The Antidote

Python Game Design

Time: 60 mins

Introduction

In this class, student/s will learn to decrease the antidote count. Student/s will also learn to add game states to continue or restart the game and display images to instruct.

Python Commands Introduced

- else — Executes the False part of a condition

Vocabulary

- **Game states:** A series of game events at an instant make up a game state. The change of game state from one value to another is also known as game transition.
- **"continue"** is a user-defined game state which allows the player to continue playing the game while the antidote count is greater than 0.
- **"over"** is a user-defined game state which allows the player to restart the game when the antidote count reduces to 0.
- **ASCII** stands for American Standard Code for Information Interchange. A unique number is used to represent the numbers from 0-9, lower case letters a-z, upper case letters A-Z, and some special characters. Below is the reference ASCII table:

ASCII TABLE

Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char
0	0	[NULL]	32	20	[SPACE]	64	40	@	96	60	`
1	1	[START OF HEADING]	33	21	!	65	41	A	97	61	a
2	2	[START OF TEXT]	34	22	"	66	42	B	98	62	b
3	3	[END OF TEXT]	35	23	#	67	43	C	99	63	c
4	4	[END OF TRANSMISSION]	36	24	$	68	44	D	100	64	d
5	5	[ENQUIRY]	37	25	%	69	45	E	101	65	e
6	6	[ACKNOWLEDGE]	38	26	&	70	46	F	102	66	f
7	7	[BELL]	39	27	'	71	47	G	103	67	g
8	8	[BACKSPACE]	40	28	(	72	48	H	104	68	h
9	9	[HORIZONTAL TAB]	41	29	)	73	49	I	105	69	i
10	A	[LINE FEED]	42	2A	*	74	4A	J	106	6A	j
11	B	[VERTICAL TAB]	43	2B	+	75	4B	K	107	6B	k
12	C	[FORM FEED]	44	2C	,	76	4C	L	108	6C	l
13	D	[CARRIAGE RETURN]	45	2D	-	77	4D	M	109	6D	m
14	E	[SHIFT OUT]	46	2E	.	78	4E	N	110	6E	n
15	F	[SHIFT IN]	47	2F	/	79	4F	O	111	6F	o
16	10	[DATA LINK ESCAPE]	48	30	0	80	50	P	112	70	p
17	11	[DEVICE CONTROL 1]	49	31	1	81	51	Q	113	71	q
18	12	[DEVICE CONTROL 2]	50	32	2	82	52	R	114	72	r
19	13	[DEVICE CONTROL 3]	51	33	3	83	53	S	115	73	s
20	14	[DEVICE CONTROL 4]	52	34	4	84	54	T	116	74	t
21	15	[NEGATIVE ACKNOWLEDGE]	53	35	5	85	55	U	117	75	u
22	16	[SYNCHRONOUS IDLE]	54	36	6	86	56	V	118	76	v
23	17	[ENG OF TRANS. BLOCK]	55	37	7	87	57	W	119	77	w
24	18	[CANCEL]	56	38	8	88	58	X	120	78	x
25	19	[END OF MEDIUM]	57	39	9	89	59	Y	121	79	y
26	1A	[SUBSTITUTE]	58	3A	:	90	5A	Z	122	7A	z
27	1B	[ESCAPE]	59	3B	;	91	5B	[	123	7B	{
28	1C	[FILE SEPARATOR]	60	3C	<	92	5C	\	124	7C	|
29	1D	[GROUP SEPARATOR]	61	3D	=	93	5D	]	125	7D	}
30	1E	[RECORD SEPARATOR]	62	3E	>	94	5E	^	126	7E	~
31	1F	[UNIT SEPARATOR]	63	3F	?	95	5F	_	127	7F	[DEL]

Learning Objectives

Student/s should be able to:

- ***Recall*** the concept of variables, ASCII value, and keypress events.
- ***Describe*** how to add and update game states in the game.
- ***Explain*** how to detect collisions between two game objects.
- ***Program*** different game transitions when the game begins, continues, and ends.

Activities

1. **Class Narrative:** *(2 mins)*
    - Brief the student/s that Dr. Cleo can now bring back the zombies into their human form using the restorative serum.
    - Ask the student/s how Dr. Cleo was unaffected by exposure to the gas leak.

2. **Concept Introduction Activity:** *(5 mins)*
    - Let the student/s play the explore-activity using arrow keys and observe how the antidote helps Dr. Cleo.
    - Brief the student/s using slides that
        - Dr. Cleo lost an antidote on collision with a zombie or on falling off the platform.
        - The game can be played only till antidotes are available.
        - The game ends when there are no antidotes left.

      Note: The game state "continue" and "over" are decided by the number of antidotes.
    - Using the slides, explain:

    - How to decrease the antidote count
    - How to continue the game
    - How to restart the game

3. **Activity 1: Decrease the Antidote Count :** *(10 mins)*

   Teacher Activity: *(5 mins)*
   - Explain to the student/s how to define a game state and decrease the antidote count by 1 when Dr. Cleo collides with a zombie.

   Student Activity: *(5 mins)*
   - Guide the student/s to decrease the antidote count by 1 and change the game state to "over" when Dr. Cleo falls off the platform.

4. **Activity 2: Continue the Game :** *(10 mins)*

   Student Activity: *(10 mins)*
   Probing question: What is the ASCII key code for the "C" key?
   Expected answer: 67
   - Guide the student/s to display a “Antidotes Remaining” image when the game state is "continue" and the antidote count is greater than 0.
   - Guide the student/s to continue the game when the "C" key is pressed. Reposition Dr. Cleo to the nearest platform behind the current position using the helper function getNearestPlatform(cleo, platforms). This function will iterate through the list named platforms and return the x position which is lesser than the position at which Dr. Cleo fell off.
     Note: Let the student experiment with the number of antidotes left.

5. **Activity 3: Restart the Game :** *(10 mins)*

   Student Activity: *(10 mins)*
   - Guide the student/s to restart the game when the antidotes count reaches 0 and if the "R" key is pressed.
     Note: The ASCII key code for the “R” key is 82.

6. **Introduce the Post class project:** *(2 min)*
   - In the Tank Wreck game, add the "over" game state when the tank gets busted.

7. **Test and Summarize the class learnings:** *(5 mins)*
   - Check for understanding through quizzes and summarize learning after respective missions.
   - Summarize the overall class learning towards the end of the class.

8. **Additional activities:**
   - Encourage the student/s to display a “start the game” image and add a new game state to start the game.
   - Encourage the student/s to add Dr. Cleo and the platform to the game in the initial game state.

9. **State the Next Class Objective:** *(1 min)*
   - We will learn to defeat the monster zombie and allow Dr. Cleo to reach the lab to end the zombie apocalypse.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-14

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	The Antidote	https://s3-whjr-curriculum-uploads.whjr.online/c2809b47-b7cc-4d08-87d3-7774beab18ad.html
Explore Activity	The Antidote : Explore Activity	https://tynker.com/code/view/636dc7b56329dd315542a252/
Teacher Activity 1	Decrease the Antidote Count	https://tynker.com/code/project/632bd68b075ac17efd46df32
Teacher Activity 1 Solution	Decrease the Antidote Count - Solution	https://tynker.com/code/project/632bd5b2dd40504dd71cb512
Student Activity 1	Decrease the Antidote Count	https://tynker.com/code/project/632bd4cf2f7da16a2f286dd2
Teacher Reference: Student Activity 1 Solution	Decrease the Antidote Count - Solution	https://tynker.com/code/project/632bd39ce191f51ee6135a02
Student Activity 2.1	Check if Antidotes are Remaining	https://tynker.com/code/project/632bd3509eb6e2149f3e7592
Teacher Reference: Student Activity 2.1 Solution	Check if Antidotes are Remaining - Solution	https://tynker.com/code/project/632b4a19f8e5154682592e22
Student Activity 2.2	Continue the Game	https://tynker.com/code/project/636df0976679e56a17605b72
Teacher Reference: Student Activity 2.2 Solution	Continue the Game - Solution	https://tynker.com/code/project/632b494ae922134c9f27bbf2
Student Activity 3	Restart the Game	https://tynker.com/code/project/632b487b07e8bf7c05777033
Teacher Reference: Student Activity 3 Solution	Restart the Game - Solution	https://tynker.com/code/project/636dc7b56329dd315542a252
Student"s Additional Activity 1	Start the Game by Pressing the Spacebar	https://tynker.com/code/project/6335aa75e6e7796ce42b9ea2
Teacher Reference: Student"s Additional Activity 1 Solution	Start the Game by Pressing the Spacebar - Solution	https://tynker.com/code/project/6335860f5e6a9e2b3c2aa5a2
Student"s Additional Activity 2	Display Objects in the Initial State	https://tynker.com/code/project/6335b6b256f9e75e9374c2c2
Teacher Reference: Student"s Additional Activity 2 Solution	Display Objects in the Initial State - Solution	https://tynker.com/code/project/6335b60678e66c148f5ef192

Post Class Project	Tank Wreck - III	https://tynker.com/code/project/63512d24430f7c2eb02be3d2
Teacher Reference: Post Class Project Solution	Tank Wreck - III - Solution	https://tynker.com/code/project/634fb11f4be945261f278852