They need to be working first before you can tweak layout and demo
- 3D game object and Animation object should be cut and paste from GAM 575
  - But now its needs to be in Google Protocol Buffers
- 2D is the new part…
  - Follow the demo in class
    - 2D Sprites
    - Fonts
- Get one sprite working
  - Then focus on the font system
- Memory Leaking
  - Use the new memory system to find your leaks