COMP315

Project Documentation

COVID-19 CROSSWORD PUZZLE GAME

|  |  |
| --- | --- |
| **Members** | |
| 1. Ngcebo Hlongwane | 216040995(Group leader) |
| 2. Ayanda Gumede  3.Ntobeko Ngcongo  4.Sanelisiwe Mgudlwa  5.Ziyanda Radebe | 217023113  217045211  219065134  219040270 |

Contents

[Introduction 3](#_Toc106041032)

[User Interaction 3](#_Toc106041033)

[1. User input 3](#_Toc106041034)

[2. User feedback 4](#_Toc106041035)

[3. Score accumulator 5](#_Toc106041036)

[Levels and Progression 7](#_Toc106041037)

[1. Various levels 7](#_Toc106041038)

[2. At least two levels 9](#_Toc106041039)

[3. Display progress of at least one activity 12](#_Toc106041040)

[Programming Techniques 15](#_Toc106041041)

[4. Function 15](#_Toc106041042)

[5. Class 15](#_Toc106041043)

[6. Struct 16](#_Toc106041044)

[7. Pointer 17](#_Toc106041045)

[8. Reference 18](#_Toc106041046)

[9. Struct 19](#_Toc106041047)

[10. Data Structures 19](#_Toc106041048)

[11. Class Template 20](#_Toc106041049)

[12. Function Template 21](#_Toc106041050)

[13. Operator Overloading 22](#_Toc106041051)

[Additional Item/s 24](#_Toc106041052)

# Introduction

Studying using books and newspapers has become a very boring method of learning things, people prefer using their smartphones and computers to do things. A console based Covid-19 Crossword Puzzle game was created to educate people about the dangers of covid-19 and make them aware of this infectious disease and how to prevent it from spreading. We created the game to make a fun way of learning. The data about covid 19 was obtained from the WHO(World Health Organization). This game will help people and the coming generations to learn about covid-19. The game will consist of covid-19 symptoms in the first level then it proceeds to the second level which gives ways of preventing covid-19 from spreading. The game is timed, has a scoreboard and hints are available.

# User Interaction

## User input

|  |  |  |
| --- | --- | --- |
| **Screenshot** | | **Explanation** |
|  | | This asks the user to enter the word based on the clues. It starts from clue number 1 |
| Calendar  Description automatically generated |  |

|  |
| --- |
| **Code Screenshot** |
|  |
|  |

## User feedback

|  |  |
| --- | --- |
| **Screenshot** | **Explanation** |
|  | The word nasal is placed automatically in the appropriate space with 5 characters since nasal contains 5 characters and is across the grid. |
|  |  |

|  |
| --- |
| **Code Screenshot** |
|  |
|  |

## Score accumulator

|  |  |
| --- | --- |
| **Screenshot** | **Explanation** |
|  | The score is 1 since nasal is the correct word. The score accumulated from 0 to 1. |
| Calendar  Description automatically generated with medium confidence | The score now has accumulated from 1 to 2. The requirement is met. |

|  |
| --- |
| **Code Screenshot** |
|  |
|  |

# Levels and Progression

## Various levels

|  |  |
| --- | --- |
| **Screenshot** | **Explanation** |
| Calendar  Description automatically generated | This is during round 1 of 2 rounds. Most of the empty spaces are now filled with the required words. Requirement is met. |
|  |  |

|  |
| --- |
| **Code Screenshot** |
|  |
|  |

## At least two levels

|  |  |
| --- | --- |
| **Screenshot** | **Explanation** |
| A picture containing calendar  Description automatically generated | This is during round two. It displays the words gotten by the user in the puzzle,  displays the score accumulated by the user and the time taken so far in the round. |
|  |  |

|  |
| --- |
| **Code Screenshot** |
|  |
|  |

## Display progress of at least one activity

|  |  |
| --- | --- |
|  | **Explanation** |
|  | The words used for this level are educating about ways of preventing covid19. The grid is completed using spot on words guessed by the user. |
|  |  |

|  |
| --- |
| **Code Screenshot** |
|  |
|  |

# Programming Techniques

## Function

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  The decision to use a function in this area of the project code was necessary.  This is because the member variables of the Category class have private access and thus cannot be directly accessed. In our case, it displays the start of the window, so everyone who have access to the start of our window must be our members. |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Functions increase readability when coding. This gives the code a structure that is easy to work with. Functions are also easy to call when needed.  The objective was met. |

## Class

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  The decision to use a class in this area of the project code was necessary, as classes are the blueprints of object-oriented programming. We used objects of the class to display the instructions to the user. Without instantiating the object class, the same code would have had to be rewritten for each of the 2 levels |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Classes provide an easy way of keeping the data members and methods together in one place which helps in keeping the program more organized. The objective was met. |

## Struct

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  The decision to use a struct was the preferred option (over a class).  Structs are used for lightweight objects, and their member variables have public access which made it easy to write clues using struct, it eventually displays the clues for level1 so nicely to the user before the user plays the game. |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Structs are a way to group several related variables into one place. The objective was met. |

## Pointer

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  Pointers were used in the code to hold the addresses of arguments that were passed by reference. This allowed for the program to access the variables stored in the memory location of the argument instead of creating a local copy in the function, while allowing for access to the memory address stored in the pointer variable if the need arises. |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Pointers store the memory address as its value. A pointer variable points to a data type (like int or string ) of the same type, and is created with the \* operator. The objective was met. |

## Reference

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  We decided to use Reference because they used as an address that indicates where an object’s variable and methods are stored, without copying of the arguments, in our case it displays simple message to the user using the reference |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially | X |
| Completely |  |  |

## Struct

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  The decision to use a struct was the preferred option (over a class).  Structs are used for lightweight objects, and their member variables have public access which made it easy to write clues using struct, it eventually displays the clues for level2 so nicely to the user before the user proceeds to play the next complex level. |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Structs are a way to group several related variables into one place. The objective was met. |

## Data Structures

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  Arrays are more appropriate for storing a fixed number of elements compared to vectors and are a more memory-efficient data structure than vectors. In our case, we used it where the number of elements required of the data structure were known. It accepts words as strings and display them to the user. |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Data structures are user defined data types which allow you to combine data items of different kinds. The objective was met. |

## Class Template

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  So ClassTemplate()(T v1, U v2, V v3). It create object with int, double and char types and display a particular message to the user. The class template can be used multiple times while only being written once. It makes our code shorter and more manageable |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Class templates are used to create a single class to work with different data types. The objective was met. |

## Function Template

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  A function template: template <typename T> which takes different types of numbers as parameters and add them.  The function can be used multiple times while only being written once.  Although it was eventually only used for addition of the type integer, if the need arises for adding of other types to be used, this function will be able carry it out. |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | With templates we can create a single function to work with different data types. The objective was met. |

## Operator Overloading

|  |
| --- |
| **Screenshot:** |
| **Motivation:**  Operator overloading for the += operator was used to overload ++ when used either as prefix or as postfix. This function called operator method, it gives us as programmers flexibility to call a similar method for different types of data and we also used it to create new objects given different amounts of data. |

|  |  |  |
| --- | --- | --- |
| **How have you met the objectives?** | **Cross (X) the appropriate box** | **If you think that you have met the objective completely, provide a short explanation to support the claim** |
| Not met |  |
| Partially |  |
| Completely | X | Improves code readability and allows code reusability and it also saves memory space consistently and speeds up the execution of the program. The objective was met. |

# Additional Item/s

|  |  |
| --- | --- |
| **Screenshot** | **What does your quiz include?** |
|  | A banner for the quiz, which was from an online ASCII art generator, is read from the “banner.txt” file and printed to the console. The banner introduces and gives the console-based quiz some aesthetic flair with the intention of piquing the interest of a potential user.  We also changed the default color of the screen to Blue to make the screen look attractive to the user. |

|  |
| --- |
| **Code Screenshot** |
|  |