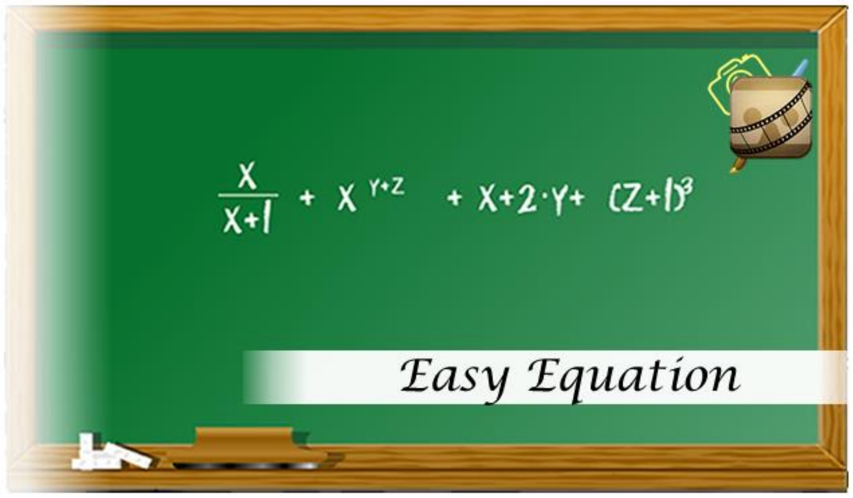
Simple Formula Generator



1. GENERAL INFORMATION

DATE OF DOCUMENT	29/06/2016
NAME OF THE PROJECT	Simple Formula Generator
AUTHOR	Michael Soler
UNITY VERSION	5.3.4.F1 PERSONAL
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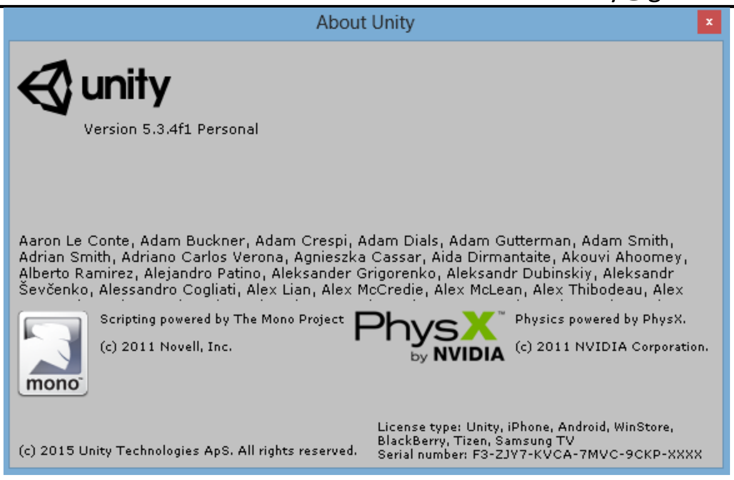
About Unity

unity
Version 5.3.4f1 Personal

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Scripting powered by The Mono Project
(c) 2011 Novell, Inc.

Physics powered by PhysX.
(c) 2011 NVIDIA Corporation.

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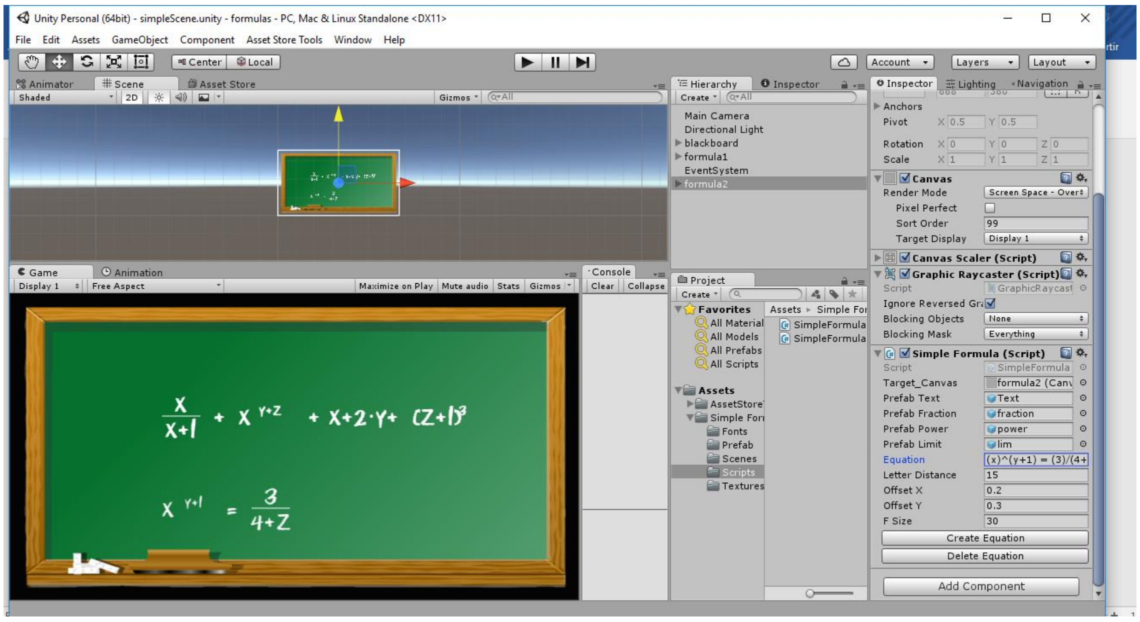
2. IMPORTING INFORMATION

This package works independently and there is no need to import any other package.


Unity Personal (64bit) - simpleScene.unity - formulas - PC, Mac & Linux Standalone <DX11>
File Edit Assets GameObject Component Asset Store Tools Window Help
Hierarchy
Main Camera
Directional Light
blackboard
formula1
EventSystem
formula2
Project
Favorites
Assets
Create Equation
Delete Equation
Add Component

```
Pivot            X 0.5   Y 0.5
Rotation         X 0     Y 0     Z 0
Scale            X 1     Y 1     Z 1
Canvas
Render Mode      Screen Space - Over
Pixel Perfect
Sort Order       99
Target Display   Display 1
Canvas Scaler (Script)
Graphic Raycaster (Script)
Script           GraphicRaycast
Ignore Reversed Gr ✓
Blocking Objects None
Blocking Mask    Everything
Simple Formula (Script)
Script           SimpleFormula
Target_Canvas    formula2 (Canv
Prefab Text      Text
Prefab Fraction  fraction
Prefab Power     power
Prefab Limit     lim
Equation         (x)^(y+1) = (3)/(4+
Letter Distance  15
Offset X         0.2
Offset Y         0.3
F Size           30
```

Once the project is imported you could start using the demo scene to check how the equation script “SimpleFormula” works. Try changing the values and hitting the create/delete equation buttons.

3. PROJECT DESCRIPTION

This is a simple equation/formula generator that allows the user to write equations in text form into mathematical visual expressions as shown in the video. These expressions can be of the typeof exponential (a)^(b) ;   division (a)/(b) or limits (a)L(b). Only one level of indentation is possible with this package.

This package contains the following:

-The necessary textures, fonts and scene shown in the video.

-Scripts that manage the equation generation.

-Complete documentation to understand the principles of each package and full email support at: michael.soler.beatty@gmail.com.

4. LAYERS, TAGS AND COLLIDERS

LAYERS

- Default→ all objects are placed here.

TAGS:

- All objects are on the default layer.

COLLIDERS

- No colliders are used.

5. SCRIPTING INFORMATION

We always comment our script on the C# to make developers follow our code better. We have copied the main script's variables and functions in the following table:

SimpleFormula.cs	
This script is the one that manage the equations/formula of the asset.	
Important variables	**Important functions**
//This is the parent of the text objects that we are going to cre	//this function creates th
ate	e equation by adding/combi
public Canvas *target_Canvas*;	ning different prefabs and
/This is the prefab used for simple text	changing the texts inside
public GameObject *prefabText*;	public void *CreateEquation*
//This is the prefab used to create fractions of type ()/()	()
public GameObject *prefabFraction*;	
//This is the prefab used to create powers of type ()^()	
public GameObject *prefabPower*;	
/This is the prefab used to create limits of type ()L()	
public GameObject *prefabLimit*;	
// this is the equation in a text format	
public string *equation*;	
//this is the the public variable that is going to set the distan	

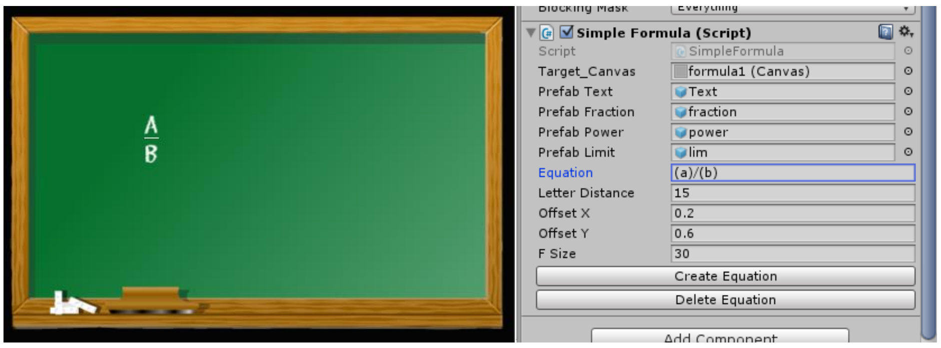
```
ces between equations:
public int letterDistance=10;
//offset to place X and Y text in percentage
public float offsetX, offsetY;
// size of the fonts:
public int fSize;

/these are local variables to refer to the instances of the formu
la types:
GameObject fraction, text, power, limit;
```

6. HOW THE PACKAGE WORKS

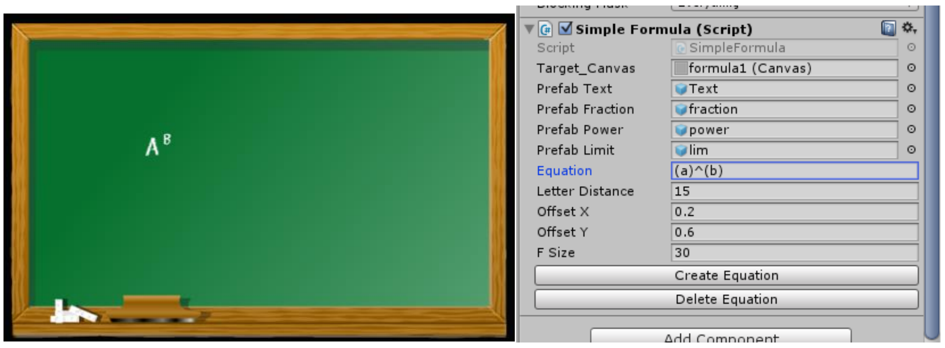
The package works as follows:

1. Write (a)/(b) to obtain $\frac{a}{b}$



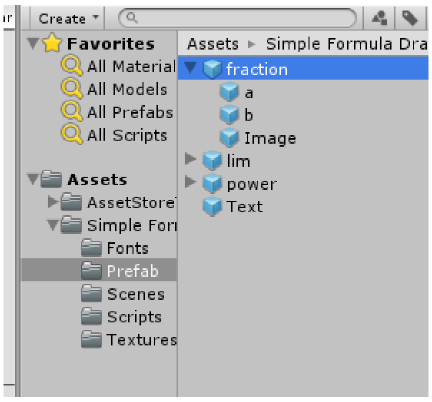
Script	SimpleFormula
Target_Canvas	formula1 (Canvas)
Prefab Text	Text
Prefab Fraction	fraction
Prefab Power	power
Prefab Limit	lim
Equation	(a)/(b)
Letter Distance	15
Offset X	0.2
Offset Y	0.6
F Size	30

2. Write (a)^(b) to obtain a^b

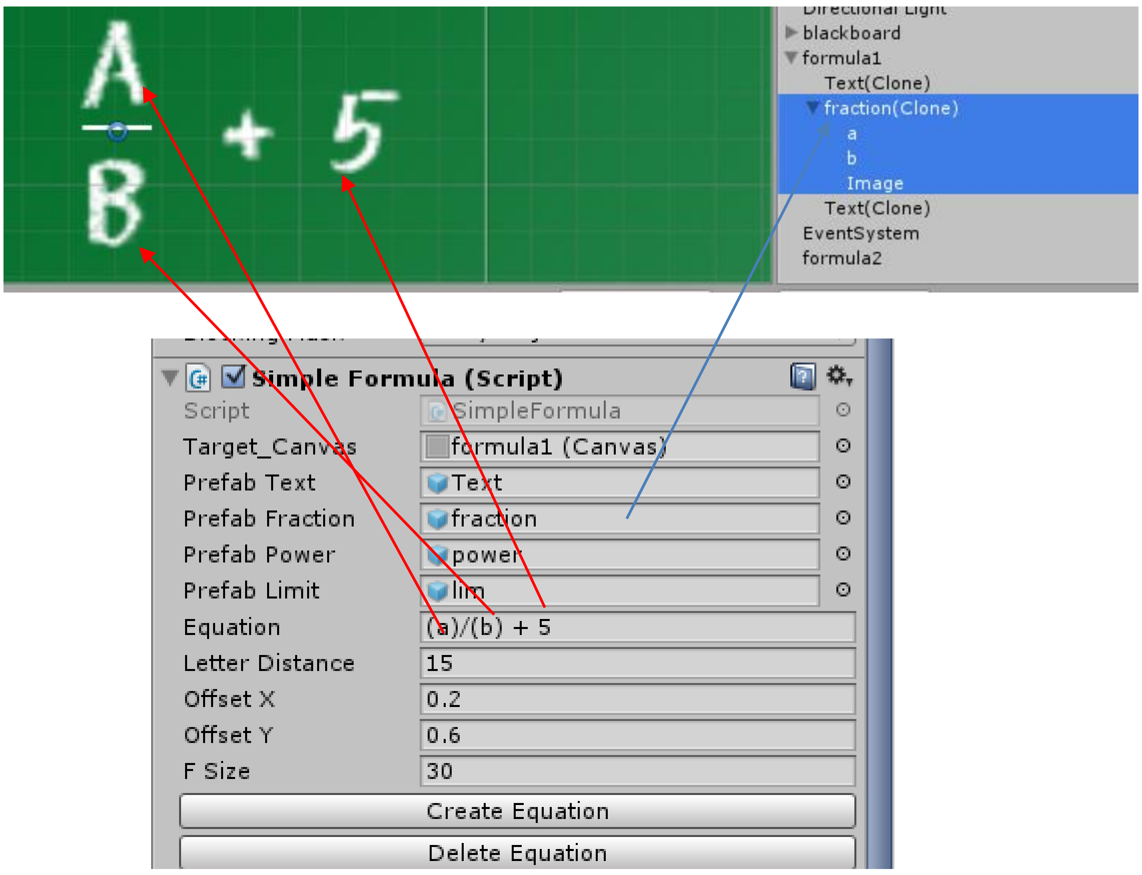


Script	SimpleFormula
Target_Canvas	formula1 (Canvas)
Prefab Text	Text
Prefab Fraction	fraction
Prefab Power	power
Prefab Limit	lim
Equation	(a)^(b)
Letter Distance	15
Offset X	0.2
Offset Y	0.6
F Size	30

These equations are achieved by using some prefabs that have text classes that are called and modified from script. Take for instance the case of the fraction:



When we write “(a)/(b) + 5” in the “SimpleFormula” script, the program is going to instanciate that gameobject in a specific location and it is going to add the variable values to the “a” and “b” text classes:



Script: SimpleFormula
Target_Canvas: formula1 (Canvas)
Prefab Text: Text
Prefab Fraction: fraction
Prefab Power: power
Prefab Limit: lim
Equation: (a)/(b) + 5
Letter Distance: 15
Offset X: 0.2
Offset Y: 0.6
F Size: 30

From the point of view of the code, it just compares the equation string to a known expected structure such as ()/() and perform specific actions once it is found:

```
// beginning of the ( a )
            if ("" + equation [jj] == "(") {

…
```

```
            // detecting the last part of the fraction
            if ("" + equation [jj] == "/") {

            // instantiate the gameobject
      fraction = Instantiate (prefabFraction, new Vector3 (0, 0, 0), Quaternion.Eu
ler (0, 0, 0)) as GameObject;
```

7. HOW THE CREATE MORE EXPRESSIONS

In order to create more mathematical expressions, you will need to create the prefab with a similar structure to the ones that already exist: two text components and other images if needed.

Then you will need to add a new symbol to the script in order to detect the new expression:

```
// detecting your own symbol
            if ("" + equation [jj] == "new symbol") {
```