

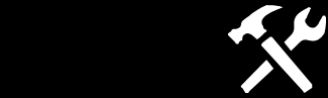
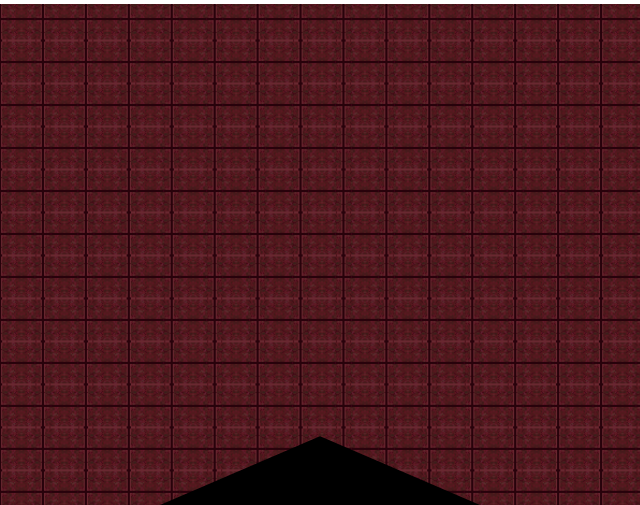
Projet 3

AIDEZ MACGYVER À
S'ÉCHAPPER !



Powered by Pygame et pourquoi Random ?

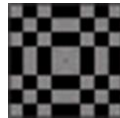
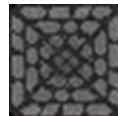
Projet 3 : Aidez MacGyver à s'échapper !



Création des sprites une par une.



Une heure de copier-coller avec Gimp.



Les personnages et les objets.

Aあ

Un peu de texte pour le menu.

Press ESCAPE at any time to quit the game

Press RETURN to start the game



MACGYVER
ESCAPE



Find MacGyver a route to the Guardian and
pick up 3 objects along the way to escape
the labyrinth.

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```
macgyverescape.py × classes.py × constants.py × lvi ×
1  -*- coding: utf-8 -*-
2
3  """
4  Constants file for macgyverescape.py aka Help MacGyver Escape Labyrinth
5  game.
6  """
7
8  # TODO: create window display parameters for game.
9  # Display window parameters =
10 sprite_size = 40
11 sprite_per_side = 15
12 display_per_side = sprite_per_side * sprite_size
13
14 # TODO: create game menu customization images list for import.
15 # Game Menu customization =
16 game_name = "MacGyver Escape"
17 image_icon = "images/macgyver.png"
18 image_game_menu = "images/game_menu.png"
19
20 # TODO: create labyrinth game images list for import.
21 # Game level background images =
22 image_background = "images/background.png"
23 image_start = "images/tile_start.png"
24 image_wall = "images/tile_wall.png"
25 image_end = "images/guardian.png"
26
27 # TODO: create characters game images list for import.
28 # Game Characters list =
29 ig_macgyver = "images/macgyver.png"
30 ig_murdoc = "images/guardian.png"
31
32 # TODO: create object list =
33 ig_object1 = "images/object_circuit.png"
34 ig_object2 = "images/object_chemistry.png"
35 ig_object3 = "images/object_electricity.png"
```

Projet 3 : Aidez MacGyver à s'échapper !

La Gestion des Constantes et de leurs Images.

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macgyverescape.py x classes.py x constants.py x lvl x

```
1 s000w0w0www0www
2 0ww000w00000000
3 00w0ww00ww0w0w0
4 0w00000www0w0w0
5 00www0ww0w000w
6 w000ww00w0www00
7 w0w0www00000ww
8 w0w0w0000www0w0
9 000ww0ww0w000w0
10 w0ww00000w0www0
11 w000www0w0000w
12 www0w0000www000
13 w000w0wwwww00w
14 w0www0w00000000
15 w00000www0wwwwe
```

Le Script de la Carte du Labyrinthe.

```
~/OpenClassrooms/Project_03/MacGyver_Escape/classes.py - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help

3 """Help MacGyver Escape Labyrinth game classes."""
4
5 # TODO: import libraries.
6
7 import pygame
8 from pygame.locals import *
9 from constants import *
10 from random import *
11
12
13 # TODO: create class Level to generate game level & display it from read file.
14 class Level:
15     """Class to create a level in the game."""
16     def __init__(self, file):
17         # Define attribute file (for lvl).
18         self.file = file
19         # Define attribute grid.
20         self.grid = 0
21         # define attribute empty tuples list which runs twice: once for--
22         # --columns & once for lines (x,y) for the empty spots in the--
23         # --labyrinth where the in game objects can randomly spawn.
24         self.free = [] # free = free sprites.
25
26 # Method 1 = generates a game level according to lvl file in an--
27 # --attribute 'structure'.
28 def generate(self):
29     """Method which generates a game level according to the file read.
30     We create a general list containing a line per line list to display."""
31
32     # Open the file and read ('r') it.
33     with open(self.file, 'r') as file:
34         grid_level = []
35         # Initialize coordinates at -1 because the grid starts at 0--
36         # --and I will append +1 to columns and lines.
37         x = -1
38         y = -1
39         # Run the lines in the file.
40         for line in file:
41             line_level = []
42             # Run each line in the file.
43             for sprite in line:
44                 # A new line starts, columns reset.
45                 x = -1
46                 # Run each sprite/letters in the file.
47                 for sprite in line:
48                     # Count the columns in the grid.
49                     x += 1
```

Class Level

Method generate : pour créer la grille du labyrinthe et la liste des cases libres pour le placement des objets en jeu.

```
~/OpenClassrooms/Project_03/MacGyver_Escape/classes.py - Sublime Text (UNREGISTERED)
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49
50 x += 1
51 # Ignore '\n' at the end of each line (not a sprite)
52 if line != '\n':
53     # Add sprite to lines list
54     line_level.append(sprite)
55     # Check if sprite is a free spot in the grid.
56     if sprite == '0':
57         # If sprite is free add sprite to list free.
58         self.free.append((x,y))
59     # Add lines to level list.
60     grid_level.append(line_level)
61 # Save the grid.
62 self.grid = grid_level
63 # Print the structure of the grid in terminal.
64 print(self.grid)
65
66 # Method 2 = displays labyrinth aka game level (we only have one).
67 def display(self, display):
68     """Method which displays game level according to grid list returned
69     by generate() """
70
71     # Load images.
72     wall = pygame.image.load(image_wall).convert()
73     start = pygame.image.load(image_start).convert()
74     # convert_alpha for transparent images.
75     end = pygame.image.load(image_end).convert_alpha()
76
77     # Run level list.
78     line_nb = 0
79     for line in self.grid:
80         # Run lines lists.
81         sprite_nb = 0
82         for sprite in line:
83             # Calculate real position in pixels per column.
84             x = sprite_nb * sprite_size
85             # Calculate real position in pixels per line.
86             y = line_nb * sprite_size
87             if sprite == 'w': # w = wall.
88                 display.blit(wall, (x,y))
89             elif sprite == 's': # s = start
90                 display.blit(start, (x,y))
91             elif sprite == 'e': # e = end
92                 display.blit(end, (x,y))
93             # Add one sprite.
94             sprite_nb += 1
95         # Add one line.
96         line_nb += 1
```

Class Level

Method display : pour afficher la carte que l'on a générée pour le labyrinthe.

Projet 3 : Aidez MacGyver à s'échapper !

```
~/OpenClassrooms/Project_03/MacGyver_Escape/classes.py - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
macgyverescape.py x classes.py x constants.py x lvl x
98 # TODO: create class Character to display MacGyver and make him move.
99 class Character:
100     """Class that creates a character."""
101
102     # Define MacGyver with self attributes =
103     def __init__(self, face, level):
104         # Character sprite (convert_alpha = transparency)
105         self.face = pygame.image.load(ig_macgyver).convert_alpha()
106         # Character's position in sprites
107         self.sprite_x = 0
108         self.sprite_y = 0
109         # Character's position in pixels
110         self.x = 0
111         self.y = 0
112         # Game level character is in (we only have the one here)
113         self.level = level
114         # Counter for the 3 in game objects MacGyver must pick up.
115         self.ig_object = 0
116
117     # Method 1 = to move MacGyver in the game
118     def move(self, direction):
119         """Method to move MacGyver and to pick up in game objects."""
120
121         # Check if MacGyver is on a sprite that has an in game object on it.
122         # 'i' = item.
123         if self.level.grid[self.sprite_y][self.sprite_x] == 'i':
124             print("I've picked up an object! YESSS!!!")
125             # Add 1 to in game object counter.
126             self.ig_object += 1
127             print("I have {} objects.".format(self.ig_object))
128             # Replace 'i' (item sprite) by '0' (free sprite) on the background.
129             # --to make in game objects disappear.
130             # --them up.
131             self.level.grid[self.sprite_y][self.sprite_x] = '0'
132
```

Class Character

La création, l'affichage et la position de MacGyver, ainsi que la définition du compteur d'objets en jeu.

```
~/OpenClassrooms/Project_03/MacGyver_Escape/classes.py - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
Cécile Godefroy
macgyverescape.py x classes.py x constants.py x lvl x
132
133     # Moving right
134     if direction == 'right':
135         # Make sure MacGyver doesn't go past the screen
136         if self.sprite_x < (sprite_per_side - 1):
137             # Checks destination sprite is not a wall
138             if self.level.grid[self.sprite_y][self.sprite_x+1] != 'w':
139                 # Move one sprite
140                 self.sprite_x += 1
141                 # Computing of MacGyver's 'real' position in pixels
142                 self.x = self.sprite_x * sprite_size
143
144     # Moving left
145     if direction == 'left':
146         if self.sprite_x > 0:
147             if self.level.grid[self.sprite_y][self.sprite_x-1] != 'w':
148                 self.sprite_x -= 1
149                 self.x = self.sprite_x * sprite_size
150
151     # Moving up
152     if direction == 'up':
153         if self.sprite_y > 0:
154             if self.level.grid[self.sprite_y-1][self.sprite_x] != 'w':
155                 self.sprite_y -= 1
156                 self.y = self.sprite_y * sprite_size
157
158     # Moving down
159     if direction == 'down':
160         if self.sprite_y < (sprite_per_side - 1):
161             if self.level.grid[self.sprite_y+1][self.sprite_x] != 'w':
162                 self.sprite_y += 1
163                 self.y = self.sprite_y * sprite_size
164
```

Class Character

Method move : pour le ramassage des objets et les mouvements de MacGyver.

Projet 3 : Aidez MacGyver à s'échapper !

```

165
166 class Item:
167     """Class that creates the in games items useful to the hero."""
168
169     # Define 3 objects =
170     def __init__(self, level, n):
171
172         # Choose a random sprite in list free for a random spot the in game--
173         # --object can spawn on.
174         position = choice(level.free) # Choice = random library.
175         # Define position x for random in game object
176         self.sprite_x = position[0]
177         # Define position y for random in game object
178         self.sprite_y = position[1]
179
180         # Change sprite type '0' for sprite type 'i' so that in game objects--
181         # --do not spawn on top of each other and they disappear when--
182         # --MacGyver picks them up.
183         # Grid is a list of list with form [[ line1], [line2],..., [line15]]--
184         # --where each line is a list.
185         # New line y and column x.
186         level.grid[self.sprite_y][self.sprite_x] = 'i'
187         # Print grid to visualize the free sprites 'i'.
188         print(level.grid)
189
190         # n means number and represents an attribute number strictly between--
191         # --1 and 3 that are the in game objects/items.
192         if n == 1 : # ig_object1.
193             self.face = pygame.image.load(ig_object1).convert_alpha()
194
195         elif n == 2 : # ig_object2.
196             self.face = pygame.image.load(ig_object2).convert_alpha()
197
198         elif n == 3 : #ig_object3.
199             self.face = pygame.image.load(ig_object3).convert_alpha()
200
201         # Item position in pixels.
202         self.x = self.sprite_x * sprite_size
203         self.y = self.sprite_y * sprite_size
204         # Game level items are in (we only have the one here).
205         self.level = level

```

Class Item

Le choix aléatoire de la position
des objets et leur affichage.



macgyverescape.py x

classes.py x

constants.py x

lvl x



```
1  -*- coding: utf-8 -*-
2
3  """
4  Helping MacGyver Escape Labyrinth Game.
5
6  In this game, the player must pick up 3 objects along the way in the labyrinth
7  then progress to face the guardian so they can escape and end the game.
8
9  Script: Python3
10 Files: macgyverescape.py, classes.py, constants.py, lvl + images
11 """
12
13 # TODO: import libraries.
14 import pygame
15 from pygame.locals import *
16 from random import *
17
18 from classes import *
19 from constants import *
20
21 # TODO: initialize Pygame library.
22 pygame.init()
23
24 # TODO: open game display window.
25 display = pygame.display.set_mode((display_per_side, display_per_side))
26 # Game icon.
27 icon = pygame.image.load(image_icon)
28 pygame.display.set_icon(icon)
29 # Game title.
30 pygame.display.set_caption(game_name)
31 # Allow continuous pressing of movement keys in the game display window.
32 pygame.key.set_repeat(400, 30) # Delay in millisec of how long a key is--
33 # --pressed before char. mvt & time in millisec between each char. mvt.
34
```

L'affichage Initial du Jeu.

macgyverescape.py ×

classes.py ×

constants.py ×

lvl ×

```
34
35 # TODO: create game global loop = algorithm.
36 carry_on = 1
37 while carry_on:
38     # Load and display game menu.
39     game_menu = pygame.image.load(image_game_menu).convert()
40     display.blit(game_menu, (0,0))
41
42     # Refresh.
43     pygame.display.flip()
44
45     # Reset variables to 1 every lap of the loop.
46     carry_on_game = 1
47     carry_on_game_menu = 1
48
49     # TODO: create game menu loop.
50     while carry_on_game_menu:
51
52         # Limit loop speed.
53         pygame.time.Clock().tick(30)
54
55         # TODO: give user possibility to choose event in game menu.
56         for event in pygame.event.get():
57
58             # If user quits, variables in game menu loop all go to 0.
59             if event.type == QUIT or event.type == KEYDOWN and event.key == K_ESCAPE:
60                 carry_on_game_menu = 0
61                 carry_on_game = 0
62                 carry_on = 0
63                 choice = 0 # Variable for choice in game menu.
64
65             # Launch game level aka labyrinth.
66             elif event.type == KEYDOWN and event.key == K_RETURN:
67                 # User leaves game_menu and starts to play.
68                 carry_on_game_menu = 0
69                 # Loads labyrinth as designed in file read 'lvl'.
70                 choice = 'lvl'
71
```

Le Menu du Jeu et le Choix de l'Utilisateur.

Projet 3 : Aidez MacGyver à s'échapper !

File Edit Selection Find View Goto Tools Project Preferences Help

macgyverescape.py x

classes.py x

constants.py x

lvl x

```
71
72 # While in loop, check if user chose to play so as not to load the game.
73 # If they chose to quit.
74 if choice != 0:
75     # Then load background.
76     background = pygame.image.load(image_background).convert()
77
78     # Generate game level from file.
79     level = Level(choice)
80     level.generate()
81     level.display(display)
82
83     # Generate MacGyver.
84     macgyver = Character(ig_macgyver, level)
85
86     # Generate the items MacGyver must pick up.
87     object1 = Item(level,1)
88     object2 = Item(level,2)
89     object3 = Item(level,3)
90
```

Générer le Labyrinthe, MacGyver et les Objets en Jeu.

Projet 3 : Aidez MacGyver à s'échapper !

macgyverescape.py x

classes.py x

constants.py x

lvl x

```
91 # TODO: Create game loop.
92 while carry_on_game:
93
94     # Limit loop speed.
95     pygame.time.Clock().tick(30)
96
97     for event in pygame.event.get():
98
99         # If user quits game then turn carry_on_game & carry_on to 0 to -
100         # --close display window.
101         if event.type == QUIT:
102             carry_on_game = 0
103             carry_on = 0
104
105         elif event.type == KEYDOWN:
106             # If user presses ESCAPE = return to Game_Menu.
107             if event.key == K_ESCAPE:
108                 carry_on_game = 0
109                 carry_on = 1
110
111             # If user uses arrow keys then move MacGyver.
112             elif event.key == K_RIGHT:
113                 macgyver.move('right')
114             elif event.key == K_LEFT:
115                 macgyver.move('left')
116             elif event.key == K_UP:
117                 macgyver.move('up')
118             elif event.key == K_DOWN:
119                 macgyver.move('down')
120
121         # Display new positions.
122         display.blit(background, (0,0))
123         level.display(display)
124         display.blit(macgyver.face, (macgyver.x, macgyver.y))
125
```

Boucle for pour les Mouvements de MacGyver.

Projet 3 : Aidez MacGyver à s'échapper !


```
125
126 # Display in game objects only if there is 'i' for free item sprite.
127 if level.grid[object1.sprite_y][object1.sprite_x] == 'i':
128     display.blit(object1.face, (object1.x, object1.y))
129 if level.grid[object2.sprite_y][object2.sprite_x] == 'i':
130     display.blit(object2.face, (object2.x, object2.y))
131 if level.grid[object3.sprite_y][object3.sprite_x] == 'i':
132     display.blit(object3.face, (object3.x, object3.y))
133
134 # Refresh.
135 pygame.display.flip()
136
137 # TODO: Victory Loop.
138 # MacGyver is on the end sprite.
139 if level.grid[macgyver.sprite_y][macgyver.sprite_x] == 'e':
140     # Labyrinth loop ends.
141     carry_on_game = 0
142     # Global game loop carries on.
143     carry_on = 1
144     # Back to game menu for user choice.
145     carry_on_game_menu = 1
146     # If MacGyver has collected 3 in game objects.
147     if macgyver.ig_object == 3:
148         print("You won!")
149     else:
150         print("You lost...")
151     # Resetting in game object counter to 0.
152     macgyver.ig_object = 0
153
154 # Display new position.
155 display.blit(game_menu, (0,0))
```

Affichage des Objets en Jeu et la Boucle de la Victoire.



File Edit View Search Terminal Help

cecilesg@C-U1804: ~/OpenClassrooms/Project_03/MacGyver_Escape\$ python3 macgyverescape.py

Cécile Godefroy

Developed on Linux Ubuntu 1804.

cecilesg@C-U1804: ~/OpenClassrooms/Project_03/MacGyver_Escape\$

python3
macgyver
escape.py

Powered by Pygame.

'w', 'w', 'e']]
I've picked up an object! YESSS!!!
I have 1 objects.
I've picked up an object! YESSS!!!
I have 2 objects.
I've picked up an object! YESSS!!!
I have 3 objects.
You won!

Projet 3 : Aidez MacGyver à s'échapper !

Génération des objets en jeu.

Ramassage des objets en jeu ou leur disparition.

Affichage aléatoire des objets en jeu.

[illegible]



Pression continue
des touches de
déplacement.

Retour de
l'utilisateur au
menu qu'il perde
ou qu'il gagne.

Messages dans la
console.

Petites choses qui améliorent le jeu !



Trois Idées.

1. Un compteur des vies de Macgyver et pour les objets ramassés.
2. Tuer MacGyver et un visuel de défaite si l'utilisateur ne remplit pas les conditions pour la victoire.
3. Générer, afficher et rendre aléatoire plus que 3 objets pour rendre le jeu plus intéressant.

A background image of MacGyver underwater, wearing his signature goggles and a white shirt. He is holding a large, orange, cross-shaped object. The water is blue and slightly murky. The word 'MACGYVER' is written in a stylized, metallic font at the bottom of the image.

The end! Merci.