UNIVERSITÉ Concordia UNIVERSITY

ACADEMIC YEAR: 2021-2022

# ASSIGNMENT 2 (2D Game)

**Assignment Posted:** October 04, 2021

**Assignment Due:** October 24, 2021, before 11.59pm

**Final Deadline with 20% flat Penalty:** October 27, 2021, before 11.59pm

## Overview:

Paperboy (an action arcade game from Atari and Midway games during mid-eighties) was one of the more popular games with a perspective view. An interesting game inspired from a simple mundane childhood job. The goal of this game was to gain a good paperboy status by successfully delivering the newspapers for one week. It is a suburban simulator in a perspective view with the streets tilting approximately 45 degrees. In some variations a player can play as a paperboy or a papergirl with three extra lives and ten newspapers. A player must deliver these newspapers to all subscribers and vandalize properties of the non-subscribers by breaking the windows or damaging any item by throwing newspaper. Stacks of newspapers were available along the way to replenish the stock of newspapers. There were multiple obstacles along the way in the form of fences, dogs, skateboarders, remote controlled cars, tornados and even the grim reaper. A player had to dodge some of these and chase some away by throwing newspaper. Crashing into one of these used to cost one life and loss of all lives used to end the game.

Your first Unity programming assignment is to develop a 2D variation of Paperboy but in a COVID-19 context. In this variation rather than delivering papers, the game will have a protagonist fighting against COVID-19 by providing masks and vaccines, disinfecting the surfaces, and promoting social distancing. The game will be a single-screen platformer to be set in a shopping mall or a funfair. Obstacles will be replaced by people of five kinds, fully vaccinated, unvaccinated but wearing a mask, unvaccinated without masks, highly susceptible to infection and infected ones. All five kind of people must be visually distinct and must be attended to accordingly. The player will get a fixed amount of time to attend all the anomalies in a level from passing mask to disinfecting the surfaces glowing due to infection, and even sending infected people in isolation. Additionally, a mob of unmasked shoppers will appear as a short outburst occasionally to offer bonus earning opportunity to the player. The mob will have a mix of all five kind of people and the player will try and achieve as high a score possible. People sent in isolation will immediately leave the scene but can touch various items along the way. The player can promote social distancing via many innovative ways (creative freedom). A non-disinfected surface will spread the virus if left unattended. Highly susceptible people must be attended to first as they may die if exposed to the virus. People with masks are also prone to infection from contact with any of the infected surfaces. A change of level will be felt through the increased difficulty due to fast paced motion or a larger people intake. The goal of the player is to get a high score and, also to complete as many levels as possible.

Image Courtesy: Wikipedia


Image Courtesy: Dreamstime.com

## Basic Game Play:

Points are awarded for successfully averting the spread of the virus and promoting social distancing.

- Every surface that is disinfected will yield 2 points and every missed infected surface will penalize the player with 1 point in addition to further spread of the virus. All people will spawn in random places, will follow random trajectories.
- To add to the challenge, the moving people should increase in speed or in numbers every time there is a change of level.
- The player will be able to hand out two masks at a time if two unmasked people are in the proximity of the player and will get a bonus of 2 points in this case.
- The mod should arrive at least twice in each level at random times.
- The player will be able to address only one anomaly at a time.
- Innovative measures to promote social distancing will yield a 5-point bonus to the player.

## Game Versions:

You have to develop two versions of the game as follows:

- ***Version-Normal*** – In this version, the basic version of the game is implemented as above. The unending game ends when the player reaches a negative score of twenty.
- ***Variant-Special*** - In this version a player can get a speed boost for himself/herself or can slow down time to do as many things as possible. In this special mode, number of people will also increase. The player will use a special key to toggle this mode for a limited time (say, 3 seconds). Missed opportunities will cost 2 points and successful actions will yield 1 point each in this mode.

## User interface and gameplay parameters:

- Design your own user interface using keys for all the specified actions.
- The current score should be displayed on the screen.
- You will have to suitably adjust your gameplay parameters, such as number and types of people, how frequently are they spawned, where do they spawn, are of what kind, speed and speed change factors, *etc.*, so as to yield a playable game.

## Submission:

Assignment must be submitted only through Moodle. No other form of submission will be considered. Please create a zip file containing your source code, all the assets, data files, a README (.txt) file explaining how to read the code, compile, run, and play the game on a PC with Unity. You must also record and submit a short video of the game play in the same zip file. The zip file should be named Assignment#_YourStudentID.

## Evaluation Procedure:

You MUST demonstrate your program to the lab instructor during lab hours, right after the due date. You must run your submitted code, demonstrate its full functionality and answer questions about the Unity programming aspects of your game. Major marking is done on the spot during the demo. Your code will be further checked for structure, non-plagiarism, *etc.* However, ONLY demonstrated submissions will receive marks.

## Evaluation Scheme:

1. Working implementation of Normal version with all game play: (40%)
2. Working implementation of Variant Special with all game play: (15%)
3. Setting and playability (User Interface, Game world, …): (10%)
4. Aesthetics and overall impression: (20%)
5. Q &A (to demonstrate understanding of Unity programming): (15%)

## Ground Rules:

You are welcome to discuss high-level implementation issues with your classmates, but you should avoid looking at other students' code, and under no circumstances should you be copying any portion of another student's code or copying complete code from the Internet. However, seeking help from other students for debugging some portion of your code is reasonable. These "ground rules" are to prevent a student from "freeloading" off another student or from the Internet, even accidentally.