

## Show String

This program takes a word (string of alphabets) and displays it in a graphical format.

## Scratch and CS Concepts Used

When we design this program, we will make use of the following Scratch and CS concepts. Learn these concepts if you don't know them before proceeding further.

- Algorithms
  - o Abstraction
  - o Using algorithms
  - o Designing new algorithms
- Animation using costumes
- Conditional statements:
  - o Conditions: YES/NO questions
  - o Relational operators (=, <, >)
  - o Conditionals (IF)
  - o Conditionals (If-Else)
- Data types – basic
  - o Integers
- Data types – strings
  - o String operations (join, letter, length of)
- Events
- Looping (iteration)
  - o Looping - simple (repeat, forever)
- OOP
  - o Clones
- Procedures
  - o User defined (custom)
  - o Simple
  - o With inputs
- Program output
  - o Text
- Sequence
- Synchronization using broadcasting

- User input
  - o Text
- Variables
  - o Simple
  - o Local/global scope
- XY Geometry

## High Level Design

Scratch sprite library includes several sprites that look like alphabet. We will use one of these. A few examples are shown below:



A-Glow



B-Glow



C-Glow

We will build a sprite that would have 26 costumes each showing one of the letters. The costumes are named as “A-glow”, “B-glow”, and so on. So, we can figure out costume names corresponding to each alphabet easily by concatenating the letter with “-glow”. We will then display each letter by creating a clone of this sprite. In addition, we will include a square costume to represent the SPACE character and call it “blank-glow”.

## Show string algorithm

Here is the algorithm based on the idea discussed above:

### Algorithm Show String

Given:

```
string S (a sequence of letters),
(X,Y) starting point,
w (width of each costume)
```

Steps:

Go to (X,Y)

I = 1

Repeat <length of S> times

    C = letter at I in S

```
If C is a SPACE character
  Switch costume to blank-glow
Else
  Convert C to upper-case (we will discuss this later below)
  Switch costume to C-glow
End if
Create clone and display
Increment I
Change X by w
End repeat
```

Here is an example of how this component works:



The string is displayed at (-150, 0).

Display:

SCRATCH

## Changing to upper-case

In the algorithm above, we have to convert every letter to upper-case because costume names are all upper-case. For this purpose, we can simply borrow the custom block “Uppercase” from our string library. Look up [this guide](#) to figure out how to download and use the library. The component we are interested in is available as “strings.sprite2” which you can import into your project as a sprite.

## **Final program**

Download the program [here](#).

MIT website link: <https://scratch.mit.edu/projects/482531375/>

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