
Text2SpeechEditor

Sprint No 2 Report

Quarantine Creations
Panagiotidis Diktampanis Aristides, 2323

VERSIONS HISTORY

Date	Version	Description	Author
20/5/2020	2 (Final)	We 'll be detailing the inner workings of Text2SpeechEditor's final version	Panagiotidis Diktampanis Aristides

1 Introduction

This document provides information concerning the 2nd and final sprint of the project.

1.1 Document Structure

The rest of this document is structured as follows. Section 2 describes out Scrum team and specifies this Sprint's backlog. Section 3 specifies the main design concepts for this release of the project.

2 Scrum team and Sprint Backlog

2.1 Scrum team

Product Owner	Apostolos Zarras
Scrum Master	Panagiotidis Diktampanis Aristides (2323)
Development Team	Panagiotidis Diktampanis Aristides (2323)

2.2 Sprint Backlog

[US-1] The user can create a new empty document by giving its title and author.

The application automatically records the creation date. The application also checks for unsaved changes in the current document and prompts the user to Save.

[US-2] The user can edit the contents of the document via the application's user interface.

[US-3] The user can save the contents of the document to disk by providing a particular filename.

The application automatically records the save date.

[US-4] The user can open the contents of an existing document from disk by providing a particular file path or by browsing the file system folders. The application checks for unsaved changes in the current document and prompts the user to Save.

[US-5] The user can transform the contents of the document to speech.

[US-6] The user can select a line and transform it to speech.

[US-7] The user can transform the contents of the document to speech in reverse, i.e. play the last word of the last line first and so on.

[US-8] The user can select a line and transform it to speech in reverse, i.e. play the last word first and so on.

[US-9] The user can encode the contents of the document and then transform them to speech.

[US-10] The user can select a line, encode it and transform it to speech.

[US-11] The user can tune the text encoding technique. In particular the application can support the following encoding strategies:

- **AtBash:** The AtBash cipher is formed by taking the alphabet and mapping it to its reverse so that the first letter becomes the last letter, the second letter becomes the second to last letter and so on.
- **Rot-13:** Rot-13 is a letter substitution cipher that replaces a letter with the 13th alphabet letter after it. Rot-13 is a special case of the Caesar cipher, which was developed in ancient Rome.

[US-12] The user can tune the audio parameters, i.e., the volume, the speech rate and the pitch.

[US-13] The user can store a sequence of actions/commands (e.g. open file, edit contents, play contents, play line, save file) that he/she has performed in main memory and re-execute them multiple times.

Extra

[US-14] The user can perform basic document editing operations like Cut, Copy, Paste and Delete from the application menu.

[US-15] The user can exit the current document either from the application menu or from the applications Close button. The application automatically checks for unsaved changes and alerts the user providing him/her a Save/Don't Save/Cancel operation.

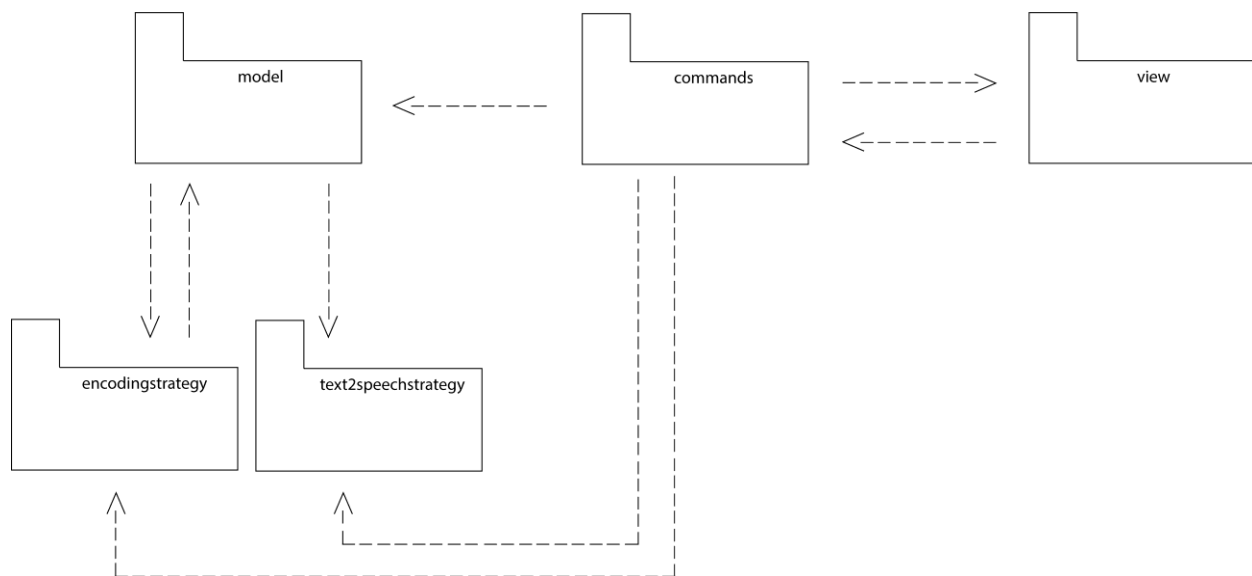
[US-16] While the document is being read from the application, the user has the choice to stop the audio from the application menu.

Note

I failed to implement the Junit tests, thus no description of them is available.

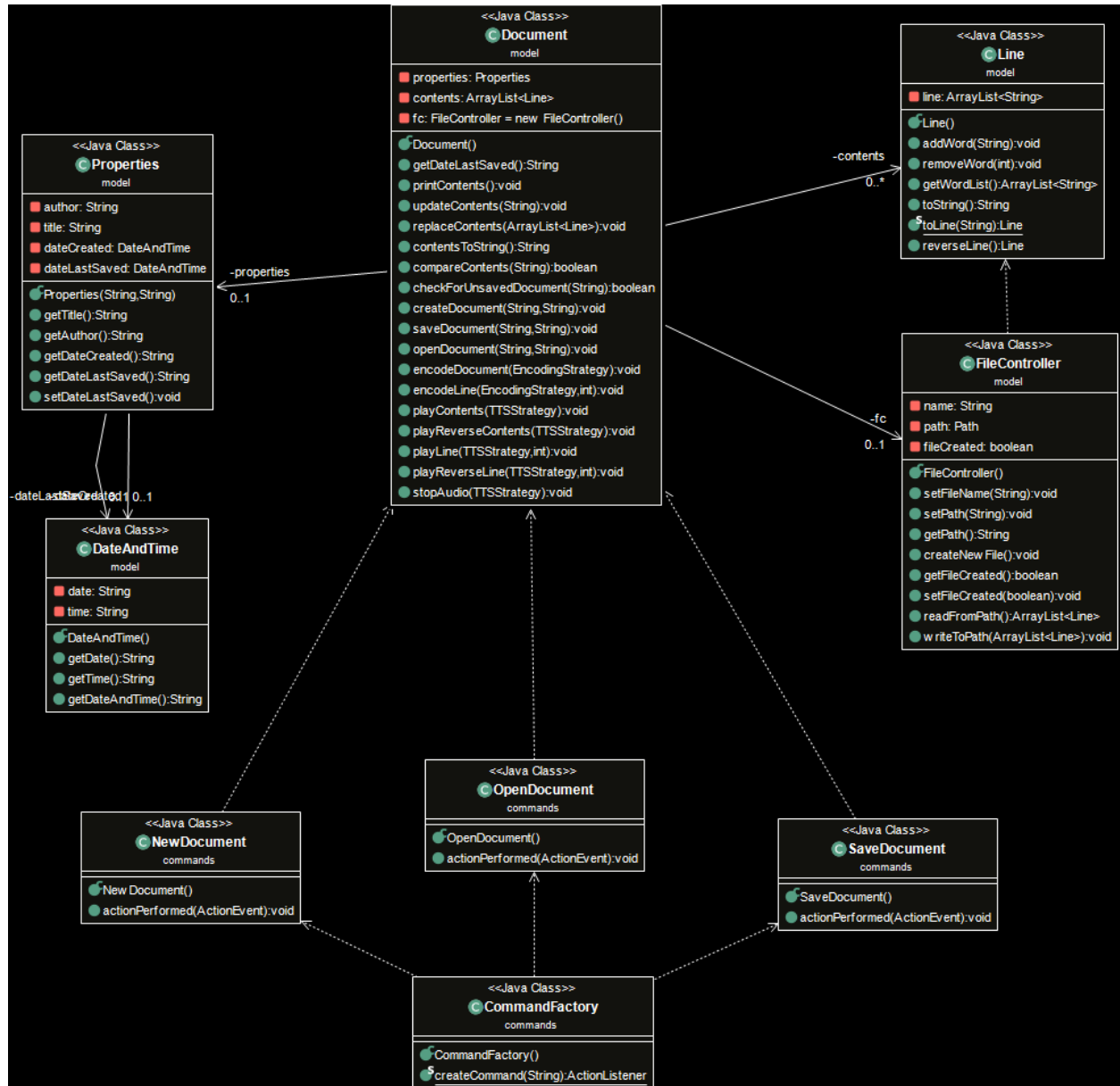
3 Design

3.1 Architecture



3.2 Design

Package: model



Class Name: Document	
Responsibilities: <ul style="list-style-type: none"> ▪ Represents application's main unit. Every editor's action is reflected as a change to this unit, namely a document. ▪ Holds document's building blocks, properties and contents ▪ Is the only class with direct access to document's data ▪ Creates a new document by initializing its Title and Author. ▪ Saves document's contents to a file (given the file path) ▪ Opens a document by initializing the contents (read from a file) ▪ Updates the contents of the document (or of a single line inside the contents) with encrypted text ▪ Provides the contents (or a line inside those contents) for audio transformation (normal or reversed) 	Collaborations: <ul style="list-style-type: none"> ▪ Line ▪ FileController ▪ Properties

Class Name: Line	
Responsibilities: <ul style="list-style-type: none"> ▪ Represents each line of the editors text as an ArrayList of strings (each element of the ArrayList represents a word) ▪ Converts a string to a Line object ▪ Converts a Line object to String ▪ Reverses a given Line 	Collaborations: <ul style="list-style-type: none"> ▪ Document ▪ FileController

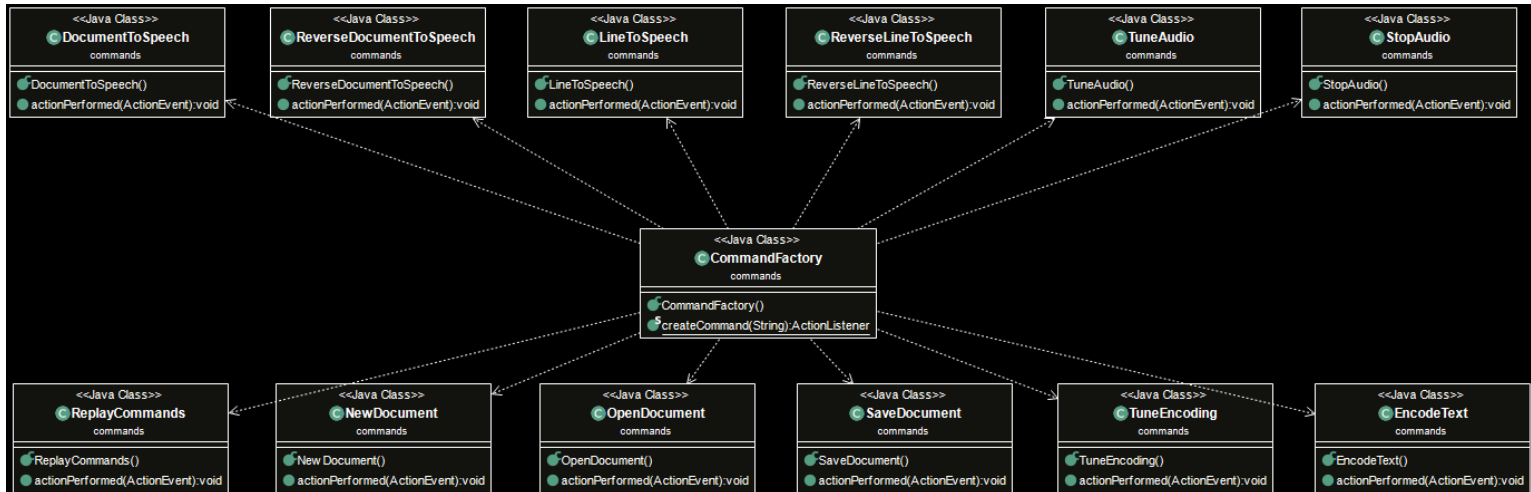
Class Name: Properties	
Responsibilities: <ul style="list-style-type: none"> ▪ Defines Documents properties as a set comprised of the Author, the Title, the Date it was created and the Date it was last saved. ▪ Stores Author, Title, Date created & Date last saved for a given Document ▪ Retrieves Author, Title, Date created & Date last saved for a given Document 	Collaborations: <ul style="list-style-type: none"> ▪ Document ▪ DateAndTime

Class Name: DateAndTime	
Responsibilities: <ul style="list-style-type: none"> ▪ Calculates current date and time ▪ Formats date and time as Strings ▪ Stores current date and time ▪ Fetches current date and time 	Collaborations: <ul style="list-style-type: none"> ▪ Properties

Class Name: FileController	
Responsibilities: <ul style="list-style-type: none"> ▪ Holds info (name and path) for a file (as in .txt) ▪ Creates a new file on a given path ▪ Reads from a file in a given path ▪ Writes to a file in a given path 	Collaborations: <ul style="list-style-type: none"> ▪ Line ▪ Document

Package: commands

Based on the Parameterized Factory and Command Design Patterns



Class Name: CommandsFactory

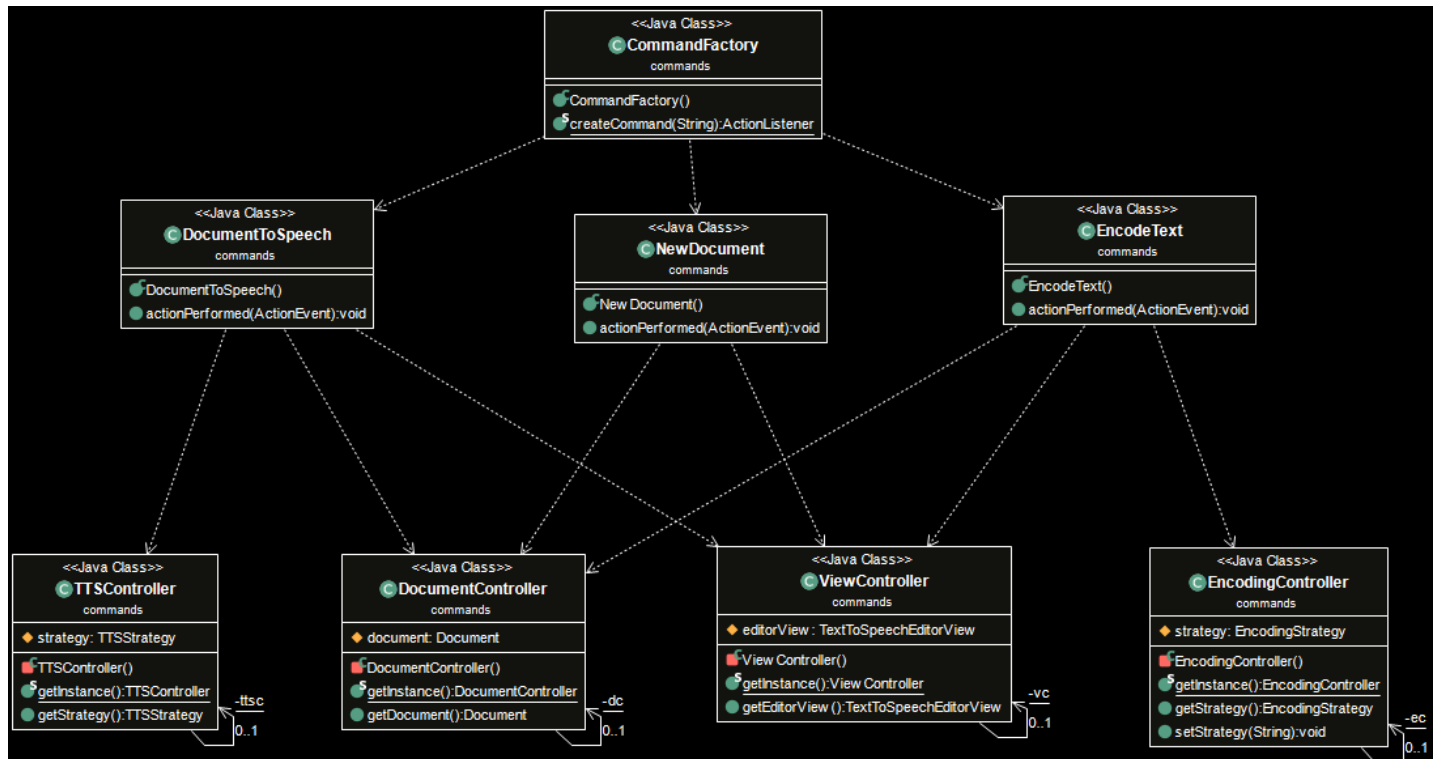
Responsibilities:

- Decides which ActionListener object to create based on the parameter (which in turn is defined by user's action)

Collaborations:

- TextToSpeechEditorView
- NewDocument
- SaveDocument
- OpenDocument
- TuneEncoding
- EncodeText
- DocumentToSpeech
- ReverseDocumentToSpeech
- LineToSpeech
- ReverseLineToSpeech
- TuneAudio
- StopAudio
- ReplayCommands

The Singleton Design Pattern



Class Name: DocumentController

Responsibilities:

- Singleton class makes sure we are referring to the same Document Object

Collaborations:

- Document

Class Name: ViewController

Responsibilities:

- Singleton class makes sure we are referring to the same TextToSpeechEditorView object

Collaborations:

- TextToSpeechEditorView

Class Name: EncodingController

Responsibilities:

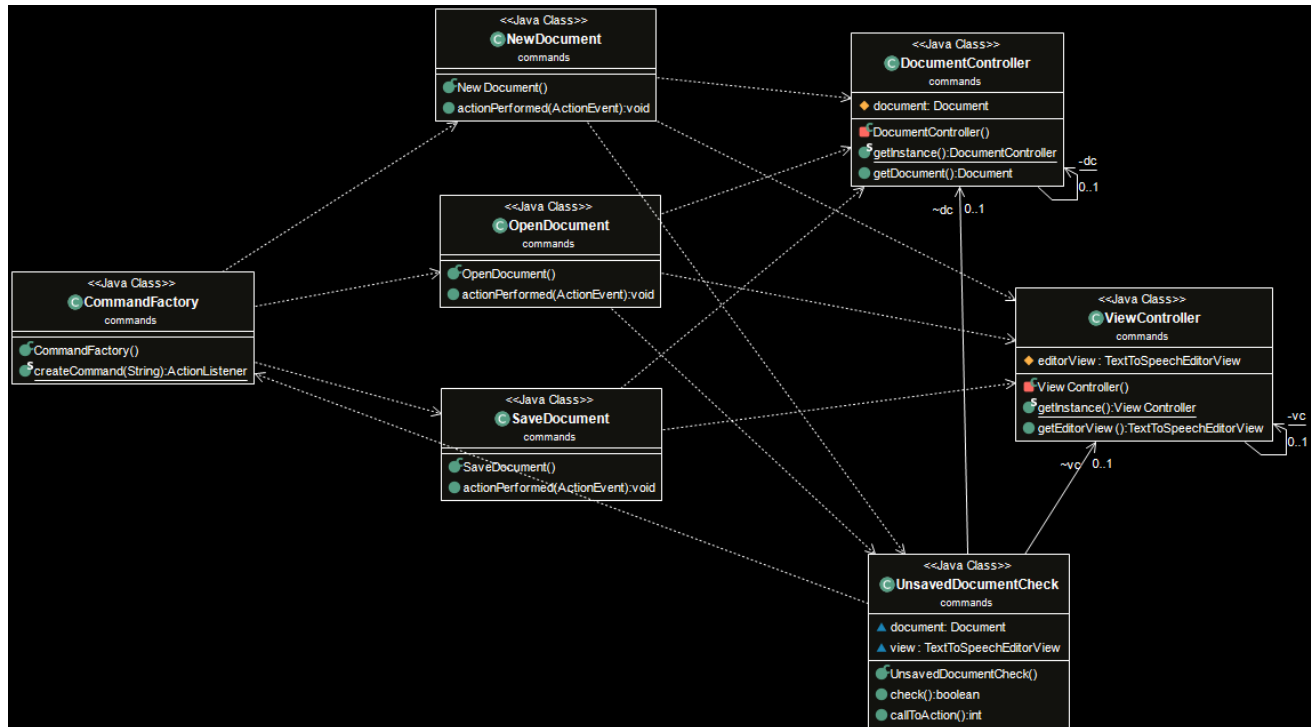
- Singleton class makes sure we are referring to the same EncodingStrategy object

Collaborations:

- EncodingStrategy

Class Name: TTSTController	
Responsibilities:	Collaborations:
<ul style="list-style-type: none"> Singleton class makes sure we are referring to the same TTSTStrategy Object 	<ul style="list-style-type: none"> TTSTStrategy

The File type Commands



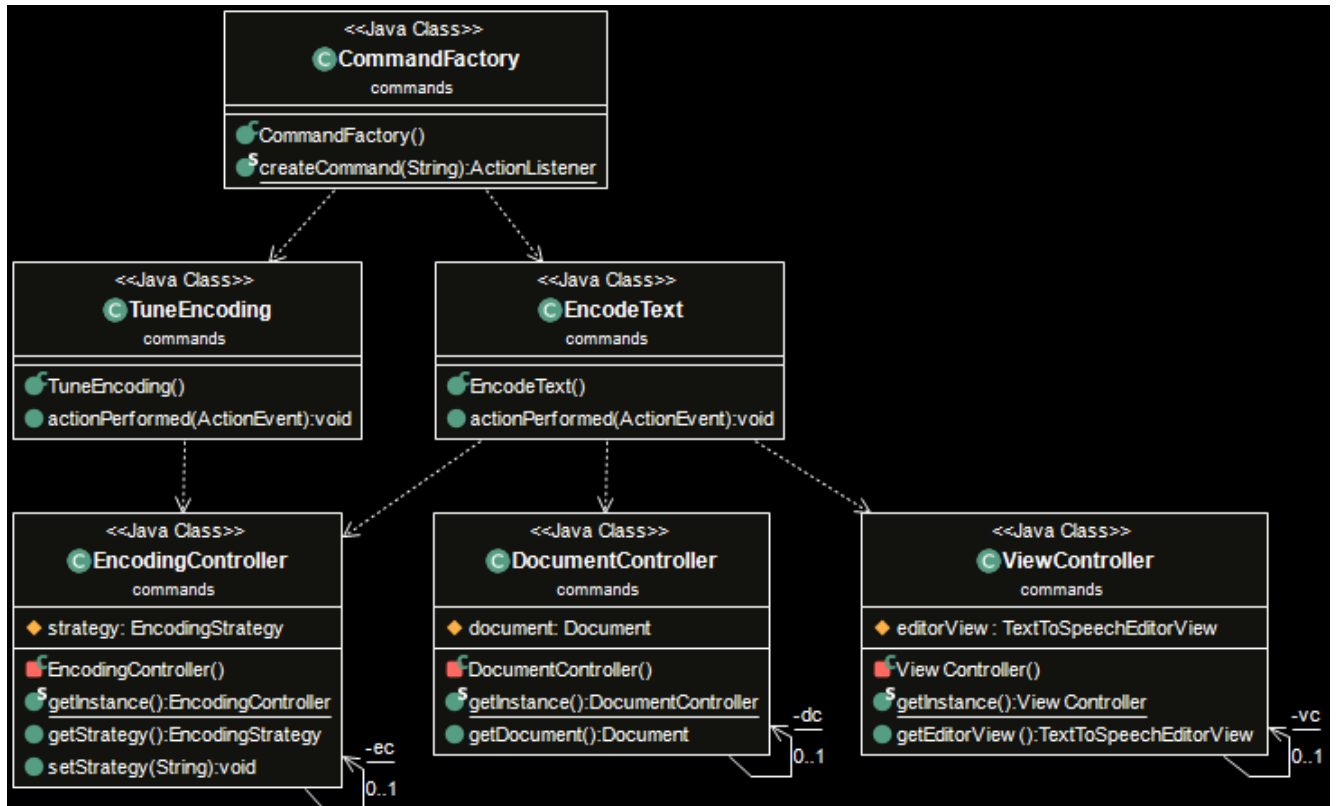
Class Name: NewDocument	
Responsibilities:	Collaborations:
<ul style="list-style-type: none"> Checks for unsaved changes in the current document If there are unsaved changes calls the user to action Asks the user for the Title and the Author of the new Document Calls for the creation of the new document 	<ul style="list-style-type: none"> DocumentController Document ViewController TextToSpeechEditorView ReplayManager

Class Name: SaveDocument	
Responsibilities: <ul style="list-style-type: none"> ▪ Presents the user with a FileChooser to select the file destination ▪ Parses the file destination to String ▪ Parses editor's text area to String ▪ Calls for the update of the Document's contents ▪ Calls for the Document's saving in the chosen file path 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ ViewController ▪ TextToSpeechEditorView ▪ ReplayManager

Class Name: OpenDocument	
Responsibilities: <ul style="list-style-type: none"> ▪ Checks for unsaved changes in the current document ▪ If there are unsaved changes calls the user to action ▪ Presents the user with a FileChooser to select the file destination ▪ Parses the file destination to String ▪ Updates editor's text area with the new contents 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ ViewController ▪ TextToSpeechEditorView ▪ ReplayManager

Class Name: UnsavedDocumentCheck	
Responsibilities: <ul style="list-style-type: none"> ▪ Checks for differences between editor's text and current Document contents ▪ If such differences exist, calls the user to action by providing a Save/Don't Save/Cancel dialog 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ ViewController ▪ TextToSpeechEditorView

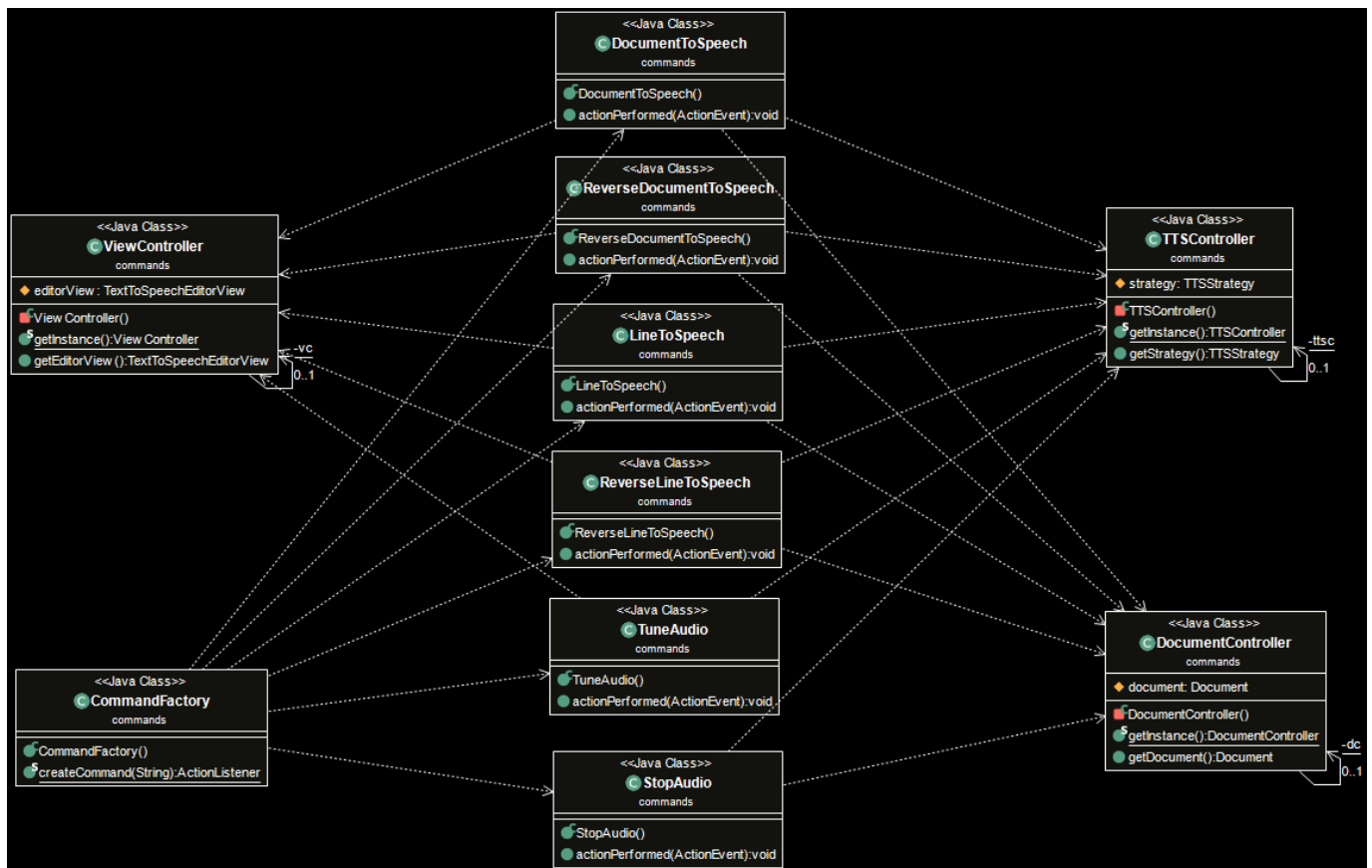
The Encode type Commands



Class Name: EncodeText	
Responsibilities: <ul style="list-style-type: none"> Gets user's selection of editor's text Calls for selected text encoding If the user hasn't selected anything, calls for the encoding of the whole document 	Collaborations: <ul style="list-style-type: none"> DocumentController Document TTSTController TTSSStrategy View Controller TextToSpeechEditorView ReplayManager

Class Name: TuneEncoding	
Responsibilities:	Collaborations:
<ul style="list-style-type: none"> Sets the current encoding technique based on the user's choice (taken from application menu) 	<ul style="list-style-type: none"> EncodingController EncodingStrategy

The Text to Speech type Commands



Class Name: DocumentToSpeech	
Responsibilities: <ul style="list-style-type: none"> ▪ Updates the contents of the document with editor's current text ▪ Calls for contents conversion to speech 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ TTSController ▪ TTSStrategy ▪ View Controller ▪ TextToSpeechEditorView ▪ ReplayManager

Class Name: ReverseDocumentToSpeech	
Responsibilities: <ul style="list-style-type: none"> ▪ Updates the contents of the document with editor's current text ▪ Calls for contents conversion to speech in reverse 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ TTSController ▪ TTSStrategy ▪ View Controller ▪ TextToSpeechEditorView ▪ ReplayManager

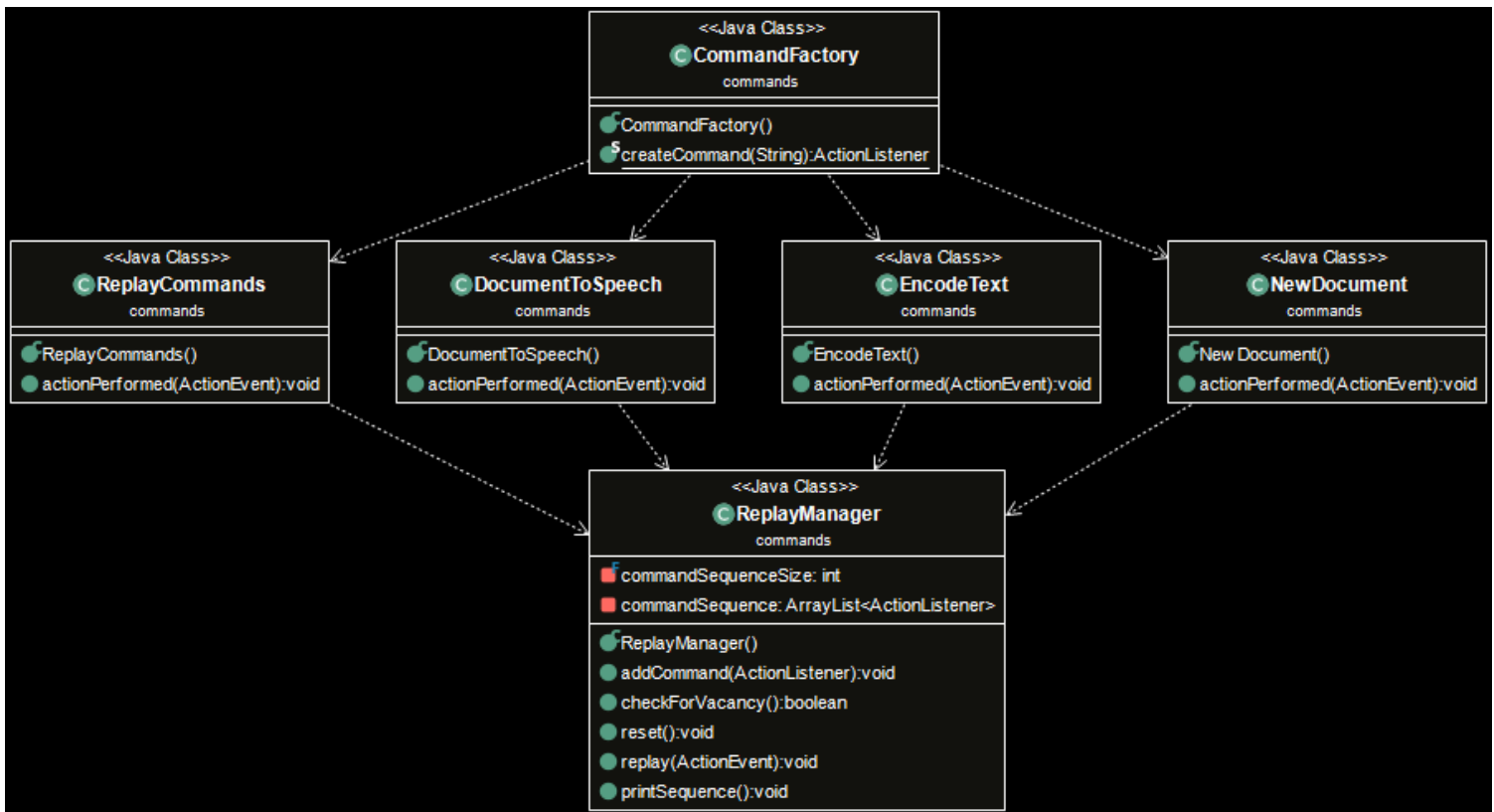
Class Name: LineToSpeech	
Responsibilities: <ul style="list-style-type: none"> ▪ Retrieves the selected line in editor's text ▪ Updates the contents of the document with editor's current text ▪ Calls for the conversion to speech of the selected line 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ TTSController ▪ TTSStrategy ▪ View Controller ▪ TextToSpeechEditorView ▪ ReplayManager

Class Name: ReverseLineToSpeech	
Responsibilities: <ul style="list-style-type: none"> ▪ Retrieves the selected line in editor's text ▪ Updates the contents of the document with editor's current text ▪ Calls for the conversion to speech of the selected line in reverse 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ TTSController ▪ TTSStrategy ▪ View Controller ▪ TextToSpeechEditorView ▪ ReplayManager

Class Name: TuneAudio	
Responsibilities: <ul style="list-style-type: none"> ▪ Set the speech volume level to a new value ▪ Sets the speech pitch level to a new value ▪ Sets the speech rate to a new value 	Collaborations: <ul style="list-style-type: none"> ▪ TTSController ▪ TTSStrategy ▪ View Controller ▪ TextToSpeechEditorView

Class Name: StopAudio	
Responsibilities: <ul style="list-style-type: none"> ▪ Calls for speech playback to stop 	Collaborations: <ul style="list-style-type: none"> ▪ DocumentController ▪ Document ▪ TTSController ▪ TTSStrategy ▪ ReplayManager

The Replay Command

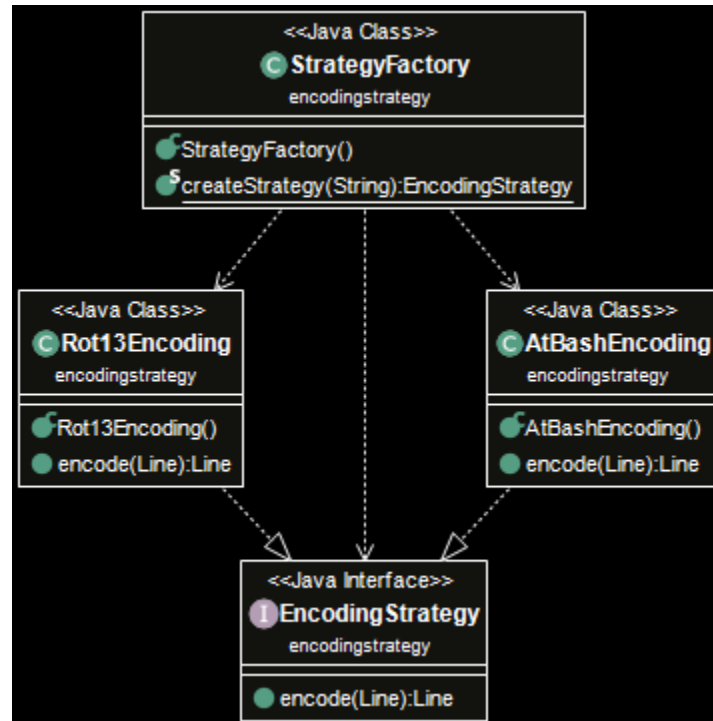


Class Name: ReplayManager	
Responsibilities: <ul style="list-style-type: none"> ▪ Adds every command executed by the user to a list (in order of execution) ▪ Re-executes the stored actions ▪ Resets (empties) the list 	Collaborations: <ul style="list-style-type: none"> ▪ ReplayCommnds ▪ NewDocument ▪ OpenDocument ▪ SaveDocument ▪ DocumentToSpeech ▪ ReverseDocumentToSpeech ▪ LineToSpeech ▪ ReverseLineToSpeech ▪ StopAudio ▪ EncodeText

Class Name: ReplayCommands	
Responsibilities:	Collaborations:
<ul style="list-style-type: none"> Executes the replay command 	<ul style="list-style-type: none"> ReplayManager

Package: encodingstrategy

Based on the Strategy and Parameterized Factory Design Pattern



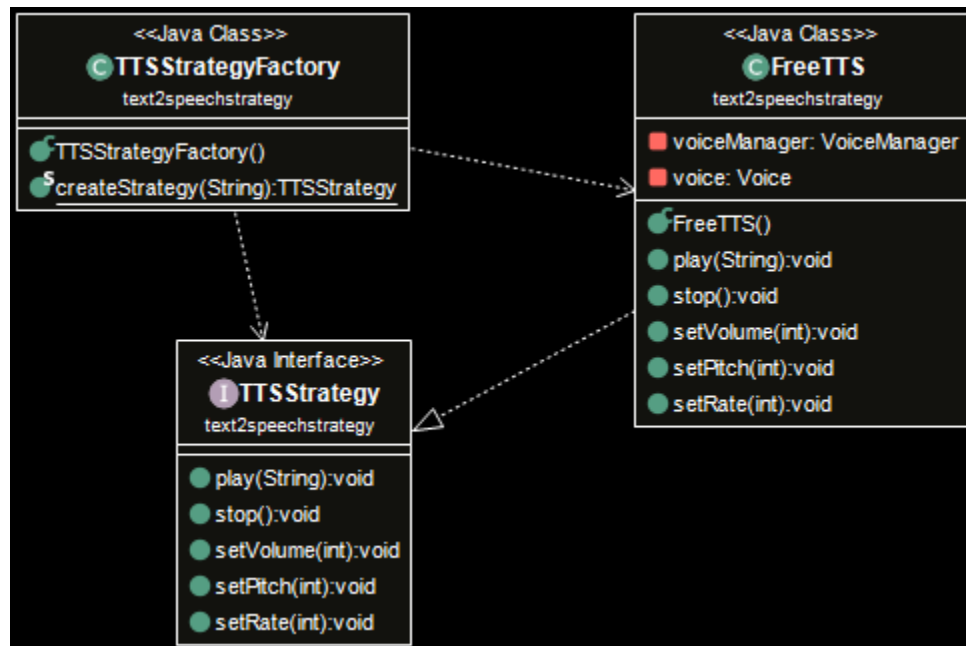
Class Name: StrategyFactory	
Responsibilities:	Collaborations:
<ul style="list-style-type: none"> Decides which <code>EncodingStrategy</code> object to create based on user's choice 	<ul style="list-style-type: none"> <code>Rot13Encoding</code> <code>AtBashEncoding</code>

Class Name: Rot13Encoding	
Responsibilities: <ul style="list-style-type: none"> Encodes a given Line object with Rot13 technique Returns the encoded Line object 	Collaborations: <ul style="list-style-type: none"> Line

Class Name: AtBashEncoding	
Responsibilities: <ul style="list-style-type: none"> Encodes a given Line object with AtBash technique Returns the encoded Line object 	Collaborations: <ul style="list-style-type: none"> Line

Package: text2speechstrategy





















Based on the Adapter and Parameterized Factory Design Patterns



Class Name: FreeTTS	
Responsibilities: <ul style="list-style-type: none"> ▪ Sets up the voice with which the document will be read ▪ Converts a given String to audio ▪ Stops audio playback ▪ Sets audio's volume level ▪ Sets audio's pitch level ▪ Sets the rate at which the String will be played 	Collaborations: <ul style="list-style-type: none"> ▪ com.sun.speech.freetts.Voice ▪ com.sun.speech.freetts.VoiceManager

Class Name: TTSStrategyFactory	
Responsibilities: <ul style="list-style-type: none"> ▪ Decides which TTSStrategy object to create based on user's choice 	Collaborations: <ul style="list-style-type: none"> ▪ FreeTTS

Package: view

<<Java Class>>	
 TextToSpeechEditorView	
view	
	frame: JFrame
	textArea: JTextArea
	separator: JSeparator
	currentLineIndex: int
	volumeLevel: int
	pitchLevel: int
	rateLevel: int
	TextToSpeechEditorView ()
	initialize():void
	findImage(String):ImageIcon
	resizeImage(ImageIcon,int,int):ImageIcon
	getFrame():JFrame
	getTextArea():String
	setTextArea(String):void
	getTitleAndAuthor():String[]
	show UnsavedDocumentWarning():int
	updateLineIndex(int):void
	getCurrentLine():int
	getSelectionStart():int
	getSelectionEnd():int
	getSelection():String
	updateVolume(int):void
	getVolume():int
	updatePitch(int):void
	getPitch():int
	updateRate(int):void
	getRate():int

Class Name: TextToSpeechEditorView	
Responsibilities: <ul style="list-style-type: none"> ▪ Sets up the application UI ▪ Connects user's actions with corresponding ActionListeners ▪ Performs Cut operation on selected text ▪ Performs Copy operation on selected text ▪ Performs Paste operation of copied text ▪ Performs Delete operation of selected text ▪ Retrieves editor's text ▪ Sets editor's text ▪ Provides dialog box for the case of an unsaved document ▪ Provides dialog box for Title and Author input 	Collaborations: <ul style="list-style-type: none"> ▪ CommandFactory ▪ UnsavedDocumentCheck

Complete UMLs of view, commands and model interactions

