# Coder's Corner

02.28.2019 - Math Extravaganza

## What are we doing here?

Programmers all over the world are coding solutions to problems using technology. A small part of that is working through challenges in the code they write to get the machine (whether it's your phone, your computer or even your refrigerator) to perform specific tasks that help make your life easier. Today, we're walking you through a small example of that to give all of you high school students a sneak peak into the wonderful world of coding.

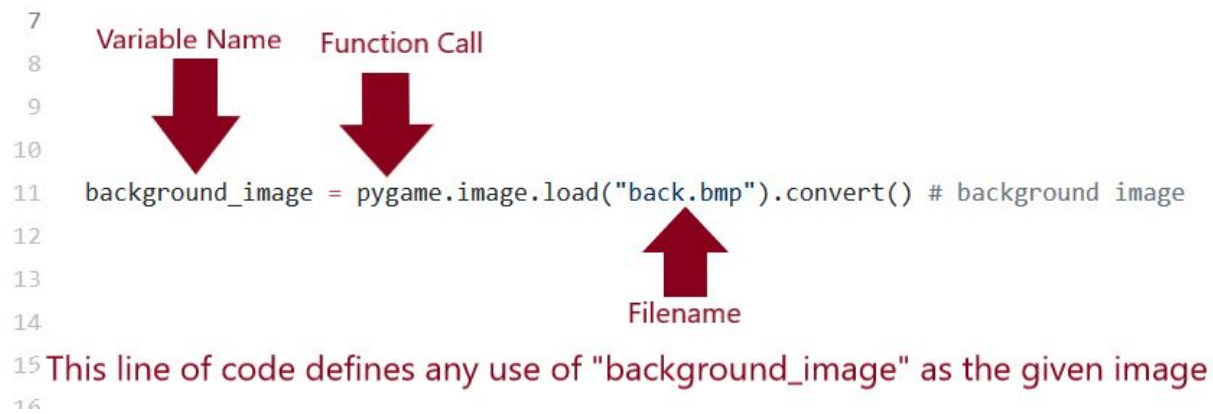
## What's the challenge?

Modify the provided PyGame program ( **JumpPhysicsTemplate.py** ) in the following ways and win prizes!

## Step-by-step

1. Increase Character Velocities/Accelerations
2. Change Character Appearance
3. Change Background
4. Change buttons used (WASD instead of the mouse, Arrow keys, etc)
5. Change Dimensions of Window (This is going to be a little trickier than it looks, make sure the game works as expected when you think you've completed it)
6. Add obstacles and add a collision mechanic (such as stopping the player when you collide with obstacles)
7. Make the game play as if you are underwater (Assume the character is floating to the surface)
8. Some other fun changes!

# Helpful Notes for PyGames:




**Key Press Variables:** (Look at how we use MOUSEBUTTONDOWN)

| | | |
|---|---|---|
| K_SPACE | | space |
| K_EXCLAIM | ! | exclaim |
| K_QUOTEDBL | " | quotedbl |
| K_HASH | # | hash |
| K_DOLLAR | $ | dollar |
| K_AMPERSAND | & | ampersand |
| K_QUOTE | | quote |
| K_LEFTPAREN | ( | left parenthesis |
| K_RIGHTPAREN | ) | right parenthesis |
| K_ASTERISK | * | asterisk |
| K_PLUS | + | plus sign |
| K_COMMA | , | comma |
| K_MINUS | - | minus sign |
| K_PERIOD | . | period |
| K_SLASH | / | forward slash |
| K_0 | 0 | 0 |
| K_1 | 1 | 1 |
| K_2 | 2 | 2 |
| K_3 | 3 | 3 |
| K_4 | 4 | 4 |
| K_5 | 5 | 5 |
| K_6 | 6 | 6 |
| K_7 | 7 | 7 |
| K_8 | 8 | 8 |
| K_9 | 9 | 9 |
| K_COLON | : | colon |
| K_SEMICOLON | ; | semicolon |
| K_LESS | < | less-than sign |
| K_EQUALS | = | equals sign |
| K_GREATER | > | greater-than sign |
| K_QUESTION | ? | question mark |
| K_AT | @ | at |
| K_LEFTBRACKET | [ | left bracket |
| K_BACKSLASH | \ | backslash |
| K_RIGHTBRACKET | ] | right bracket |
| K_CARET | ^ | caret |
| K_UNDERSCORE | _ | underscore |
| K_BACKQUOTE | ` | grave |
| K_a | a | a |
| K_b | b | b |
| K_c | c | c |
| K_d | d | d |
| K_e | e | e |
| K_f | f | f |
| K_g | g | g |

| | | |
|---|---|---|
| K_h | h | h |
| K_i | i | i |
| K_j | j | j |
| K_k | k | k |
| K_l | l | l |
| K_m | m | m |
| K_n | n | n |
| K_o | o | o |
| K_p | p | p |
| K_q | q | q |
| K_r | r | r |
| K_s | s | s |
| K_t | t | t |
| K_u | u | u |
| K_v | v | v |
| K_w | w | w |
| K_x | x | x |
| K_y | y | y |
| K_z | z | z |
| K_DELETE | | delete |
| K_KP0 | | keypad 0 |
| K_KP1 | | keypad 1 |
| K_KP2 | | keypad 2 |
| K_KP3 | | keypad 3 |
| K_KP4 | | keypad 4 |
| K_KP5 | | keypad 5 |
| K_KP6 | | keypad 6 |
| K_KP7 | | keypad 7 |
| K_KP8 | | keypad 8 |
| K_KP9 | | keypad 9 |
| K_KP_PERIOD | . | keypad period |
| K_KP_DIVIDE | / | keypad divide |
| K_KP_MULTIPLY | * | keypad multiply |
| K_KP_MINUS | - | keypad minus |
| K_KP_PLUS | + | keypad plus |
| K_KP_ENTER | \r | keypad enter |
| K_KP_EQUALS | = | keypad equals |
| K_UP | | up arrow |
| K_DOWN | | down arrow |
| K_RIGHT | | right arrow |
| K_LEFT | | left arrow |
| K_INSERT | | insert |
| K_HOME | | home |
| K_END | | end |
| K_PAGEUP | | page up |
| K_PAGEDOWN | | page down |