IMAGI- Child Friendly Programming Language

Reference Manual

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Introduction

Project Motivation

With the technology industry developing at a rapid pace, the need for more programmers increases everyday. Little options exist to introduce programming to kids successfully, this is why our team decided to attack this need. By creating a new programming language focused and designed for children we will be able to encourage and motivate students at a young age to pursue STEM related careers but specifically, computer and software engineering majors. After experiencing IMAGI, kids will be able to understand the basics of programming, learn to have fun with it and be prepared to move to a more standard programming language like python or java in the future.

Project Concept

IMAGI is a child friendly programming language developed with the goal of introducing programming to kids in a new and interesting way from a very young age. Lines of code alone will surely have a hard time arousing any children at such a young age, this is the reason why IMAGI's programming experience is aided by a simple graphical user interface which will allow the programmer to interact with different characters and scenes, and create simple storylines by writing code. One of the challenges of kids as our scope is that this language must try to develop the programming instincts in the simplest way possible, avoiding complicated syntax, overcrowding of commands and ambiguity. Using commonly known words and making the programming language straightforward, as easy as talking, is the focus.

Requirements

The tools and requirements needed to be able to use our programming language are kept to the minimum possible so that it is easy to use in any of the most popular operating systems.It is required that the user has Python v2.7.11, Qt4 and PyQt4 installed to make sure the language can be run from the command prompt.

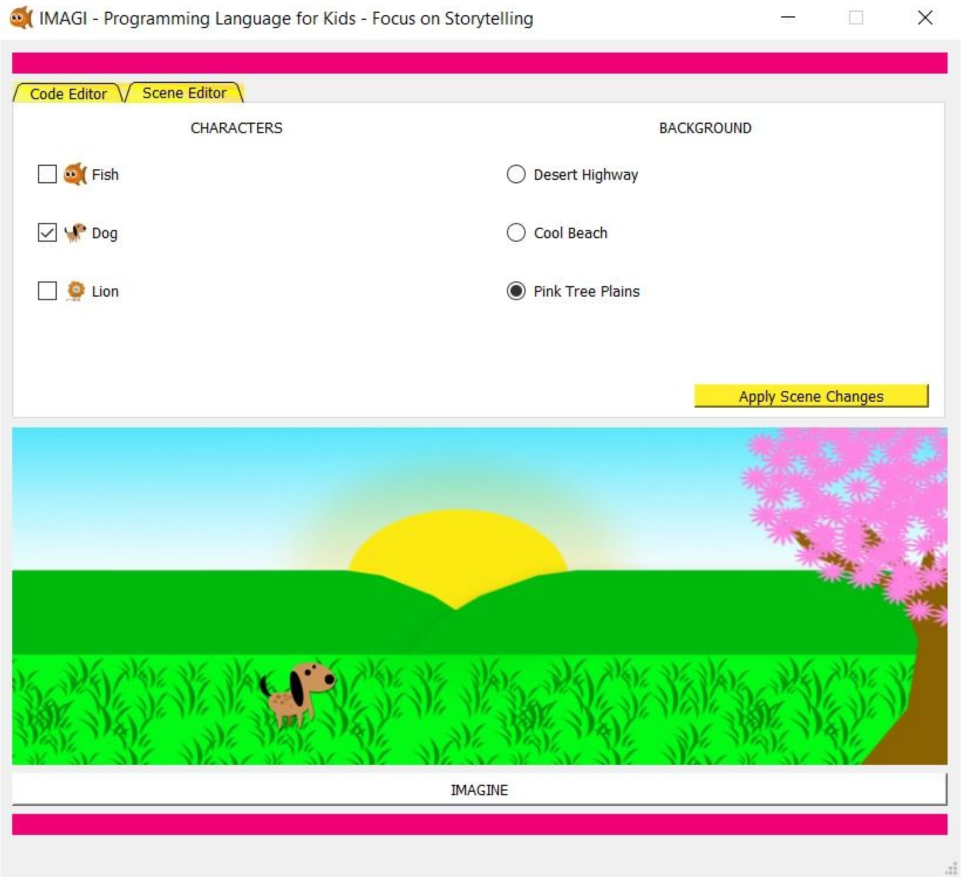
Skills Required

IMAGI is a child friendly programming language thus no previous experience programming is necessary. IMAGI is designed to develop various skills on children, such as: programming, storytelling, spatial perception and imagination.

LETS

IMAGI !!!

Scene Editor Tab



IMAGI - Programming Language for Kids - Focus on Storytelling
Code Editor
Scene Editor
Apply Scene Changes
IMAGINE

CHARACTERS

☐ Fish

☑ Dog

☐ Lion

BACKGROUND

○ Desert Highway

○ Cool Beach

● Pink Tree Plains

On this tab can be selected the scene by clicking one of the 3 options presented on the background section. The scenes available are:

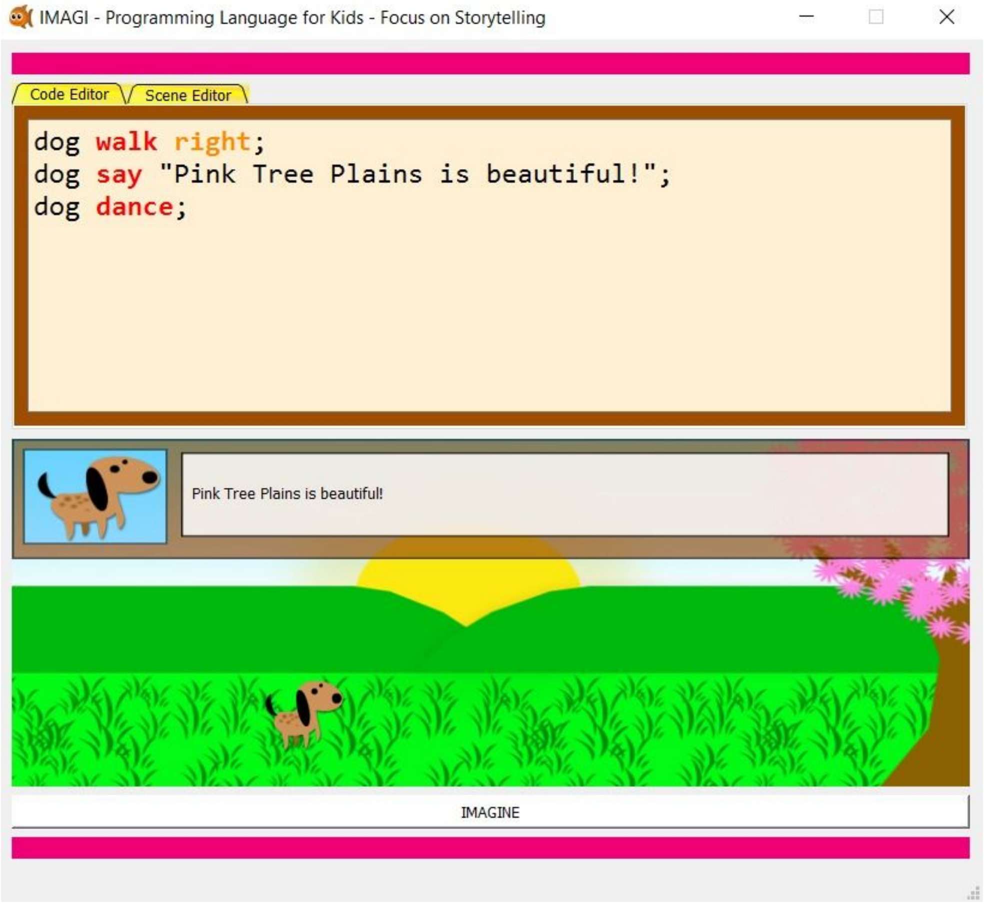
- Desert Highway
- Cool Beach
- Pink Tree Plains

The character selection is on the left side below Characters. All characters can be used at the same time by selecting each one or you just can choose the one that you like the most. The available characters are:

- Fish
- Dog
- Lion

After selecting the options you want to apply to your scene just click the “Apply Scene Changes” to save them .

Code Editor Tab



IMAGI - Programming Language for Kids - Focus on Storytelling
Code Editor
Scene Editor

```
dog walk right;
dog say "Pink Tree Plains is beautiful!";
dog dance;
```

Pink Tree Plains is beautiful!

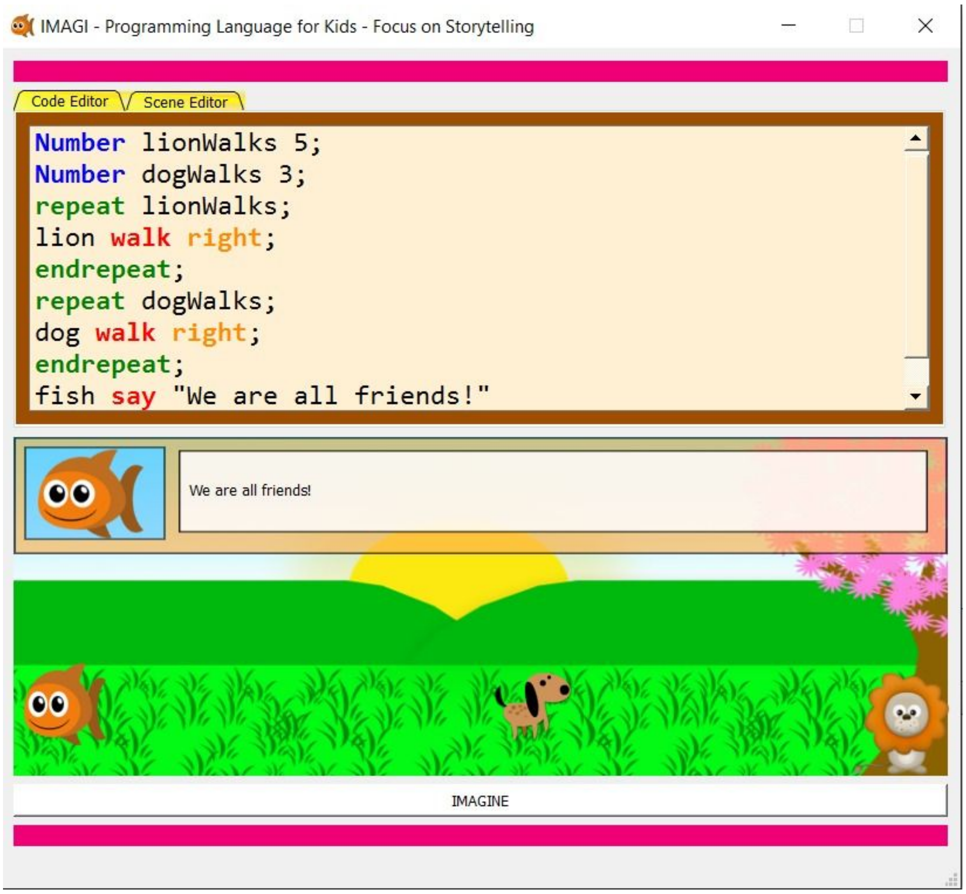
On the code editor tab is where all the magic occurs. It is located on the top of the window. On this tab you can write your program lines, just let your imagination flow. The code written can be tested on any moment by pressing the “IMAGINE” button. The result will be displayed on the scene.

Copy paste the following lines depending the characters you are using for an preview:

```
fish say “Hello my name is Fish!”;
dog dance;
lion jump;
lion say “Roar”;
```

Then just click “IMAGINE” …….

Using Variables


IMAGI - Programming Language for Kids - Focus on Storytelling
Code Editor
Scene Editor
IMAGINE

```
Number lionWalks 5;
Number dogWalks 3;
repeat lionWalks;
lion walk right;
endrepeat;
repeat dogWalks;
dog walk right;
endrepeat;
fish say "We are all friends!"
```

We are all friends!

Using variables on IMAGI is very simple. There are only two types of variables on this language and they are:

- Number
- Word

To declare a variable you have to follow the following syntax:

VariableType varName Value;

An example of this can be see on the above image. The first two lines of the code declare two variables of type Number.

Name	Value
lionWalks	5

dogWalks 3

Example Wordtype: Word salute “Hello”;

Once that you have declared an variable, you would be able to use it later on code.

Commands Features

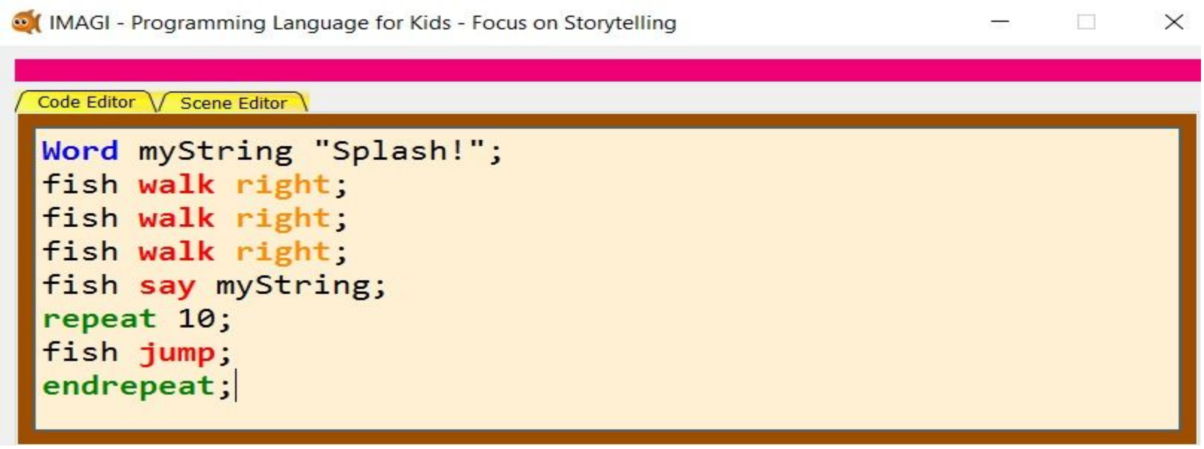
Commands/Tokens	Target	Number of Attributes	Attributes Description
jump	Character	N/A	No attributes needed.
walk	Character	1	Direction: left or right.
say	Character	1	Text to say: raw string or word type
domath	Character	3	Operator: +, -, * or / Number/s to add: can be a raw number or a number type described below.
dance	Character	N/A	No attributes needed
endrepeat	N/A	N/A	No attributes needed
grow	Character	N/A	No attributes needed
shrink	Character	N/A	No attributes needed
ask	Character	2	Text to prompt: raw string or word type Variable to store input: word or number type
repeat	N/A	1	Times to repeat, can be a raw number or an NumberType variable
run	Character	1	Direction: right or left
Word	N/A	2	Variable Name, raw string

Number	N/A	2	Variable Name, value

Commands Functions

jump: insert a jumping animation to the given target.
walk: insert a walking animation with the desired direction to the given target.
say: create a dialog box with the given message.
domath: resolve the given mathematical expression (add, subtract, multiply,divide)
dance: insert a dancing animation to the given target.
repeat: the lines between the repeat statement and endrepeat, will repeat given times.
endrepeat: ends a repeat loop.
grow: the target character will grow.
shrink: the target character will shrink.
ask: create a dialog box with the given question.
run: insert a running animation with the desired direction to the given target.
Word: create a variable of type word with the given string.
Number: create a variable of type with the given value.

Example of various commands


IMAGI - Programming Language for Kids - Focus on Storytelling
Code Editor
Scene Editor

```
Word myString "Splash!";
fish walk right;
fish walk right;
fish walk right;
fish say myString;
repeat 10;
fish jump;
endrepeat;
```