Algorithm Design & Problem Solving:

Introduction to Scratch

Contents

1 Overview of Scratch

2 Practical implementation of Scratch

3 Programming constructs

4 An exercise ….

What is Scratch?

- Developed by MIT Media Lab.
- Makes use of snippets of code embedded in blocks shaped like puzzle pieces.
- Gives immediate visual feedback.

FruitcraftRPG

What is Scratch?

You can download it free from

http://scratch.mit.edu

You should register on the website so that you can upload and share your code.

What is Scratch?

- It was originally designed for children but is now regularly used in first year third level courses e.g.,
  - Harvard University
  - Rutgers University
  - Norfolk State University
  - ……

Hello, C

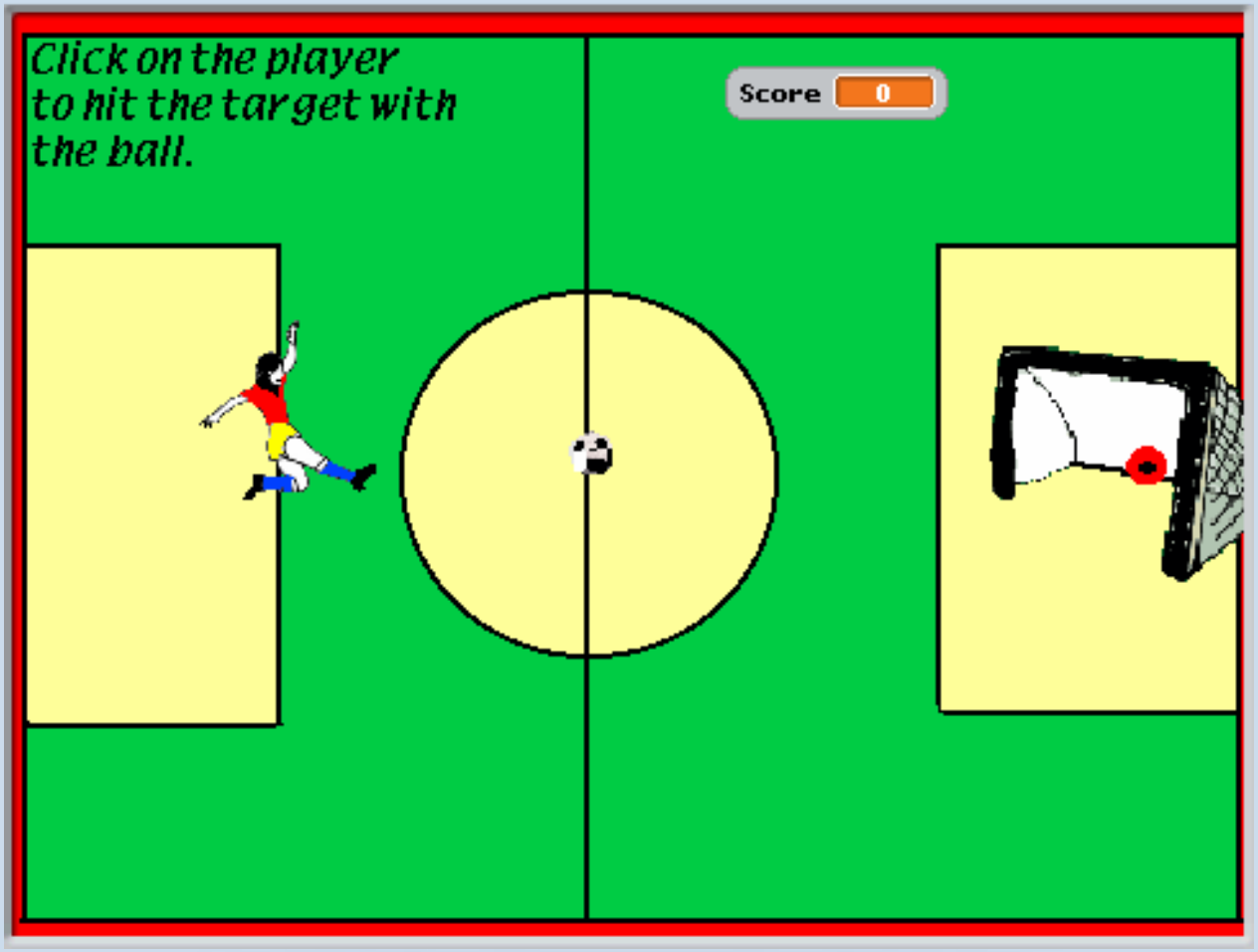
```
#include <stdio.h>
int
main(int argc, char * argv[])
{ printf("hello, world\n"); }
```

Hello, Scratch

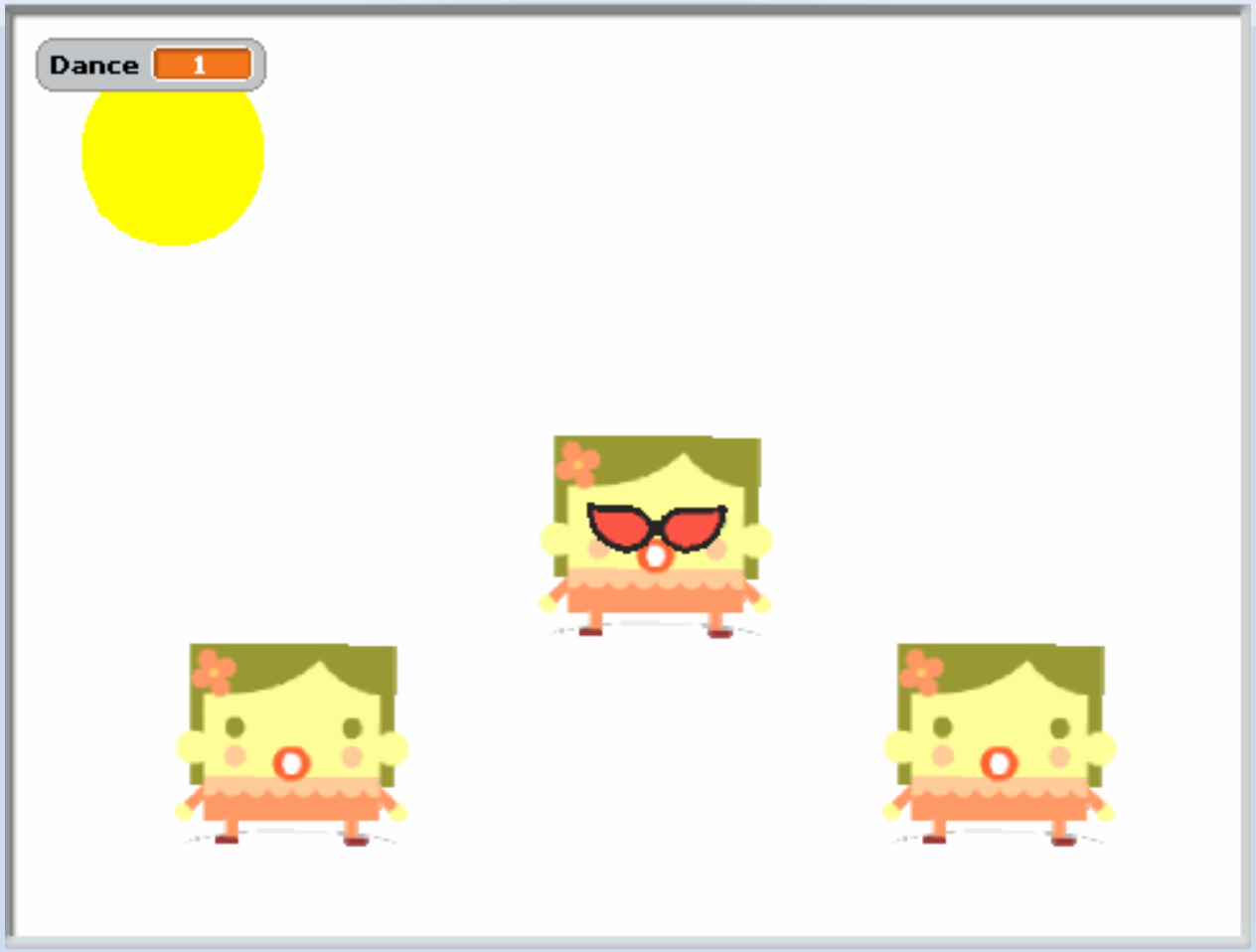
Welcome to Scratch!

Dancing cookies

Welcome to Scratch!

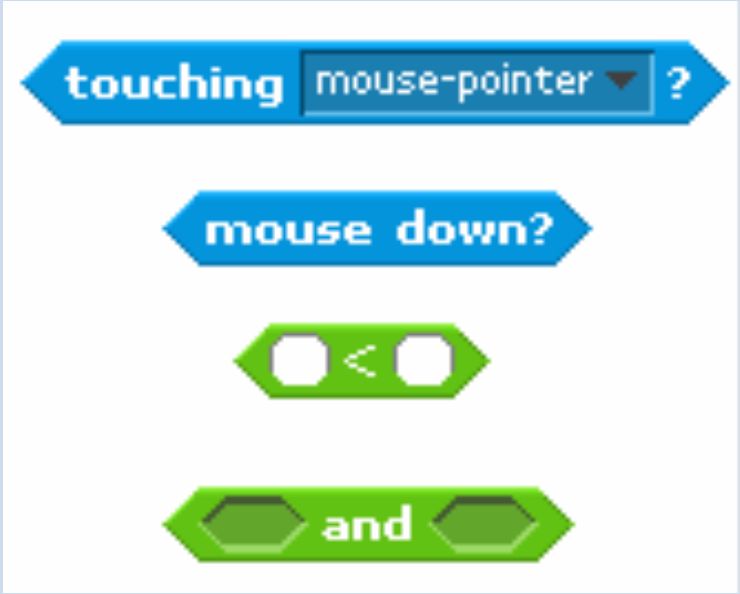


Welcome to Scratch!

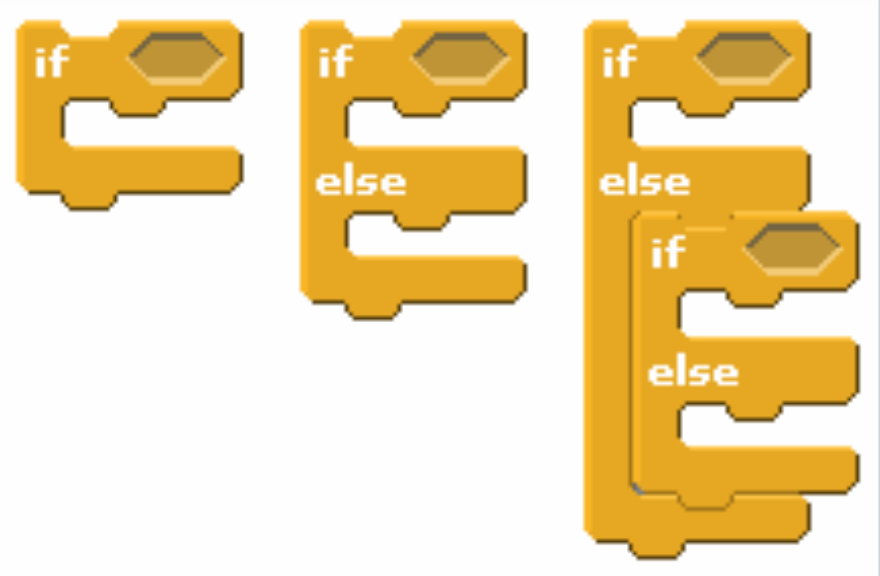


Some Statements

Some Boolean expressions



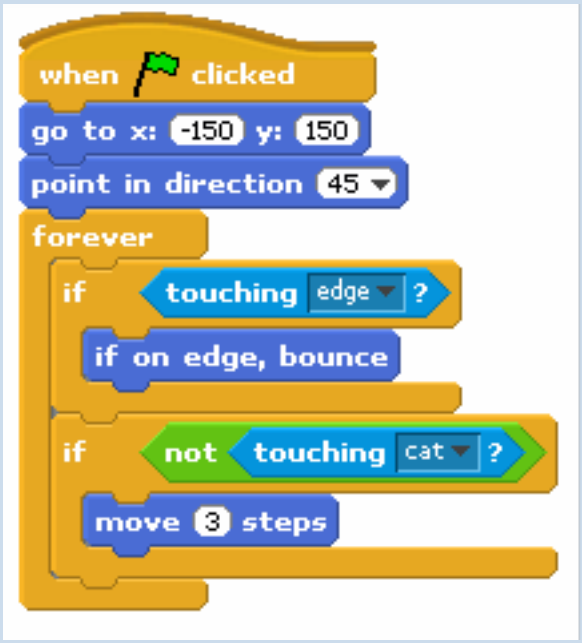
Some conditions



Some loops

Some variables

Threads


when clicked
go to x: -150 y: 150
point in direction 45
forever
if touching edge ?
if on edge, bounce
if not touching cat ?
move 3 steps

when clicked
go to x: -160 y: -160
point in direction pick random 91 to 179
forever
if touching bird ?
play sound roar
stop script
point towards bird
move 1 steps

Events

when clicked
forever
if key space pressed?
say Marco! for 2 secs
broadcast event

when I receive event
say Polo! for 2 secs

Scratch meets C

```
int
main(int argc, char *
argv[])
{
    printf("hello, world\n");
}
```

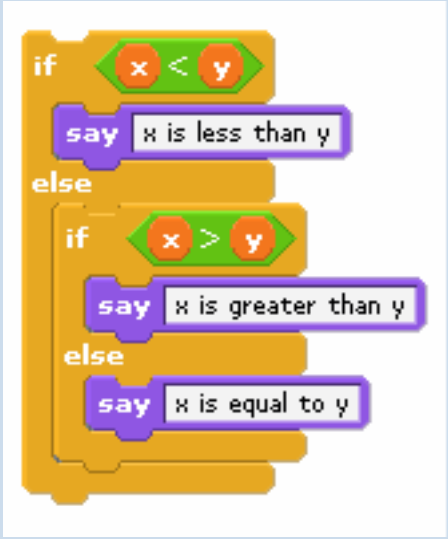
Statements

```
printf("hello, world\n");
```

Boolean Expressions

If (x < y)
If ((x < y) && (y < z))

Conditions



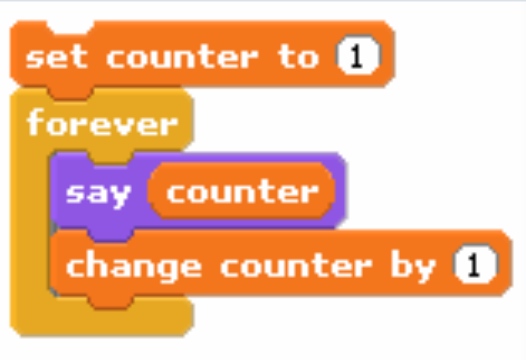

```
if (x < y)
{
    printf("x is less than y\n");
}
else if (x > y)
{
    printf("x is greater than y
\n");
}
else
{
 printf("x is equal to y\n");
}
```

Loops

```
while (1)
{
    printf("Hello!\n");
}
```

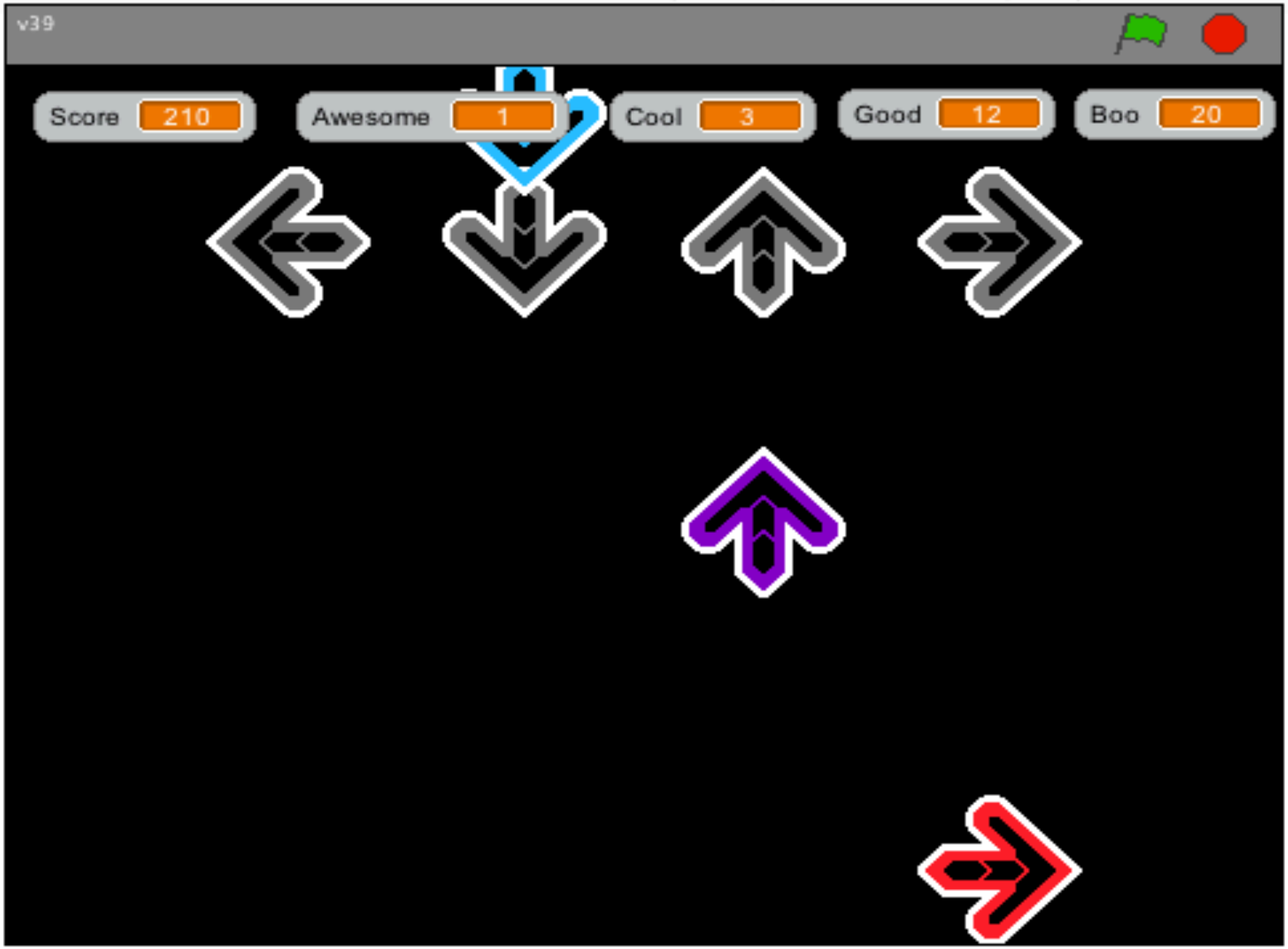
```
for (i = 0; i < 10; i++)
{
    printf("Hello!\n");
}
```

Variables



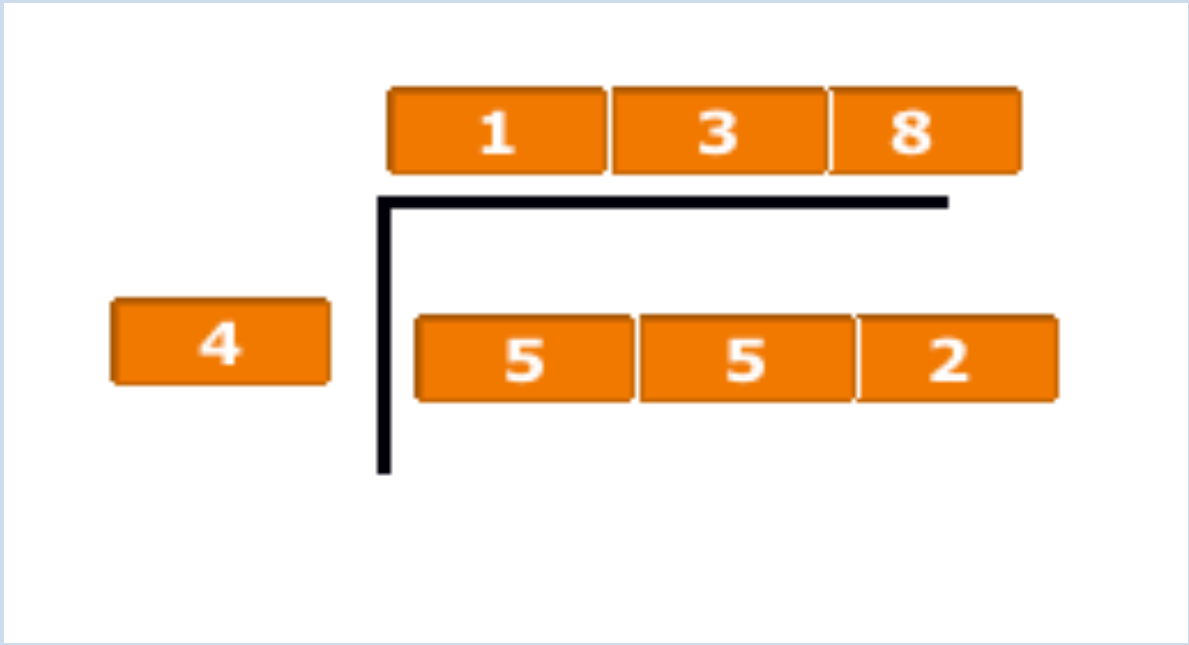

```
int counter = 0;
while (1) {
printf("%d\n", counter);
counter++; }
```

Scratch Scratch Revolution! (Kanye- Stronger)



Division

Write the pseudo code for a simple division problem such as the following.



** You will need this for lab on Monday

Thank You !

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