ENGR 1181 | Software Design Project: Graphics Preview| Individual

Instructions

Define

- Your task for this application involves part of the Represent step for your final project. Having already made initial decisions about games to create and features to include based on stakeholder feedback, you will now create representative images showing how and where these features will be included in your graphical user interface. Finally, you will use MATLAB to create these images as a draft of what they will be in the final product.
- Use the provided class file: simpleGameEngine.m for this task, as well as a sprite sheet of your choice. You will also need to write your own script as described below. Include comment statements to help organize your script file.
- You are free to choose any sprite sheet, including – ones provided, ones you have edited, or a new one of your creation both now and in your final project. Peruse the provided sprite sheets for images that will support your team's game ideas. Consider what information you want your user to have as they play your game and how you want them to see that information. You will be using the graphics techniques taught for this project to produce preview images of a game you intend to create. These are draft images; they do not need to be exactly as they will be in your final game. If you are considering a custom or customized sprites, these do not need to be finalized for this assignment.
- The final submission for this task is to be individual.

Represent

- Make sketches outlining what you want to display in your SDP Graphics Preview.

Plan

- Download simpleGameEngine.m and an appropriate sprite sheet and create a script file.
- Outline the steps your program will take by adding comment statements.
- Prepare to construct relevant arrays by adding comment statements.

Implement

- Complete the task in your script file.

Evaluate

- In the same PDF document, answer the following reflection questions:
  - Why did you choose these particular sprites and layout?
  - How do your visuals and sprite choices connect to your selected theme (Education, Community Support, or Healthcare)?

Document

- Submit one PDF file which contains the following:
  - Three concept sketches appropriately labeled
  - Three screenshots of in-game images developed using the Simple Game Engine. Each image should be accompanied by at least 1 note describing what is being shown.
  - Answers to the following reflection questions:
    - Why did you choose these particular sprites and layout?
    - How do your visuals and sprite choices connect to your selected theme (Education, Community Support, or Healthcare)?
- Submit your .m file which was used to generate the images
- Submit your .png sprite sheet.

Application Problem

Background

For your final project, you will be creating custom games using MATLAB. While the features your team discovers and decides upon may vary, one feature of games that is consistently valuable is the graphics. To ease the process of creating graphical user interfaces, you are supplied with the *simpleGameEngine* class. This application serves as an opportunity both to practice using the *simpleGameEngine* and to explore and display features that your team wants to implement in your final game.
To successfully complete this assignment, you should have a list of features you would like to include in your games. Now, you will write a MATLAB script that will use the *simpleGameEngine* to display example images from the games you are planning to create, showcasing some of these features.

Problem Statement
You and your team are developing one or more custom games MATLAB. *BrightPixel* Games wants to see early concept art and work-in-progress graphics examples to see where the project is headed and to get a sense for the value the game brings to potential users. Your group is in a brainstorming and delegation phase of the project, so all team members should be creating their own graphics previews.

1. Sketch concept images showing what you think should be shown on screen during gameplay. You will need **at least three**. These can be done on a whiteboard, a piece of paper, or an app such as Paint/PowerPoint/Canva/Google Drawings. If initial sketches were made physically, photograph them for inclusion in your submission. Label where elements like title text, player sprites, score, or buttons will appear.

Note: While it is acceptable to discuss your images with your group, the three you are submitting should be unique to you.

2. Create a MATLAB script that uses the *simpleGameEngine* class to display three example images from your proposed game. You will be submitting the script and screenshots of the generated images.
    a. Each image should come with notes about what is being featured. Use of the title(), xlabel() and text() functions will allow you to display these notes directly in your image window.
    b. At least three uses of the *drawScene()* function to display three in-game images. Each image should be accompanied by at least 1 note describing what is being shown.
    c. The *getKeyboardInput()* or *getMouseInput()* function, or both for transitions required in your code.

Note: The *simpleGameEngine* class will need to be used to start the process of using this tool.

Hints

Create concept images

Before doing any coding, give yourself a clear visualization of what you will be displaying with a concept art sketch. These can be done on a whiteboard, a piece of paper, or an app such as Paint or PowerPoint. Think of the features you want to include in your game - How will you display them for your players?

- If you have menus or splash screens, what will be on them?
- What information will be consistently displayed on the screen, and what will change?
- Will you show whose turn is next or a running score?
- Will you show the player all the available choices?
- Will the game take up the whole screen or window or will there be a border?

As you create three concept sketches for your graphics preview, annotate them. The annotations should be notes explaining what the various parts of the image are. They should show how the parts of the images you will display exemplify the features your users and team want to include. This could be hand-written or included as text next to photographs of physical images.

Create a script

The script you are creating is meant as practice using the *simpleGameEngine* class and as a time for you to consider how your graphics will be arranged. It does not need to include any game logic.

Remember that it is important to initialize your scene first. An example would be:

```
sSize = 16; %sprite size, based on actual size on sprite sheet
zFactor = 5; %zoom factor, based on how big you want displayed images to be
BGC = [167 177 183]; %background color, an RGB value, this being OSU grey
example_scene = simpleGameEngine("my_sprite_sheet.png", sSize, sSize, zFactor, BGC);
```

To display anything with *simpleGameEngine*, you must use the *drawScene*() function, for which you will need one or two 2-dimensional matrixes full of sprite indexes. For example, if your game involves a mouse slowly accumulating cheese, ending with an image of a 5x5 square of cheese wedges surrounded by a 4x4 ring of grass, you could display this with:

```
grass = 8; % assuming the grass sprite is the 8th sprite in the sheet
cheese = 915; %assuming the cheese sprite is the 915th sprite in the sheet
image_one = grass * ones(13); %initialize a 13x13 (4+5+4) matrix to the grass sprite index
image_one(5:9,5:9) = cheese; %change center 5x5 to cheese
drawScene(example_scene, image_one);
```

If you need more than one line of text to explain an image, wait for user input (either via keyboard or mouse click) to change to the next note. Your final script should have at least three different preview images in it; the script should also take an input to move to the next image.