MS1 – Hybrid Engine {2D, Font, 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: Rachel Micolichek

Date: 02/23/24

Submission Details

Final ***Changelist*** number: 211663

Verified build: (•) Yes ( ) No

YouTube Link: https://youtu.be/MM-24WncfFk

Required Configurations:

Discussion (What did you learn):

I spent a lot of time data driving the animations so that I could just convert the animation and add it easily to my engine. Additionally, I went through how to use fonts and display a counter. Lastly, I had to remember how to specify a single rectangle from a group of sprites.

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

Pdf form (this document)

- *Submit this PDF to perforce*
  - *Fill in form*
    - *Name, changelist, 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…~~

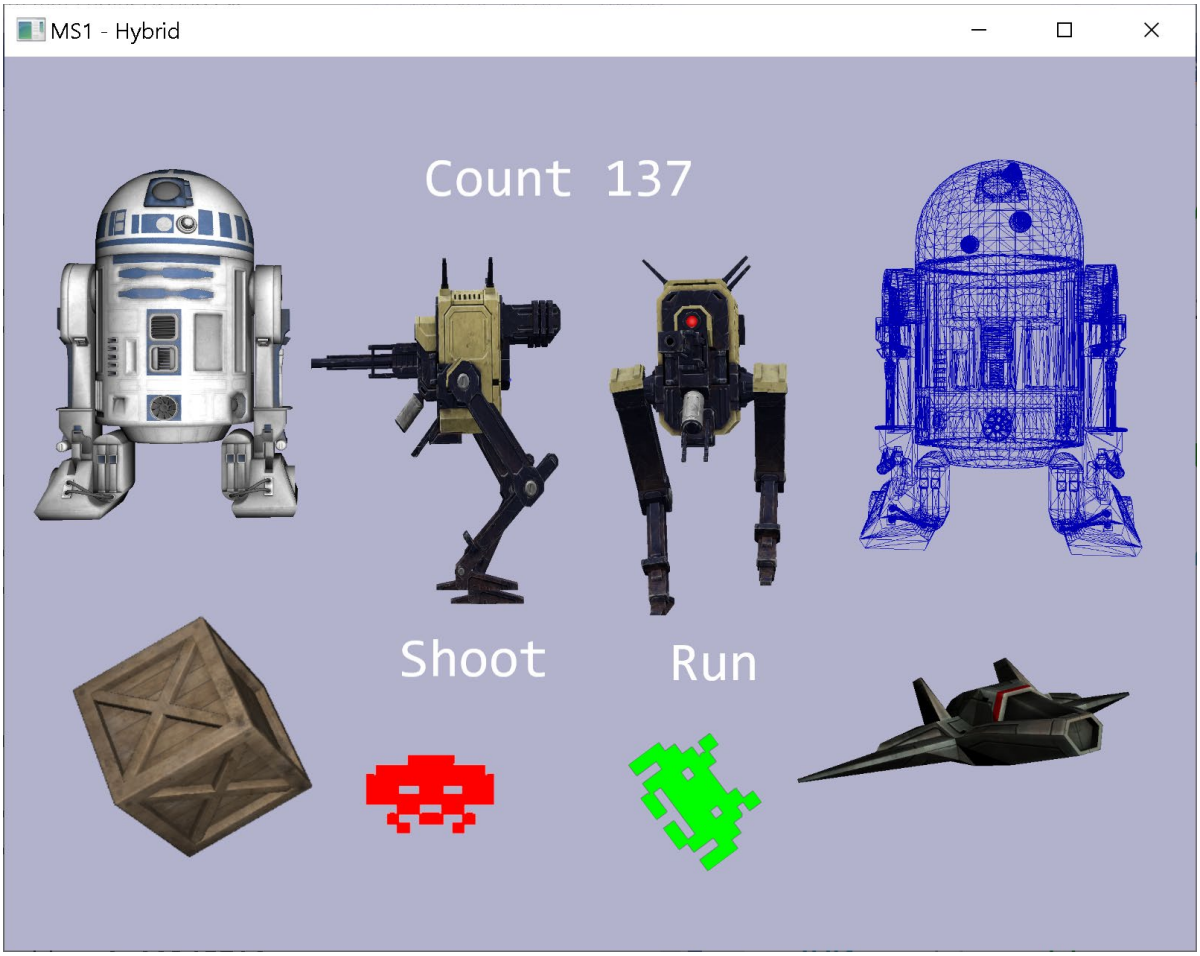
Due Dates

- See Piazza for due dates
- Submit program perforce in your student directory assignment supplied.
- Fill out your this ***Submission Report*** and ***PA*** with ***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
        - Must be data driven
            - Sprites from protocol buffer
            - Font from protocol buffer
    - 3D Engine with at least several models being displayed
        - Required
            - R2D2 – with texture
            - R2D2 – wireframe
            - Wooden Crate
            - Space Frigate
        - Must be data driven
            - Models from protocol buffer
            - Textures from protocol buffer
    - 3D Animation with support
        - 2 animations on the screen playing different animation clips at a time
            - Your choice which clips
            - Must be data driven from protocol buffer
                - Skeleton
                - Clips
    - No Memory Leaks!!

Assignments



Mockup of a screen.

1. **Export at *least 4* Animations from ChickenBot skeleton**
    - 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
    - Display the name of animation under each ChickenBot

2. **At least 4 different 3D rigid models need to be displayed**
    - Slowly turning in unison
        - R2D2 – with textures
        - R2D2 – wireframe
    - Add Space_Frigate and WoodenCrate on the bottom of screen
        - Add a little complex rotation in 2-3 directions
        - These models should rotate to show the matrices are working
        - At **DIFFERENT** rates of rotation

3. **Demonstrate the 2D font system**
    - Place 2-3 strings on the screen
        - Name of each animation under the ChickenBot
            - As you switch animations… your text changes
        - Add one string that is counting
            - Needs to be changing dynamically
            - 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