

3 a.**3.a.i.**

The purpose of this program is to entertain the user through a fun obstacle course in which the user has to move a red ball from the starting point to a golden mushroom without bumping into the walls, and while also earning points.

3.a.ii.

The video shows the game running with the red ball at a speed of 2x, and also at the speed of 3x. The video illustrates how each time the user's red ball bumped into a wall the ball was back at the starting position and the game restarted. The video also shows the end results page for the first run of the game in which the player earned 200 points, and took two tries to finish.

3.a.iii.

The inputs of this program include the mouse keys which move the red ball throughout the screen, and the mouse clicks used to proceed from the welcome screen, and the message banners that the program outputs. The program also outputs a result screen with the number of points the user earned, and the tries that they took to finish.

3 b.**3.b.i.**

```
score_point_list = [(360,40), (315,175), (345,310), (30,100), (135,310), (285,310)]
```

3.b.ii.

```
for i in range(6):
    if (score_point_list[i][0] == character.get_x()) and (score_point_list[i][1] == character.get_y()):
        add(sign_two)
        add(alert)
        add(alert_part_two)
        sign_two.set_position((get_width()/2)-150, (get_height()/2)-150)
        alert.set_position(90, (get_height()/2)-75)
        alert_part_two.set_position((get_width()/2)-120, (get_height()/2)-50)
        add_mouse_click_handler(restarts)
        score_list.append(1)
```

3.b.iii.

The list being processed is named `score_point_list`.

3.b.iv.

The `score_point_list` contains the coordinates of all the stars and mystery blocks which allows the program to identify where these items that give the user points are located.

3.b.v.

As shown in the second image, the list manages complexity in the program as it allows it to check if the user moved the red ball onto the stars or the mystery blocks all at once in a much quicker manner, through the use of a for loop and an if statement. If not for the list, I would've had to create several separate if statements for each of the different coordinate points stored in the list, and check if that equals the current location of the red ball. The list allows the for loop to access a different coordinate point each time the loop runs, allowing it to check through the whole list to see if the current coordinates of red ball equals one of the coordinates stored in the list.

```

274 def move_character(event, name, speed):
275     global final_score
276     name_box = Text(name)
277     name_box.set_position(3,15)
278     name_box.set_font("10pt Arial")
279     add(name_box)
280     if event.key == "ArrowLeft":
281         character.move((speed*-1), 0)
282         for i in range(len(block_list)):
283             if (block_list[i][0] == character.get_x() and (block_list[i][1] == character.get_y())):
284                 add(sign)
285                 add(warning)
286                 add(warning_part_two)
287                 character.set_position(15,55)
288                 add(character)
289                 add_mouse_click_handler(restarts)
290                 sign.set_position((get_width()/2)-150, (get_height()/2)-150)
291                 warning.set_position((get_width()/2)-140, (get_height()/2)-75)
292                 warning_part_two.set_position((get_width()/2)-120, (get_height()/2)-50)
293                 tries_list.append(1)
294                 for i in range(len(score_list)):
295                     score_list.remove(1)
296             for i in range(6):
297                 if (score_point_list[i][0] == character.get_x() and (score_point_list[i][1] == character.get_y())):
298                     add(sign_two)
299                     add(alert)
300                     add(alert_part_two)
301                     sign_two.set_position((get_width()/2)-150, (get_height()/2)-150)
302                     alert.set_position(90, (get_height()/2)-75)
303                     alert_part_two.set_position((get_width()/2)-120, (get_height()/2)-50)
304                     add_mouse_click_handler(restarts)
305                     score_list.append(1)
306     elif event.key == "ArrowRight":
307         character.move(speed, 0)
308         for i in range(len(block_list)):
309             if (block_list[i][0] == character.get_x() and (block_list[i][1] == character.get_y())):
310                 add(sign)
311                 add(warning)
312                 add(warning_part_two)
313                 character.set_position(15,55)
314                 add(character)
315                 add_mouse_click_handler(restarts)
316                 sign.set_position((get_width()/2)+150, (get_height()/2)-150)
317                 warning.set_position((get_width()/2)+140, (get_height()/2)-75)
318                 warning_part_two.set_position((get_width()/2)+120, (get_height()/2)-50)
319                 tries_list.append(1)
320                 for i in range(len(score_list)):
321                     score_list.remove(1)
322             for i in range(6):
323                 if (score_point_list[i][0] == character.get_x() and (score_point_list[i][1] == character.get_y())):
324                     add(sign_two)
325                     add(alert)
326                     add(alert_part_two)
327                     sign_two.set_position((get_width()/2)+150, (get_height()/2)-150)
328                     alert.set_position(90, (get_height()/2)-75)
329                     alert_part_two.set_position((get_width()/2)+120, (get_height()/2)-50)
330                     add_mouse_click_handler(restarts)
331                     score_list.append(1)
332     elif event.key == "ArrowUp":
333         character.move(0, (speed*-1))
334         for i in range(len(block_list)):
335             if (block_list[i][0] == character.get_x() and (block_list[i][1] == character.get_y())):
336                 add(sign)
337                 add(warning)
338                 add(warning_part_two)
339                 character.set_position(15,55)
340                 add(character)
341                 add_mouse_click_handler(restarts)
342                 sign.set_position((get_width()/2)-150, (get_height()/2)+150)
343                 warning.set_position((get_width()/2)-140, (get_height()/2)+75)
344                 warning_part_two.set_position((get_width()/2)-120, (get_height()/2)+50)
345                 tries_list.append(1)
346                 for i in range(len(score_list)):
347                     score_list.remove(1)
348             for i in range(6):
349                 if (score_point_list[i][0] == character.get_x() and (score_point_list[i][1] == character.get_y())):
350                     add(sign_two)
351                     add(alert)
352                     add(alert_part_two)
353                     sign_two.set_position((get_width()/2)-150, (get_height()/2)+150)
354                     alert.set_position(90, (get_height()/2)+75)
355                     alert_part_two.set_position((get_width()/2)-120, (get_height()/2)+50)
356                     add_mouse_click_handler(restarts)
357                     score_list.append(1)
358     elif event.key == "ArrowDown":
359         character.move(0, speed)
360         for i in range(len(block_list)):
361             if (block_list[i][0] == character.get_x() and (block_list[i][1] == character.get_y())):
362                 add(sign)
363                 add(warning)
364                 add(warning_part_two)
365                 character.set_position(15,55)
366                 add(character)
367                 add_mouse_click_handler(restarts)
368                 sign.set_position((get_width()/2)+150, (get_height()/2)+150)
369                 warning.set_position((get_width()/2)+140, (get_height()/2)+75)
370                 warning_part_two.set_position((get_width()/2)+120, (get_height()/2)+50)
371                 tries_list.append(1)
372                 for i in range(len(score_list)):
373                     score_list.remove(1)
374             for i in range(6):
375                 if (score_point_list[i][0] == character.get_x() and (score_point_list[i][1] == character.get_y())):
376                     add(sign_two)
377                     add(alert)
378                     add(alert_part_two)
379                     sign_two.set_position((get_width()/2)+150, (get_height()/2)+150)
380                     alert.set_position(90, (get_height()/2)+75)
381                     alert_part_two.set_position((get_width()/2)+120, (get_height()/2)+50)
382                     add_mouse_click_handler(restarts)
383                     score_list.append(1)
384
385     if speed == 5:
386         final_score = (len(score_list))*50
387         add(level_text)
388         add(star_label)
389         add(slash)
390         add(box_label)
391         add(equals)
392     elif speed == 15:
393         final_score = (len(score_list))*100
394         add(level_text_two)
395         add(star_label_two)
396         add(slash_two)
397         add(box_label_two)
398         add(equals_two)
399

```

3.c.ii.

```

def call_function(event):
    if (character.get_x() != 400) and (character.get_y() != 415):
        if speed_input == "2x":
            move_character(event, "Player: " + player, 5)
        elif speed_input == "3x":
            move_character(event, "Player: " + player, 15)
    else:
        results_page()
add_key_down_handler(call_function)

```

3.c.iii.

This selected procedure is the main function that makes the game work, by moving the ball, keeping track of the user's score, restarting the game when they bumped into a wall and letting the user know of such.

3.c.iv.

It moves the red ball depending on which mouse key the user inputted through the use of selection. If the user pushes the right key the ball moves to the right a certain amount, if user pushes the left key it moves to the left, if user enters the up key the ball moves up, and if user pushes the down key it moves down. After each time the ball moves, the procedure uses a for loop and if statements to check if the ball is on a coordinate of the walls, or the score items such as the stars, by accessing the lists that these coordinates are located in and by checking if even one of those coordinates matches the balls current coordinates. If the coordinates of the ball matches a coordinate of the wall, the procedure lets the user know that they bumped into a wall and makes them restart with zero points, however if the ball's coordinates match one of the coordinates of the score items, then it lets the user know that they got some points. It keeps track of these points by appending a number to a list each time the user gets a point. It then multiplies the length of the list by the amount of points of each item, and stores that in a variable which is the user's final score.

3 d.**3.d.i.**

First call:

The two test cases are based on passing a different amount by which the red ball is moved each time the specific mouse keys are clicked, in order to create different speeds for the character. The first call is `move_character(event, "Player: " + player, 5)`.

Second call:

The second call is `move_character(event, "Player: " + player, 15)`.

3 d.ii.

Condition(s) tested by first call:

With the argument of the first call, the if-statement on line 385 which checks if the speed parameter is equal to 5 or if it equals 15, will execute the first part of this selection statement, which consists of lines 386-391.

Condition(s) tested by second call:

With the argument of the second call, the if-statement on line 385 which checks if the speed parameter is equal to 5 or if it equals 15, will execute the second part of this selection statement, which consists of lines 393-398.

3.d.iii.

Results of the first call:

First call results in the points of each the stars and mystery blocks to be 50, and displays this at the top of the screen. It also displays that the difficulty of the game is medium at this level, and with this argument the red ball moves in increments of 5.

Results of the second call:

Second call results in the points of each the stars and mystery blocks to be 100, and displays this at the top of the screen. It also displays that the difficulty of the game is hard at this level, and with this argument the red ball moves in increments of 15.