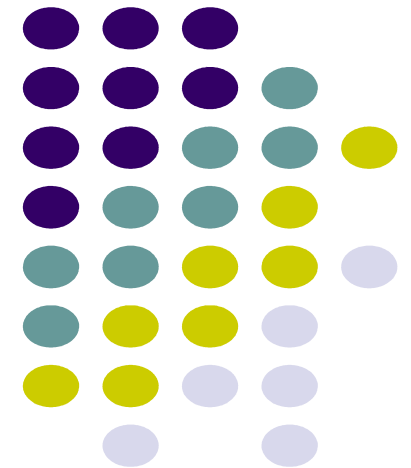


Teaching and Learning Math Behind Computer Science with the Help of GeoGebra and Python

The paper is focused on topics where mathematics and computing are most relevant to each other, emphasizing the bridges between theory and practice. Topics include sets, relations, elementary graph theory, asymptotic notation and growth of functions, permutations and combinations, discrete probability. The main tools in order to support and compare problem-solving technique are GeoGebra and Python.

The main goal is not only to combine an appreciation of mathematical reasoning with an understanding of computing but enrich both of them through interdisciplinary approach.

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GeoGebraBooks

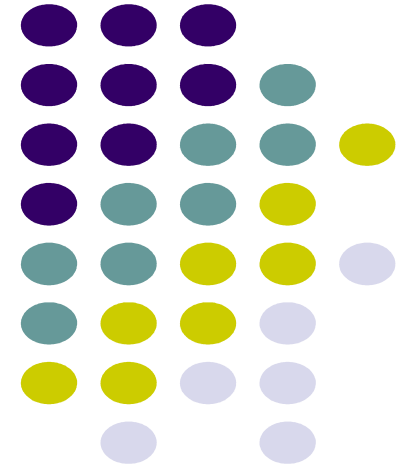
with **Python** example on topics:

- Discrete math

- <https://www.geogebra.org/m/oz0TtfO8>

-
- Games

- <https://www.geogebra.org/m/FTJZgE9G>



Teaching and Learning Math and Computer Science through Game Design



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Kharkiv National Pedagogical University, Ukraine
Kharkiv GeoGebra Institute geogebra.org/kharkivgi

GAME <-> EDUCATION

FUN <-> BOREDOM



GAME <-> EDUCATION

FUN <-> BOREDOM

- Gamification
- Educational games (and game-like simulations)
- Game design (learning through making)

GAMIFICATION

Gamification is

the use of game elements and game design techniques in non-game contexts



The screenshot displays a fitness app interface with several gamified features:

- My Goals & Challenges:** Shows 1 Medal (a gold coin with a '2') and 1 Trophy (a gold cup).
- My Farthest Run:** Displays a yellow diamond-shaped sign with '4.01 mi'.
- My Fastest Runs:** Shows a digital display with three time segments: '8'15"' (1 MI), '30'37"' (5K), and '0'00"' (10K).
- 2010 Challenge:** A red box with the Nike logo and '2010'. Text below reads: 'See how you did in 2010 then fire up to run even better in 2011.' A 'CHECK STATS' button is at the bottom.
- Weekly Run Goal:** A green and yellow pill with a runner silhouette on top. Text below reads: 'You run 0 times a week on average. Make it 1 with a monthly goal.' A 'SET A GOAL' button is at the bottom.
- Training Program:** A bar chart with a runner silhouette. Text below reads: 'You run most on Wednesday. Add more days to the mix with a training program.' A 'SET A PROGRAM' button is at the bottom.

Gamification. Example



EDUCATIONAL GAMES

Learn & Play



Code.org/learn



Класичний лабіринт

Вчіться програмувати з Марком Цукенбергом та Злими птахами!



Створіть гру Пурха

Створіть власну гру - Пурха, Акулу чи Підводного човна



Ігрова лабораторія

Створіть гру або історію за участі персонажів Діснея Infinity.



Зоряні війни: Закодуємо далеку Галактику

Навчись програмувати дроїдів, створи власну гру Зоряних воєн у далекій-далекій галактиці.



Програмуємо з Анною та Ельзою

Вивчимо програмування, приєднавшись до Анни та Ельзи у подорожі чарівною зимовою казкою.



Година коду від Майнкрафт

Використайте блоки коду, щоб допомогти Стіву чи Алекс в їхніх пригодах у світі Майнкрафт.

Teacher's Page

Домашняя страница Преподавателя



Учетные записи и прогресс студента



Твой прогресс в обучении



Планы уроков и ресурсы



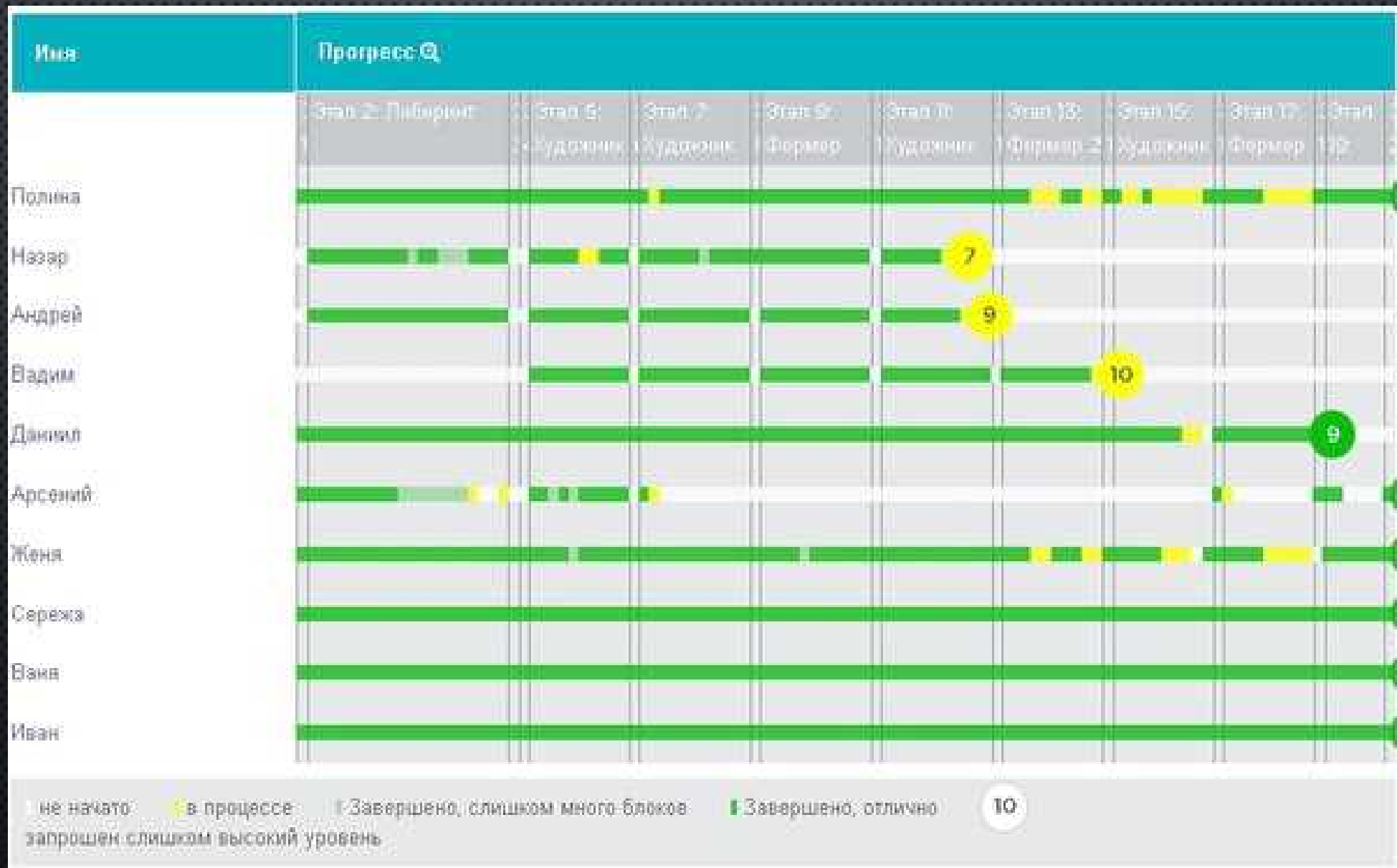
Помощь и сообщество



Профессиональная разработка



Информатика приглашенные ораторы



Курс 1

От 4 до 6 лет

Курс 1 позволяет рано научившимся читать создавать компьютерные программы, которые помогут ученикам взаимодействовать друг с другом, развивать навыки решения задач и преодолевать трудности. К концу курса ученики создадут свои первые собственные игры или истории, которыми можно поделиться. Рекомендуется для дошкольников и первоклассников.



Курс 2

От 6 до 18 лет

Курс 2 разработан для учеников, умеющих читать, без опыта программирования. В этом курсе ученики будут создавать программы для решения задач и разрабатывать интерактивные игры или истории, которыми они могут поделиться. Рекомендуется для 2-5 классов.



Курс 3

От 8 до 18 лет

Курс 3 разработан для учеников, освоивших Курс 2. Ученики будут глубже вникать в темы, с которыми познакомились в предыдущем курсе, осваивая решение более сложных задач. К концу курса ученики создают интерактивные истории и игры, которыми они могут поделиться с другими. Рекомендовано для 4-5 классов.



Курс 4 **Бета-версия**

Возраст 10+ (после курса 3)

4 курс предназначен для студентов, которые прошли курсы 2 и 3. Студенты научатся решать головоломки повышенной сложности, обучаясь тому, как совмещать сразу несколько принципов, работая над решением каждой задачи. К моменту завершения этого курса студенты будут создавать программы, которые позволят им продемонстрировать многочисленные навыки, включая цикл for и функции с параметрами. Рекомендуется для



MINECRAFT



Blocks

move forward

turn left

turn right

when run

move forward



Run

Hit "Run" to try your program



Add a second "move forward" command to reach the sheep.



▶ Выполнить



«Собери всех Пилоты Повстанцев  как можно быстрее».



Блоки

иди **вверх** ▼

иди **вниз** ▼

иди **влево** ▼

иди **вправо** ▼

когда клавиша **вверх**:

иди **вверх** ▼

когда клавиша **вниз**:

иди **вниз** ▼

когда клавиша **влево**:

иди **влево** ▼

когда клавиша **вправо**:

иди **вправо** ▼

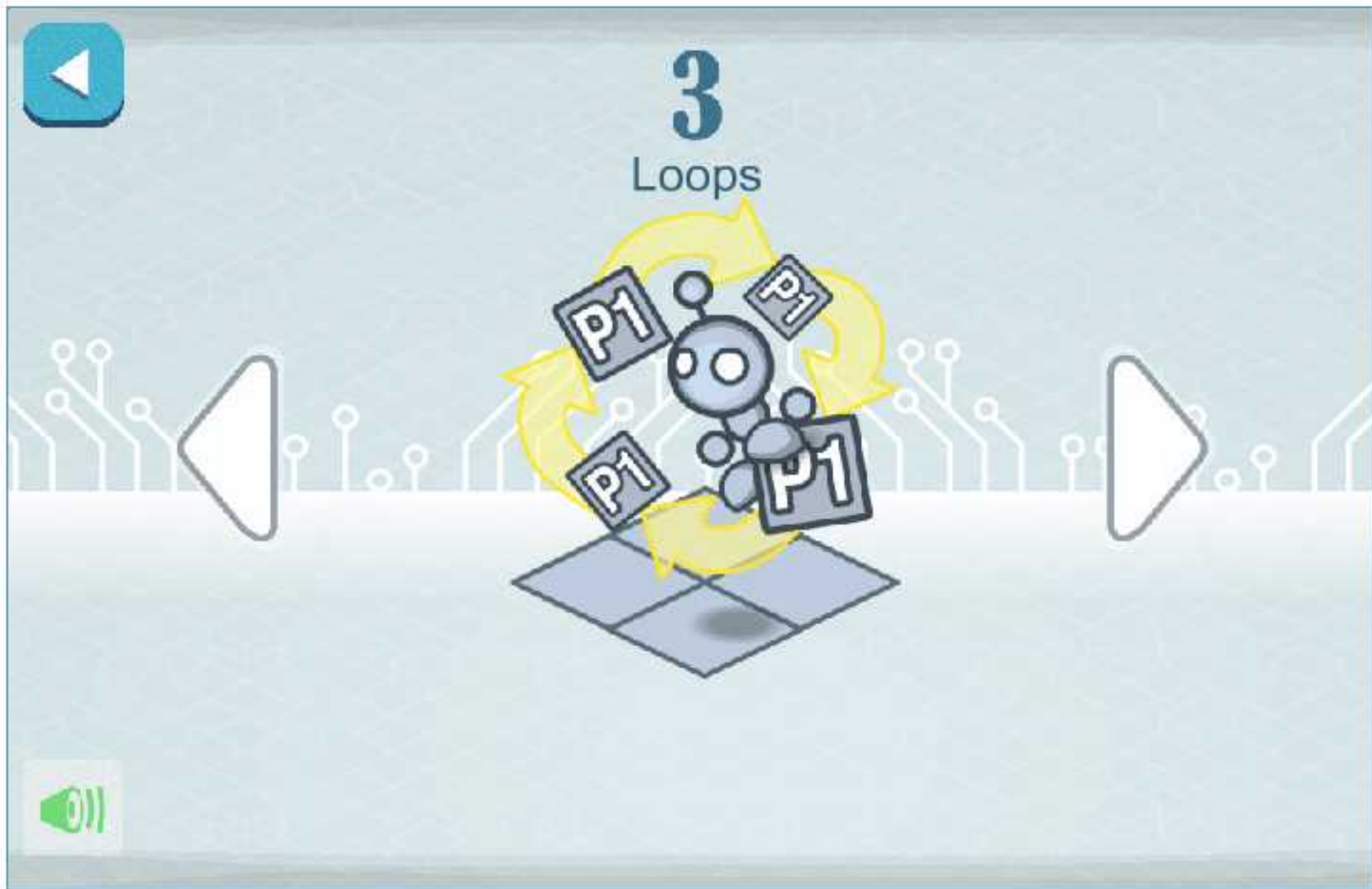
lightbot™

Program Lightbot to **light up** all of the **blue** squares!

Language Select and Full Screen options can be found in the game menu along the right side.

The screenshot shows the main interface of the Lightbot game. In the top left corner, there is a 'Fullscreen' button and a small purple robot icon. The center of the screen features the 'lightbot' logo and a larger grey robot character standing on a green rectangular platform with a white play button icon. To the right of the robot is a grid of 28 circular icons representing various national flags, arranged in 7 rows and 4 columns. At the bottom left, there is a speaker icon. At the bottom center, there is a floppy disk icon and the text 'Slot1'.

Language Select and Full Screen options can be found in the game menu along the right side.



Обучающее руководство на Вашем языке

The image shows a tutorial screen for the game Lightbot. It features a central robot character, a maze with a yellow starting square, and a code editor. A speech bubble explains the 'P1' command. The interface includes navigation arrows and a 'Start' button.

You can use the **P1** command inside **PROC1** to make a loop!

```
PROC1  
↑ P1
```

Lightbot

Старт



Tutorial

<https://lightbot.com/LightbotSolns.pdf>

The image displays eight individual puzzle solutions for the Lightbot game, arranged in a 4x2 grid. Each solution is labeled from 'Basics 1' to 'Basics 8'. Each solution consists of a 3D-rendered scene with a robot on a grid and a menu of commands (represented by icons: a lightbulb, a house, a square, a circle, and a square) that the robot can use to solve the puzzle. A green play button is visible at the bottom of each puzzle scene.

- Basics 1:** The robot is on a 2x2 grid. The menu contains three icons: a lightbulb, a house, and a square.
- Basics 2:** The robot is on a 3x3 grid. The menu contains seven icons: a lightbulb, a house, a square, a circle, a square, a house, and a square.
- Basics 3:** The robot is on a 3x3 grid. The menu contains six icons: a lightbulb, a house, a square, a circle, a square, and a square.
- Basics 4:** The robot is on a 3x3 grid. The menu contains six icons: a lightbulb, a house, a square, a circle, a square, and a square.
- Basics 6:** The robot is on a 3x3 grid. The menu contains ten icons: a lightbulb, a house, a square, a circle, a square, a house, a square, a house, a square, and a lightbulb.
- Basics 7:** The robot is on a 3x3 grid. The menu contains ten icons: a lightbulb, a house, a square, a circle, a square, a house, a square, a house, a square, and a lightbulb.
- Basics 8:** The robot is on a 3x3 grid. The menu contains ten icons: a lightbulb, a house, a square, a circle, a square, a house, a square, a house, a square, and a lightbulb.

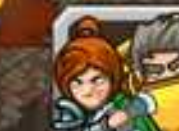
codecombat.com





Подземелье Китгарда

17/39



ПРЕДМЕТЫ

906



- Все
- Воин
- Рейнджер
- Волшебник

- РАЗНОЕ
- АКСЕССУАРЫ
- ОСНОВНОЕ
- ВТОРОСТЕП...
- БРОНЯ
- КНИГИ

ОБСИДИАНОВЫЙ НАГРУДНИК	ОБСИДИАНОВЫЙ ШЛЕМ	РЕЗНОЙ ОБСИДИАНОВЫЙ НАГРУДНИК
620	660	100
РАЗБЛОКИРОВАТЬ	РАЗБЛОКИРОВАТЬ	РАЗБЛОКИРОВАТЬ
1600	1200	2500
РАЗБЛОКИРОВАТЬ	РАЗБЛОКИРОВАТЬ	РАЗБЛОКИРОВАТЬ
РЕЗНОЙ ОБСИДИАНОВЫЙ ШЛЕМ	УРОВЕНЬ 16	УРОВЕНЬ 16
1700	ЗАБЛОКИРОВАНО	ЗАБЛОКИРОВАНО
РАЗБЛОКИРОВАТЬ		





УРОВНИ

САМОЦВЕТЫ НА ГЛУБИНЕ

МЕНЮ ИГРЫ

ТЕКУЩИЙ МЕТОД PLAN

ПЕРЕЗАГРУЗИТЬ

Убегай шипов.
Собери самоцветы.
УСПЕШНО!

moveRight

```
1 // Собери все самоцветы используя команды перемещения.  
2  
3 this.moveRight();  
4 this.moveDown();  
5 this.moveUp();  
6 this.moveUp();  
7 this.moveRight();  
8  
9
```

ЗАПУСТИТЬ

ГОТОВО

Помощь

```
this.moveDown();  
this.moveLeft();  
this.moveRight();  
this.moveUp();
```

THARIN

11

1. ВЫПОЛНЯЕТСЯ



```

1 // Выживите под напором огров.
2 // Если вы выиграете, то уровень станет тяжелее, а награда за
  победу больше.
3 // Если вы проиграете, то сможете попробовать опять только через
  день.
4 // Уровень меняется каждый раз при попытке прохождения.
5 while(true){
6     var enemies = this.findEnemies();
7     for(var i=0;i<enemies.length;i++){
8         this.attack(enemies[i]);
9     }
10 }
11

```

В ПРОЦЕССЕ ЗАВЕРШИТЬ IN A DAY

THARIN 183

Помощь

distanceTo(target)	moveDown()	else
findByType(type, ...)	moveLeft()	if/else
findEnemies()	moveRight()	loop
findFriends()	moveUp()	isReady(action)
findItems()	findFlag(color)	now()
findNearest(units)	pickUpFlag(flag)	attack(target)
say(message)	pos	cleave(target)
		shield()

LEVELS

GAME

CURRENT PLAN

RELOAD

- ✓ Dodge the fireballs forever.
- ✓ Under 4 statements.

GOALS: SUCCESS!

VICTORY



+11



+10

JUMP TO THE LEFT. STEP TO THE RIGHT. REPEAT.



+6



+5

CLEAN CODE: NO CODE ERRORS OR WARNINGS.



+6

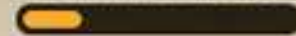


+5

DONE IN FEWER THAN 4 CODE STATEMENTS.

+23

XP GAINED - LEVEL 7



+20

GEMS GAINED

CONTINUE

x: 20, y: 29]

ONE

ank(target)

ANY

INVENTORY

139



FINE WOODEN GLASSES

Lets you find arrays of items and find the nearest item separately.

SKILLS GRANTED

distanceTo: Returns the distance in meters to the **target** unit from the center of the hero.

findItems: Returns an array of all items (example types 'coin', 'gem', 'health-potion') within eyesight (**visualRange** m and line-of-sight).

findNearest: Returns the closest unit out of an array of units, or null if the array is empty.

findNearestEnemy: Returns the closest living enemy within eyesight (**visualRange** m and line-of-sight), or null if there aren't any.

findNearestItem: Returns the closest item within eyesight (**visualRange** m and line-of-sight), or **null** if there aren't any.

LOCKED



Change Hero

Play

Unequip

Первый уровень



Second Level



0/48

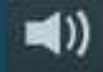


595 LEVEL 10
codecombat.com



LOG OUT





Доступные бесплатные уровни.
Открываются по мере прохождения

KITHGARD DUNGEON
19/39

PLAY

1-3 hours: syntax, methods, parameters, strings, loops, variables

BACKWOODS FOREST
0/48

PLAY

2-6 hours: if/else, relational operators, object properties, input handling

SARVEN DESERT
0/41

LOCKED

4-11 hours: arithmetic, counters, while-loops, break, arrays, string comparison, finding min/max

CLOUDRIP MOUNTAIN
0/42

LOCKED

Object literals, remote method invocation, for-loops, function drawing, modulo

БИТВЫ. Много игроков

MULTIPLAYER ARENAS

... in which you code head-to-head against other players.



ACE OF CODERS

DIFFICULTY: ★★ ★ - 14703 PLAYERS

PLAY

The banner for 'Ace of Coders' features a central title in large, yellow, bubbly letters. On the left, a large, muscular, bald warrior with a red and white striped tunic and a red cross on his chest stands prominently. To his right, several smaller, armored knights are visible. On the right side of the banner, another large, muscular warrior in a blue and white tunic is shown. The background is a light blue, icy landscape with snow-capped mountains and a large, dark, circular arena floor in the center.



ZERO SUM

DIFFICULTY: ★★ ★ - 4663 PLAYERS

PLAY

Battle for control over the icy treasure chests as your gigantic warrior marshals his armies against his mirror-match nemesis.

The banner for 'Zero Sum' features a central title in large, yellow, bubbly letters. On the left, a large, golden, pharaoh-like figure with a red gem on his forehead is shown. To his right, several smaller, armored knights are visible. On the right side of the banner, another large, muscular warrior in a blue and white tunic is shown. The background is a light blue, icy landscape with snow-capped mountains and a large, dark, circular arena floor in the center.

bat.com/play/ladder/ace-of-coders

Open Source Project

<https://github.com/codecombat/codecombat/wiki>

The screenshot shows the GitHub Wiki page for CodeCombat. At the top, it displays the repository name 'codecombat / codecombat' and statistics: 400 Watchers, 4,000 Stars, and 2,100 Forks. Navigation tabs include Code, Issues (366), Pull Requests (8), Wiki (selected), Tours, and Graphs. The main heading is 'Home', with a note that 'Poppy Gilbert edited this page on 24 Mar - 38 revisions'. Below this is a grid of six role-based home pages, each with a representative image: Archmage Home - Coders! (a wizard at a computer), Artisan Home - Builders! (a woman with a blueprint), Adventurer Home - Testers! (a knight in a forest), Scribe Home - Scribblers! (a wizard with scrolls), Diplomat Home - Translators! (a man with a book), and Ambassador Home - Supporters! (a knight with a banner). To the right is a 'Pages' sidebar with a tree view of the wiki's structure, including sections for 'Home', 'Archmage General', 'Artisan General', 'Adventurer General', 'Scribe General', and 'Diplomat General'. A welcome message at the bottom reads: 'Hello CodeCombat contributors! Welcome to the wiki for CodeCombat. These documents are designed to give you everything you need to know, technical and non-technical, to dive into the project. If you see an opportunity to improve the docs, go ahead!'.

codecombat / codecombat

Watch 400 Star 4,000 Fork 2,100

Code Issues 366 Pull Requests 8 Wiki Tours Graphs

Home

Poppy Gilbert edited this page on 24 Mar - 38 revisions

Archmage Home - Coders!

Artisan Home - Builders!

Adventurer Home - Testers!

Scribe Home - Scribblers!

Diplomat Home - Translators!

Ambassador Home - Supporters!

Pages

- Home
 - Archmage Home
 - Artisan Home
 - Adventurer Home
 - Scribe Home
 - Diplomat Home
 - Ambassador Home
- Archmage General
 - Mission statement
 - Code Models
 - Coding Guidelines
 - File system
 - JSDoc Schema
 - Testcase overview
 - Testing
 - Third party software and services
- Artisan General
 - Building A Level
 - Coding Guidelines for Artisans
 - Editing Thing Components
 - Important Artisan Concepts
 - Keyboard Shortcuts
 - Artisan How To Index
- Adventurer General
- Scribe General
- Diplomat General

Hello CodeCombat contributors! Welcome to the wiki for CodeCombat. These documents are designed to give you everything you need to know, technical and non-technical, to dive into the project. If you see an opportunity to improve the docs, go ahead!

- Python
- JavaScript
- CoffeeScript
- Clojure
- Lua



codewars.com



Особенности регистрации.

Подтверждения знания синтаксиса выбранного языка:

 The code does not execute properly. Try to figure out why.

```
def multiply(a, b):  
    a * b
```

Submit

❗ Correct this code, so that the greet function returns the expected value.

```
class Person:
    def __init__(self, name):
        self.name = name

    def greet(self, other_name):
        return "Hi {0}, my name is {1}".format(other_name, name)
```

```
Hi Mary, my name is Peter
```

```
>>>
```

```
*Python 2.7.6: 000.py - /home/vpikalova/000.py*
```

```
File Edit Format Run Options Windows Help
```

```
class Person:
    def __init__(self, name):
        self.name = name

    def greet(self, other_name):
        return "Hi {0}, my name is {1}".format(other_name, self.name)

ser = Person('Peter')
print ser.greet("Mary")
```



8 kyu

4



Your Next Challenge...

Python

Rank Up

Train



7 kyu

Find the anonymous function

Your input. First Parameter will be an array with an anonymous function somewhere in the lot, The second Parameter will be an array which you will filter using the anonymous function you find.

Output

Your output. Output a filtered version of the second parameter using the function found in the first parameter.

[Fundamentals](#)[Functions](#)[Control Flow](#)[Basic Language Features](#)

Allies

You are automatically given an alligiance with anyone who is in the same clan as you. You can also become allies with other warriors by following each other or inviting new warriors to join.

Position	User	Clan	Honor
1	vpikalova	IT Univer	4

Earn extra honor and gain new allies: invite code warriors!

[Learn more](#)

Discourse [All](#) | [Questions](#) | [Issues](#) | [Suggestions](#)



Kamyk - commented on "Find Count of Most Frequent Item in an Array" python solution - 3 minutes ago

Like it, simple, clean and clever



sdkw - created an issue for "The elegance of the code" kata - 5 minutes ago

When running tests it said unknown error



hksong - created an issue for "Round to the next 5." kata - 14 minutes ago

Should include a negative example or test case to illustrate whether it rounds toward or away from 0.

Either the above or get rid of "Input may be any positive or negative integer (including 0)." from the description.





codewars

Achieve code mastery through challenge

Рейтинговая система

Training Manual

Master	8 dan	Kata In our dojo, kata are real code challenges focused on improving skill and technique. Some train programming fundamentals, while others focus on complex problem solving. Each kata is crafted for and by the community.
	7 dan	
	6 dan	
	5 dan	
Expert	4 dan	Kyu/Dan Ranks Each kata on the site is set to a Kyu/Dan rank, based on its subject area and difficulty. The community collectively determines rank in the Beta Process.
	3 dan	
	2 dan	
	1 dan	
Proficient	1 kyu	Earning Ranks You can advance through the ranks by completing kata at or above your rank - the harder the kata the faster you advance.
	2 kyu	
	3 kyu	
Competent	4 kyu	Honor Honor represents the level of respect a user has earned from the community, based on their skill and contributions. Honor is earned fastest through creating kata, crafting great solutions, and constructive comments.
	5 kyu	
Novice	6 kyu	
	7 kyu	
	8 kyu	
Beginner		



Check iO



CheckiO

▶ START THE GAME



CHECKIO IS
THE GAME
FOR CODERS

O'REILLY

HOME

ELEMENTARY 5

YOU ARE HERE

ELECTRONIC STATION

MINE

INCINERATOR



All around you are piles of old books and ancient computing machines, each with their own mystery. Can you figure out how to find the Sum in a Triangle? Can you help Sofia by writing the rhythm for her song? Keep on reading because this place is a real page-turner!



Fizz Buzz

A word game used to teach robots about division.

text

numbers

5

SOLVED • PUBLISHED • REVIEWED



Elementary



Index Power

What is the power hidden within indexes?

structures

numbers

SOLVED • PUBLISHED • REVIEWED



Elementary



Even the last

How to work with arrays indexes.

structures

numbers

SOLVED • PUBLISHED • REVIEWED



Elementary



Monkey Typing

Put enough robots in a room with typewriters and they'll produce Shakespeare.

text

SOLVED • PUBLISHED • REVIEWED



Elementary



Secret Message

SOLVED • PUBLISHED • REVIEWED



Fizz Buzz

ELEMENTARY

5

3%

Russian

SOLVED • PUBLISHED • REVIEWED



"Fizz buzz" это игра со словами, с помощью которой мы будем учить наших роботов делению. Давайте обучим компьютер.

Вы должны написать функцию, которая принимает положительное целое число и возвращает:
"Fizz Buzz", если число делится на 3 и 5;
"Fizz", если число делится на 3;
"Buzz", если число делится на 5;
Число, как строку для остальных случаев.

Входные данные: Число, как целочисленное (int).

Выходные данные: Ответ, как строка (str).

Примеры:

```
1 checkio(15) == "Fizz Buzz"
2 checkio(6) == "Fizz"
3 checkio(5) == "Buzz"
4 checkio(7) == "7"
5
```

Как это используется: Здесь вы можете научиться как писать простейшую функцию и работать с if-else.

Предусловия: $0 < \text{number} \leq 1000$

numbers

text

Vote⁽³⁸¹⁾

Solve It

Story

- ✓ Solve it
- Discuss (102)
- Timeline
- Solutions
- Random
- Python 3.3
- ➔ Get next task



<http://www.checkio.org/m/>

Users attempted: 30495

Users succeeded: 16219

Users published: 5085


```
#Your optional code here
#You can import some modules or create additional functions

def checkio(number):
    if number % 3 == 0 and number % 5 == 0:
        return "Fizz Buzz"
    elif number % 3 == 0:
        return "Fizz"
    elif number % 5 == 0:
        return "Buzz"

    return str(number)

#Some hints:
#Convert a number in the string with str(n)

#These "asserts" using only for self-checking and not necessary for auto-testing
if __name__ == '__main__':
    assert checkio(15) == "Fizz Buzz", "15 is divisible by 3 and 5"
    assert checkio(6) == "Fizz", "6 is divisible by 3"
    assert checkio(5) == "Buzz", "5 is divisible by 5"
    assert checkio(7) == "7", "7 is not divisible by 3 or 5"
```

Python console

on "Run Code" to view results or Ctrl + /
on "Save" to save your code or Ctrl + S

Enter number:

Calculate Random

Check results

"Fizz buzz" это игра со словами, с помощью которой мы будем учить наших роботов делению. Давайте обучим компьютер. Вы должны написать функцию, которая принимает положительное целое число и возвращает: "Fizz Buzz", если число делится на 3 и 5; "Fizz", если число делится на 3; "Buzz", если число делится на 5; Число, как строку для остальных случаев.
Входные данные: Число, как целочисленное (int).
Выходные данные: Ответ, как строка (str).
Предусловия: 0 < number ≤ 1000

vldyaremenko95.vy
I have no idea how to start solving this mission

bryukh
To check various cases, use [if-else](#) statements.

```
1 if condition:
2     do_something()
3 else if another_condition:
4     do_something2()
5 else:
6     do_something3()
```

vldyaremenko95.vy
I need some help to proceed with the mission

bryukh
You can check if a number is divisible with [the % operator](#). Just "if X % n == 0:" then X is divisible by n. That said, it's more pythonic to write "if not X % n:"

Someone else can help? I am gone half way through. Need help

Empireofcode.com





EMPIRE
of CODE



You can buy more builders to build or upgrade more than one building at the time.

Crystalite max 7 000

2 926

Adamantite max 2 000

Crystalite max 7 000

2 926

Adamantite max 2 000

0

Speed Boost

00:14:31

Energon

32

vpikalova

3 14

0

vpikalova

3 14

0

Builders

0/2

Builders

0/2

Build

7

Attack



CodinGame

The image shows a screenshot of the CodinGame website. On the left is a dark sidebar with navigation links: HOME, GAMES, CLASH OF CODE, JOB STORE, CONTESTS, LEADERBOARDS, FORUM, BLOG, and ABOUT US. At the bottom of the sidebar is a red button for 'For Companies'. The main content area features a large, stylized illustration of a man on a motorcycle in a zombie-infested street. The text 'Online Coding Contest' is at the top, and 'CODE vs ZOMBIES' is written in large, bold, orange letters across the center. A yellow button labeled 'JOIN THE CONTEST' is positioned below the title. At the bottom of the main area are social media icons for Facebook, Twitter, Google+, and Friend Friends, along with a plus sign for more options.

CodinGame

Add nickname
• 0
• Chat

HOME
GAMES
CLASH OF CODE
JOB STORE
CONTESTS
LEADERBOARDS
FORUM
BLOG
ABOUT US

For Companies

Online Coding Contest

CODE vs ZOMBIES

JOIN THE CONTEST

f FACEBOOK t TWITTER g+ GOOGLE+ F FRIEND FRIENDS +

TUTORIAL

100% Done



Onboarding

Recent activity: Nov 24, 2015

★ 30/30

🏆 2/2

SOLVE IT

DETAILS

100% DONE

EASY



5% Done



Power of Thor

Recent activity: Nov 25, 2015

★ 25/50

🏆 1/2

SOLVE IT

DETAILS

50% DONE



The Descent

No recent activity

★ 0/50

🏆 0/2

SOLVE IT

DETAILS

0% DONE

These companies are looking for coders like you!
Here are some cool jobs you may like



To unlock this offer,
you have to improve your
current ranking

Senior Ruby on Rails developer

Anywhere, Ukraine

Ruby

Javascript

Permanent position

DETAILS

enablon

Enablon

Score: 80

Enemies In zone: 7

Enemies killed: 6

Threat level

8/25

The Goal

Your program must destroy the enemy ships by shooting the closest enemy on each turn.

Code editor (Javascript)

```

1 /**
2  * CodinGame planet is being attacked by slimy insectoid aliens.
3  * <---
4  * Hint: To protect the planet, you can implement the pseudo-code provided in the statement.
5  **/
6
7
8 // game loop
9 while (true) {
10     var enemy1 = readline(); // name of enemy 1
11     var dist1 = parseInt(readline()); // distance to enemy 1
12     var enemy2 = readline(); // name of enemy 2
13     var dist2 = parseInt(readline()); // distance to enemy 2
14     if(dist1 < dist2){
15         print(enemy1);
16     } else {
17         print(enemy2);
18     }
19 }

```

Console output

Game information:

BeeBad has been targeted

Threats within range:

Spitfire 40m

ThunderStick 54m

Standard Output Stream:

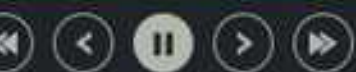
Spitfire

Game information:

Test cases

PLAY ALL TESTS

03	Surrounded	▶	04	Bee's nest	▶
----	------------	---	----	------------	---



13/27



The Goal

Your program must allow Thor to reach the light of power.

Console output

Game information:

Thor's moving...

Thor position = (18,4). Light position = (31,4). Energy = 87

Standard Output Stream:

E

Game information:

Thor's moving...



14/27

15/27

Code editor (Javascript)

```

1 //**
2 * Auto-generated code below aims at helping you parse
3 * the standard input according to the problem statement.
4 * ---
5 * Hint: You can use the debug stream to print initialTX and initialTY, if Thor seems not
6 **/
7
8 var inputs = readline().split(' ');
9 var lightX = parseInt(inputs[0]); // the X position of the light of power
10 var lightY = parseInt(inputs[1]); // the Y position of the light of power
11 var thorX = parseInt(inputs[2]); // Thor's starting X position
12 var thorY = parseInt(inputs[3]); // Thor's starting Y position
13
14 // game loop
15 while (true) {
16     var remainingTurns = parseInt(readline()); // The remaining amount of turns Thor can m
17     var direction = '';
18     if(thorX >= 0 && thorX < 40){
19         if(thorX > lightX){
20             direction = 'W';
21             printErr(thorX + " " + lightX);
22         } else if(thorX < lightX){
23             direction = 'E';
24         }
25     }
26 }
  
```

Test cases

PLAY ALL TESTS

01 Straight line

02 Up

03

04

pythonchallenge.com



[About](#)[FAQ](#)[Forum](#)[Solutions](#)[Guest Book](#)

PYTHON CHALLENGE

Квест на Питоне

The first programming riddle on the net.

1 9 3 0 5 6 1 visitors have attempted solving the challenge since May 2005.

There are currently 3 3 levels.



[Click here to get challenged](#)

What people have said about us:

"These sorts of things are in my opinion the best way to learn a language.", [brberg at Media Cloisters](#)

"It's the best web site of the year so far.", [Andy Todd at halfcooked](#)

"Addictive way to learn the ins and outs of Python.. a must for all programmers!", [salimma at stumbleupon](#)

"This challenge is fantastic. Clever, addictive and really gets your mind working. I feel like I'm playing Myst.", [James Tauber after finishing level 22.](#)

0



Hint: try to change the URL address.

1



everybody thinks twice before solving this.

g fmnc wms bgblr rpylqjyrc gr zw fylb. rfyrc qfyr amknsrclpcq ypc dmp. bmgle gr gl zw fylb
gq glcddgagclr ylb rfyrc qfyr rfgq rcvr gq qm jmle. sqgle qrpgle.kyicrpylq() gq
pcamkkclbcb. lmu ynnjw ml rfc spj.

GAME DESIGN

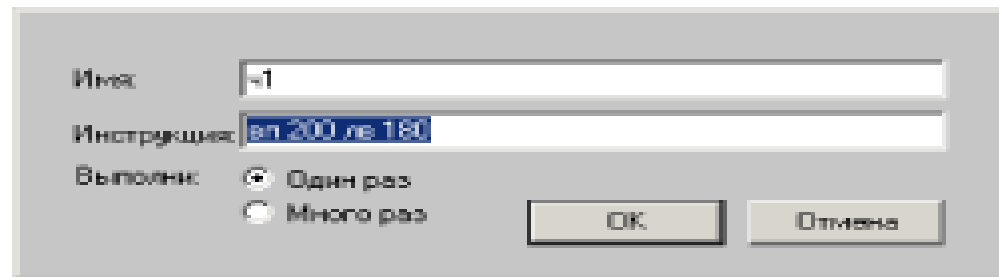
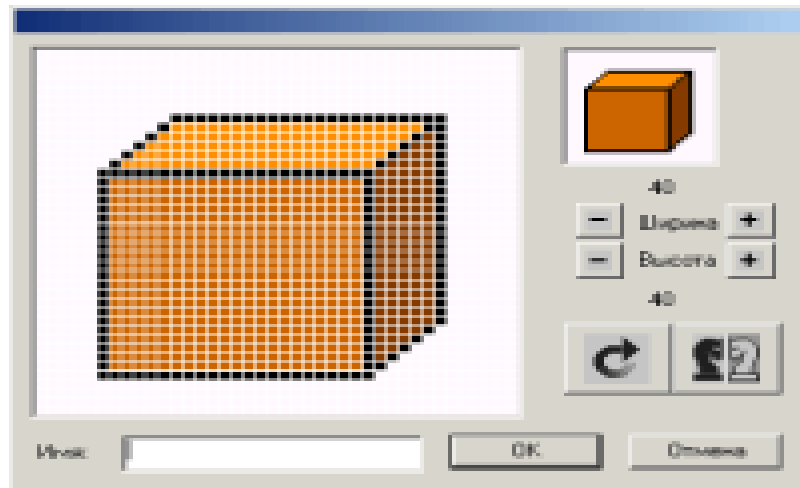
LOGOWORLDS. Логомиры 3.0



Создай черепашку Кубик/ Turtle-cube

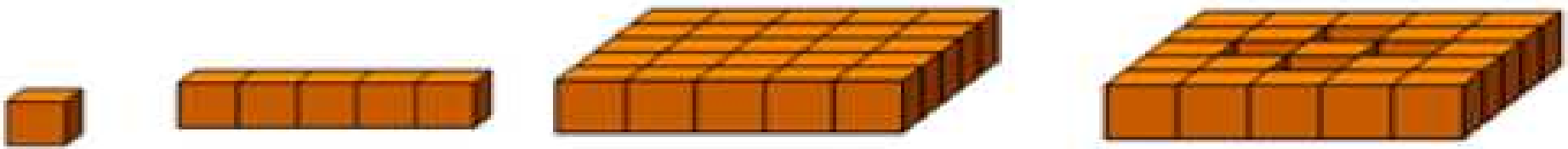
Нарисуй ей костюм (длина видимого ребра 20, длина бокового 7 под углом 45) - [sizes of cube for turtle costume](#)

Команда для черепашки: `вп 200 лв 180` - [forward 200 left 180](#)

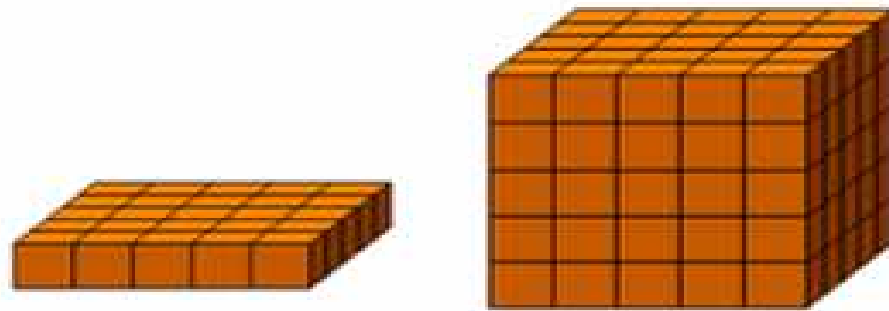




А теперь копируй черепашку и создавай по очереди:

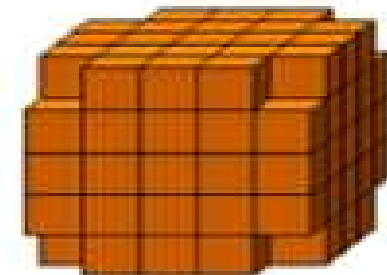
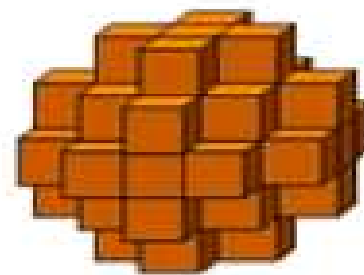
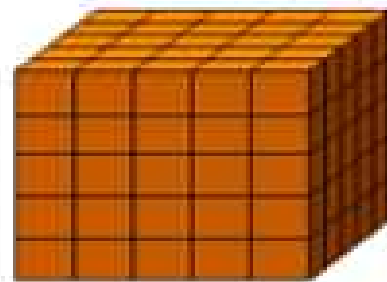
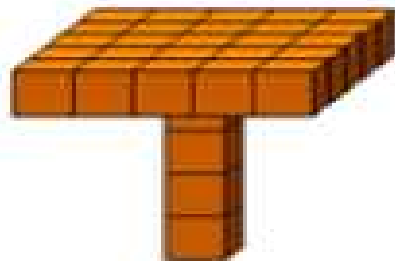
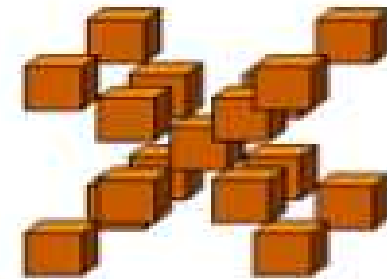
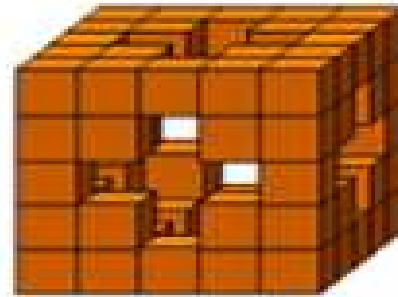
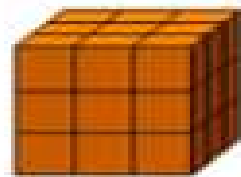
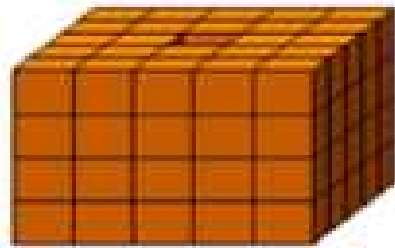


И в конце получишь Куб:



Скомандуй: **отключи "лист1"**

А какая конструкция получилась у
тебя?



Construct 2 (Html 5). Gost Shooter



<http://www.scirra.com/demos/ghost-shooter/default.aspx>



Arrow keys + click
Score: 0

35 FPS, 34 objects



Python. Codeskulptor.org

Coursera.org

coursera



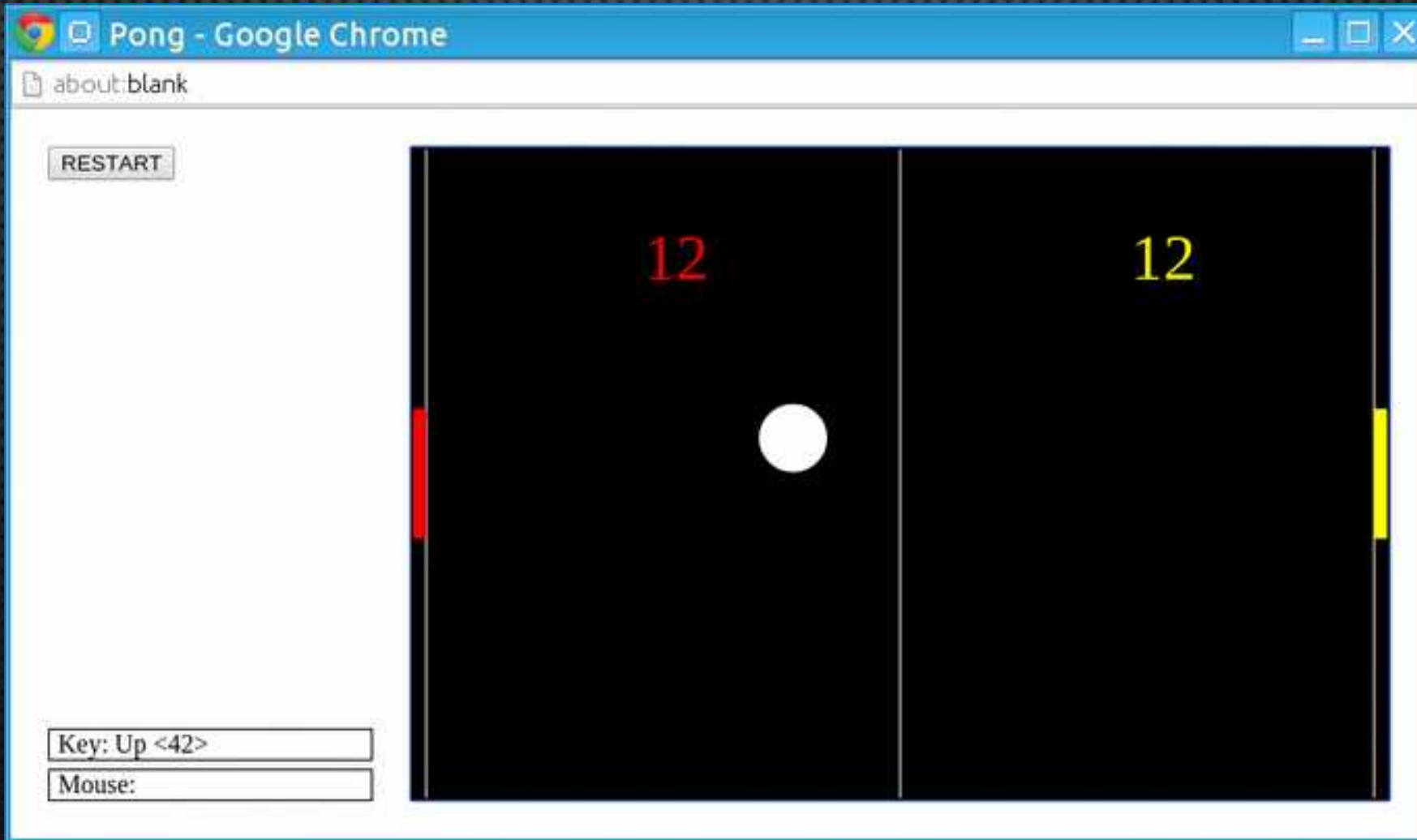
An Introduction to Interactive Programming in Python (Part 2)

by Joe Warren, Scott Rixner, John Greiner, Stephen Wong



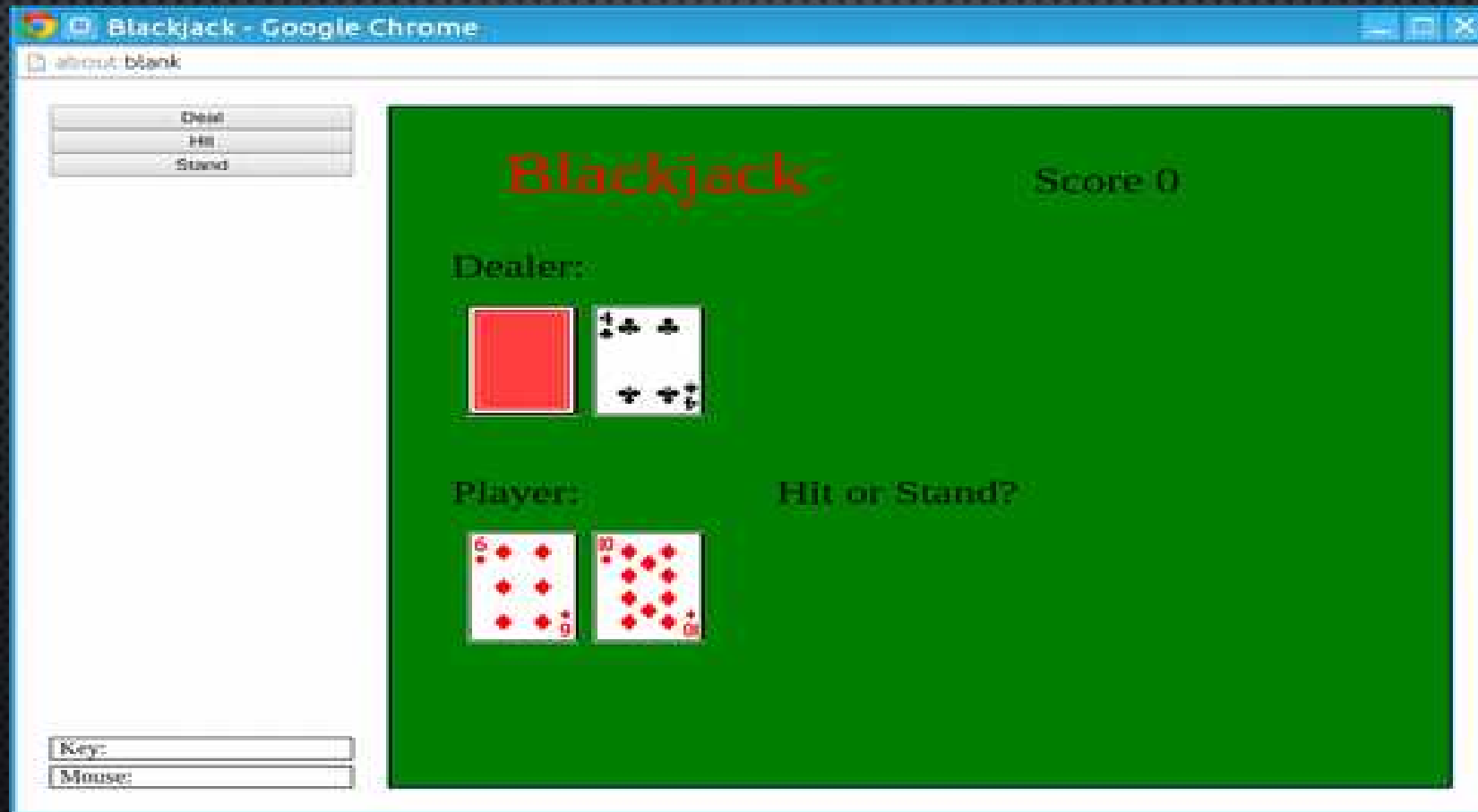
Python. Codeskulptor.org

http://www.codeskulptor.org/#user41_0irbhzHqvS_0.py



Python. Codeskulptor.org

http://www.codeskulptor.org/#user41_IfSlXniVeu_1.py

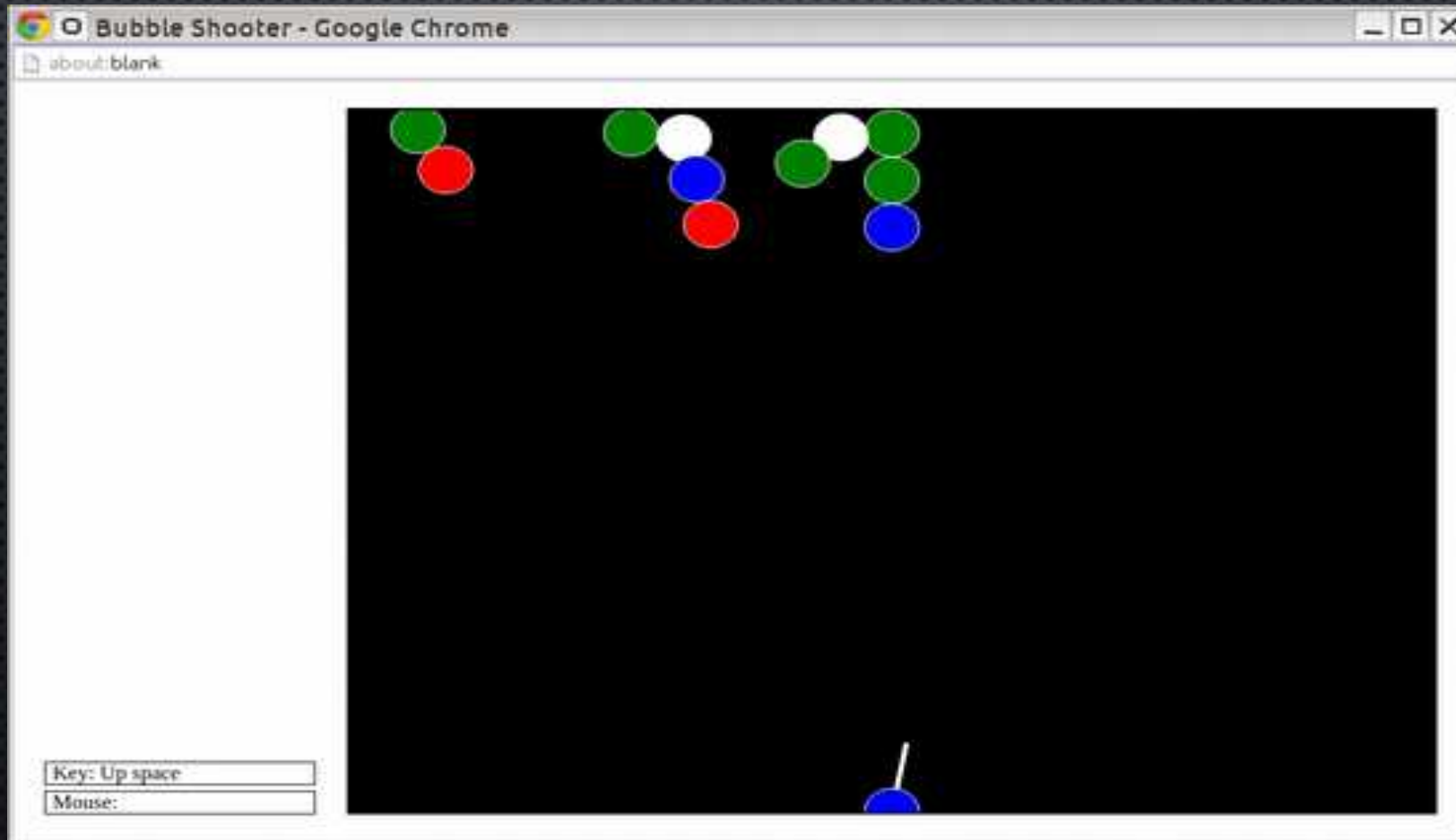


Bubble Shooter



Python. Codeskulptor.org

http://www.codeskulptor.org/#exercises_sets_final_solution.py



Python. Codeskulptor.org

http://www.codeskulptor.org/#user41_9Gi4euRkRj_0.py



Games. GeoGebra Book

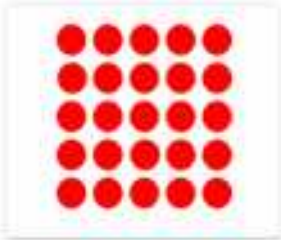
<https://www.geogebra.org/m/RrMgbg6T>

← GeoGebra

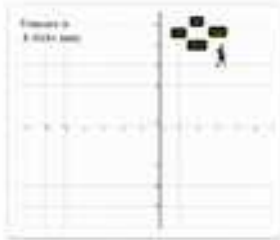
Games made in GeoGebra

- 2. Pirate Game
- 3. Guess My Rule (2013)
- 4. Angle Race
- 5. Log War
- 6. Dilaton Game
- 7. Rational Function Game
- 8. Dice Game Simulation
- 9. Boat Coordinate Game
- 10. Amazingly Simple PONG


1. Lights Out!



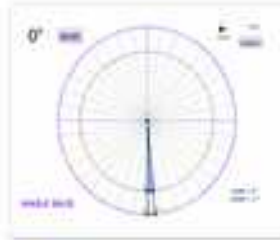
2. Pirate Game




3. Guess My Rule (2013)



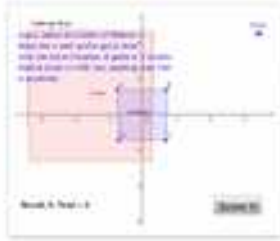
4. Angle Race




5. Log War




6. Dilaton Game




7. Rational Function Game




8. Dice Game Simulation



9. Boat Coordinate Game



10. Amazingly Simple PONG



Designing and Constructing Games

- Complex mathematical reasoning
- Programming and computational skills
- Technical knowledge
- Gamer experience

Mathematics Topics / Game Design Elements

- Vectors
 - Geometric transformation
 - Coordinate plane
 - Random numbers
 - ...
- Collision and Reflection
 - Acceleration and friction
 - Random walks
 - Controlled movements
 - ...

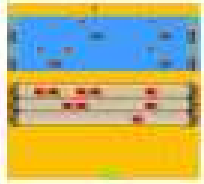
start with Game Design



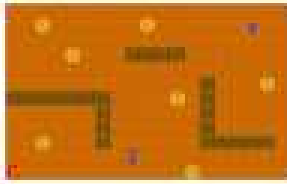
move on to Science Simulation

SCALABLE GAME DESIGN

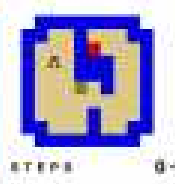
http://sgd.cs.colorado.edu/wiki/Scalable_Game_Design_wiki



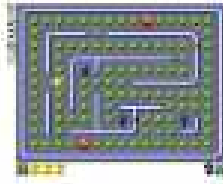
Frogger



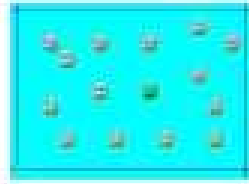
Journey



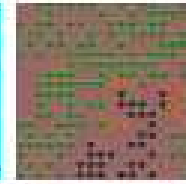
Sokoban



PacMan



Contagion



Forest Fire

Frogger is a good first game design activity for students with no programming background.

Journey is designed to present several computational thinking patterns in an incremental fashion.

Sokoban is a good second game design activity for students who have already completed the Frogger tutorials.

PacMan is a good first game design activity for high school students with no programming background.

More games: [Space Invaders](#) [Sims-like games](#) [AgentCubes games \(3D\) coming soon!](#)

The **Contagion** simulation approximates how contagions are spread among humans who are in close proximity to one another.

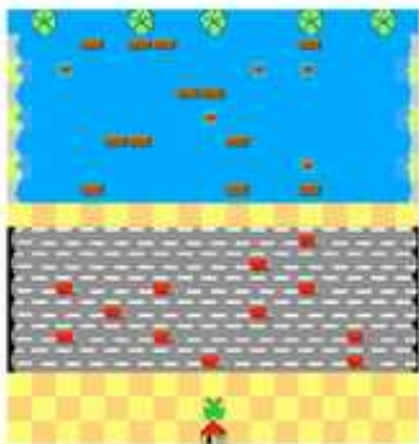
The **Forest Fire** simulation enables you to explore how forest fires unravel by letting you set fires to virtual forests with different parameters.

game



science simulation

phenomena



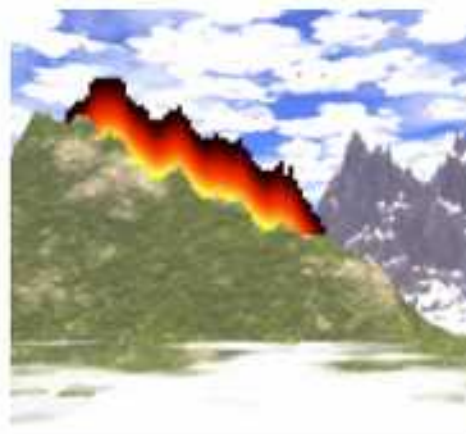
frogger

Michotte: "Perception of Causality"

launch:



collision, push, pull, diffusion, hill climbing, ...



avalanche

program

```
def add(x):
    return x+5

def describe(ast):
    nodename = getNodename()
    label=symbol.syn_name.get(id(ast[0]),ast[0])
    print "%s (%s)" % (nodename, label)
    if isinstance(ast[1], str):
        if ast[1].strip():
            print "%s" % ast[1]
        else:
            print ""
    else:
        print ""
        children = []
        for n, child in enumerate(ast[1:]):
            children.append(describe(child))
        print "%s -> [" % nodename,
        for name in children:
            print "%s" % name,
```

loop, if, then, else, print, ...

```
import sys
input leap?
if __name__=="__main__":
    if len(sys.argv)<2:
        print "Usage: %s <year> [year year...]"
        sys.exit(1)
    year = int(sys.argv[1])
    for i in range(10):
        year = getYear(i)
        print "%d leap?" % year
        if year % 4 != 0:
            print "No leap in the Julian calendar."
        elif year % 100 != 0 and year % 4 == 0:
            print "Yes leap in the Julian calendar."
        elif year % 400 != 0 and year % 100 == 0:
            print "No leap in the Gregorian calendar."
        else:
            print "Yes leap in the Gregorian calendar."
```