Lab 7 – Debugging

Fork and clone the projects for Git Hub <https://github.com/Abertay-University-SDI/CMP105_W7> . This repository contains a collection of small programs that suffer from some compilation or runtime errors and need fixing.

1. Starting with application Week 7\_1, the application contains a player object that teleports to a random location when the *space bar* is pressed, and an enemy object that teleports to a random location after a set amount of time. However, the application does not compile successfully. You must find and fix the error, in the box below write down what the error was and how you found it (what debugging steps did you take, what information was useful).

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| **Missing “;” in Enemy.h file.** Used the output window which shown all the mistakes. However since the issue was connected to other classes, it shown other stuff as problems even though it was correct. Observed code differences between all headers led me to see the missing “;”. |

1. The application Week 7\_2, this application contains a player object that teleports to a random location when the *spacebar* is pressed, and the player contains a bullet object that spawns at the player’s location and fires when the *Enter* key is pressed. However, the application does not compile successfully. You must find and fix the error, in the box below write down what the error was and how you found it (what debugging steps did you take, what information was useful).

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| **Missing “:” in Player.h file.** Used the Output window to see when the issues started popping out while compiling. This gave me a list of correctly formatted classes. Then in the Error list the error was shown. |

1. Application Week 7\_3 is similar to 7\_2, however this application compiles, but suffers from a runtime error. You must find and fix the error, the fixed application should have a player the teleports and shoots several bullets. In the box below write down what the error was, how you found it (what debugging steps did you take, what information was useful) and how you would fix it.

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| **Uninitialized \*Bullet, threw nullptr.** Had the code start and throw an exception. Visual studio then paused the program at an automatic breakpoint (right where it could not continue) and shown the variable values at that time. Bullet was nullptr even though it shouldn’t been. After the inspection of the code and addition of the “bullet = new Bullet;” into the constructor of the player, the issue was fixed; |

1. Application Week 7\_4 contains a player and bullet objects. This application compiles but suffers from a runtime error. You must find and fix the error, in the box below write down what the error was, how you found it (what debugging steps did you take, what information was useful) and how you would fix it.

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| **The bullet instance was in local scope only.** Hence when passing a pointer to it, it was inaccessible. Used breakpoints to see when exactly the access was brought up as well as commenting lines to see which one was the issue. Fixed by making a new bullet in Heap as then the access is allowed. Also added delete statement to it after a certain position (though this is a temporary fix only) |

1. Application Week 7\_5 contains a player object and a companion object. The player object teleports around the level when *spacebar* is pressed. The companion will teleport to the player object when the *Enter* key is pressed. This application has a compilation error. You must find and fix the error (and make sure the application runs correctly), in the box below write down what the error was, how you found it (what debugging steps did you take, what information was useful) and how you would fix it.

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| **Looping header files in Player and Companion (Chicken and Egg).** Noticed the circular dependency, output was also showing that Companion was undefined (even though it was). Had to look-up stuff online though to know what exactly was the issue. Also reproduced the error with Week7\_4 to be sure. Fixed by changing the Player\* pointer in Companionto GameObject\* pointer as the function only required GameObject functionality. |

1. Application Week 7\_6 contains several *Bits*; small sprites that are given a random position and move up and down from the position. This application compiles but suffers from a runtime error. You must find and fix the error, in the box below write down what the error was, how you found it (what debugging steps did you take, what information was useful) and how you would fix it.

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| **For loops made it so that the index went out of bounds for an array returning nullptr.** Used breakpoints to see when exactly the access issue happens. Noticed that it accesses the array correctly until a certain point. Checking the for loop condition revealed the issue. Fixed it by making the condition from “<=” to “<” |

1. Application Week 7\_7 should render a simple yellow game object near the centre of the window, but it doesn’t. You must find and fix the error, in the box below write down what the error was, how you found it (what debugging steps did you take, what information was useful) and how you would fix it.

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| **GameObject go was initialized twice.** This made the code set attributes to the local instance but render the global instance. Since the global one was uninitialized, it didn’t render it. Fixed by deleting the local instance |

Make sure you show/discuss your answers with a member of staff once completed.

1. The coursework brief is on My Learning Space, under the Assessment tile. Read over the brief and write down a rough outline/design for you coursework game idea. Think carefully and write down how you game meets each of the coursework requirements.