**Daniel Alejandro Fernandez Robles** - **A00354694**

**Camilo Enríquez Delgado - A00354532**

**Jesús Daniel Villota Villota - A00354573**

**Juan David Lectamo - A00356255**

**Functional requirements**

|  |  |  |
| --- | --- | --- |
| Name | FR#1 | Add music libraries |
| Summary | Add folders in which the user has stored their audio files. The paths of the directories that the user will be adding to the program will be saved in a serialized file to be loaded each time the application is opened. | |
| Input | A directory chosen by the user through the directory chooser | |
| Output | None | |

|  |  |  |
| --- | --- | --- |
| Name | FR#2 | Play mp3 audio files |
| Summary | The user will be able to listen to their songs while continuing to browse the application or through other programs unrelated to it and will see in real time the time that the song has covered | |
| Input | An int that represents the position of the requested song in the playlist | |
| Output | None | |

|  |  |  |
| --- | --- | --- |
| Name | FR#3 | Remove directories from current libraries |
| Summary | Allow to remove music directories from the current libraries so that they are no longer loaded at the start of the application. The music folder will not be removed if the songs in it are being played right now | |
| Input | The music folder to remove | |
| Output | None | |

|  |  |  |
| --- | --- | --- |
| Name | FR#4 | Allow to sort the songs of the playlist by different criteria |
| Summary | The program allows you to sort the playlist by criteria such as: title, name of the mp3 file, duration, name of the artist, album, genre and size of the mp3 file | |
| Input | The sorting criterion | |
| Output | The current playlist has been sorted according to the criterion | |

|  |  |
| --- | --- |
| Nombre: | R1. Cargar imágenes de directorios escogidos por el usuario |
| Descripción: | El programa permite cargar imágenes personalizadas en el canvas |
| Entradas: |  |
| Salidas: |  |

|  |  |
| --- | --- |
| Nombre: | R2. Guardar los cambios del canvas como imagen en un directorio escogido por el usuario |
| Descripción: | Se toma un pantallazo de lo hecho en el canvas, y se le pide al usuario que escoja el lugar donde desea guardar la imagen |
| Entradas: | La ruta especificada por el usuario |
| Salidas: | Se guarda la imagen en un formato elegido por el usuario |

|  |  |
| --- | --- |
| Nombre: | R3. Permitir elegir diferentes colores y formas de lápiz para pintar en la pantalla |
| Descripción: | El usuario puede elegir en una paleta de colores el color deseado para dibujar en la pantalla |
| Entradas: | Color deseado |
| Salidas: |  |

|  |  |
| --- | --- |
| Nombre: | R4. Cargar figuras random |
| Descripción: | Se escoge de un árbol binario una figura al azar para ser añadida al canvas |
| Entradas: |  |
| Salidas: | La figura es añadida al canvas |

|  |  |
| --- | --- |
| Nombre: | R5. Buscar figura |
| Descripción: | Se carga una figura especificada por el usuario |
| Entradas: | Nombre de la figura |
| Salidas: | La figura se pinta en el canvas |

**Non-functional requirements**

|  |  |
| --- | --- |
| ID | Description |
| NFR#1 | Create the graphic user interface using JavaFX |
| NFR#2 | Save information from music folders so that the program is persistent |

**Traceability**

|  |  |  |  |
| --- | --- | --- | --- |
| ID | Functional requirement | Method | Class |
| FR#1 | Add music libraries |  |  |
| FR#2 | Play mp3 audio files |  |  |
| FR#3 | Remove directories from current libraries |  |  |
| FR#4 | Allow to sort the songs of the playlist by different criteria |  |  |

## **Unitary Tests Design**

(Scenarios Setting)

|  |  |  |
| --- | --- | --- |
| Name | Class | Scenario |
| setupScenario1 | Song | Empty |
| setupScenario1 | MusicFolder | Empty |
| setupScenario2 | MusicFolder | :Song  -root  :MusicFolder  title = “title5”;  artist = “author2”;  album = “album3”  genre = “genre3”;  size = 1.527223;  songPath = “music/bensound-badass.mp3”  fileName = “bensound-badass.mp3”  image = \*;  folder = new File("music");    -right  -left  :Song  :Song  title = “title6”;  artist = “author1”;  album = “album3”  genre = “genre2”;  size = 1.481874;  songPath = “music/bensound-happyrock.mp3”  fileName = “bensound-happyrock.mp3”  image = \*;  title = “title1”;  artist = “author2”;  album = “album1”  genre = “genre3”;  size = 1.467246;  songPath = “music/bensound- jazzyfrenchy.mp3”  fileName = “bensound- jazzyfrenchy.mp3”  image = \*;  -right  -right  :Song  :Song  title = “title7”;  artist = “author3”;  album = “album1”  genre = “genre2”;  size = 1.542217;  songPath = “music/bensound- pianomoment.mp3”  fileName = “bensound- pianomoment.mp3”  image = \*;  title = “title2”;  artist = “author1”;  album = “album2”  genre = “genre3”;  size = 4.349086;  songPath = “music/bensound- summer.mp3”  fileName = “bensound- summer.mp3”  image = \*;  -right  :Song  title = “title3”;  artist = “author3”;  album = “album2”  genre = “genre1”;  size = 1.257691;  songPath = “music/bensound-clearday.mp3”  fileName = “bensound-clearday.mp3”  image = \*;  -right  :Song  title = “title4”;  artist = “author2”;  album = “album3”  genre = “genre1”;  size = 2.050194;  songPath = “music/bensound-ukele.mp3”  fileName = “bensound-ukele.mp3”  image = \*; |
| setupStage1() | ImageOnListTest | Se instancia un nuevo objeto ImageOnList con valor de 10 |
| setupScenary2() | ImageOnListTest | se crea una nueva lista de la siguiente manera.  Objeto1:   * next = Objeto2   Objeto2:   * value = 30 * next = Objeto3 * previous = objeto1   Objeto3:   * value = 4 * next = Objeto4 * previous = objeto2   Objeto4:   * value = 14 * next = null * previous = objeto2 |
| setupStage1() | ImageOnTreeTest | Se instancia una raíz ImageOnTree con valor de 50 |
| setupScenary2() | ImageOnTreeTest | Se instancian los siguientes objetos:   * left1 como un nuevo Objeto tipo ImageOnTree, con valor de 30 * left11 como un nuevo Objeto tipo ImageOnTree, con valor de 20 * right12 como un nuevo Objeto tipo ImageOnTree, con valor de 40 * right2 como un nuevo Objeto tipo ImageOnTree, con valor de 60 * right22 como un nuevo Objeto tipo ImageOnTree, con valor de 70   Se agregan a el árbol binario de la siguiente manera:  left1 a la izquierda del root, right2 a la derecha del root, right22 a la derecha de right2, left11 a la izquierda de left1, y right12 a la derecha de left1. |
| setupStage1() | ImageTest | Se instancia un nuevo objeto tipo Image con valor de 3. |
| setupStage() | ListOfImages |  |
| setupScenary1() | ListOfImages | Se instancia un nuevo objeto tipo ListOfImages |
| setupScenary2() | ListOfImages | El mismo que el setupScenary1().  Se agregan 6 nuevos objetos a la lista con los siguientes valores y orden:   1. 0 2. 3 3. 6 4. 2 5. 5 6. 4 |
| setupScenary1 | TreeOfImages | Vacío |
| setupScenary2 | TreeOfImages | Se inicializa un objeto del tipo TreeOfImages pero con su atributo <root> nulo. |
| setupScenary3 | TreeOfImages | Se inicializa la relación con la clase a probar.  Se añaden 7 nodos al árbol con los siguientes valores:  5, 2, 4, 1, 7, 6, 8 |

**Unitary Tests Design**

(Tests Development)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies a Song be created successfully when a valid path and audio format are delivered as parameters in the constructor. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| Song | Song(constructor) | setupScenario1 | fileName = "bensound-happyrock.mp3";  songPath = "music"+File.separator+fileName; | The song was created successfully. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies a Song does not be created successfully when an invalid path and valid audio format are delivered as parameters in the constructor. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| Song | Song(constructor) | setupScenario1 | fileName = "idonotexist.mp3";  songPath = fileName; | The song wasn’t created successfully due to "idonotexist.mp3" is not a valid path. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies a Song does not be created successfully when a valid path and invalid audio format are delivered as parameters in the constructor. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| Song | Song(constructor) | setupScenario1 | fileName = "testfile.txt";  songPath = "data"+File.separator+fileName; | The song wasn’t created successfully due to testfile.txt is not a valid audio format. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies a MusicFolder does not be created successfully when a non-existent folder path is given as parameter in the constructor. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | MusicFolder  (constructor) | setupScenario1 | folderName = "idonotexist"; | The music folder wasn’t created successfully due to "idonotexist" is a folder that doesn’t exist. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies a MusicFolder be created successfully when a valid folder path with mp3 files is given as parameter in the constructor. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | MusicFolder  (constructor) | setupScenario1 | folderName = "music"; | The music folder was created successfully. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies a MusicFolder does not be created successfully when a valid folder path without mp3 files is given as parameter in the constructor. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | MusicFolder  (constructor) | setupScenario1 | folderName = "test"+File.separator+"model"; | The music folder wasn’t created successfully due to test->model is a folder that doesn’t have mp3 files inside. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies if the method inorder() from the Song BST returns a sorted songs array. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | inorder() | setupScenario2 | None | The returned list of songs is in order. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies if the method sortSongsByTitle() returns a songs array sorted by title. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | sortSongsByTitle() | setupScenario2 | tc = new TitleComparator(); | The list is sorted by title. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies if the method sortSongsByAlbum() returns a songs array sorted by album. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | sortSongsByAlbum() | setupScenario2 | ac = new AlbumComparator(); | The list is sorted by album. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies if the method sortSongsBySize() returns a songs array sorted by size. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | sortSongsBySize() | setupScenario2 | sc = new SizeComparator(); | The list is sorted by size. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies if the method sortSongsByGenre() returns a songs array sorted by genre. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | sortSongsByGenre() | setupScenario2 | gc = new GenreComparator(); | The list is sorted by genre. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Objective: This test verifies if the method sortSongsByArtist() returns a songs array sorted by artist. | | | | |
| Class | **Method** | **Scenario** | **Input** | **Result** |
| MusicFolder | sortSongsByArtist() | setupScenario2 | arc = new ArtistComparator(); | The list is sorted by artist. |