

27. Specifying types with type hints · 2. Fix the values to match the type hints

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Reset Progress

Learn GDScript From Zero is an open source project by [GDQUEST.COM](https://gdquest.com)

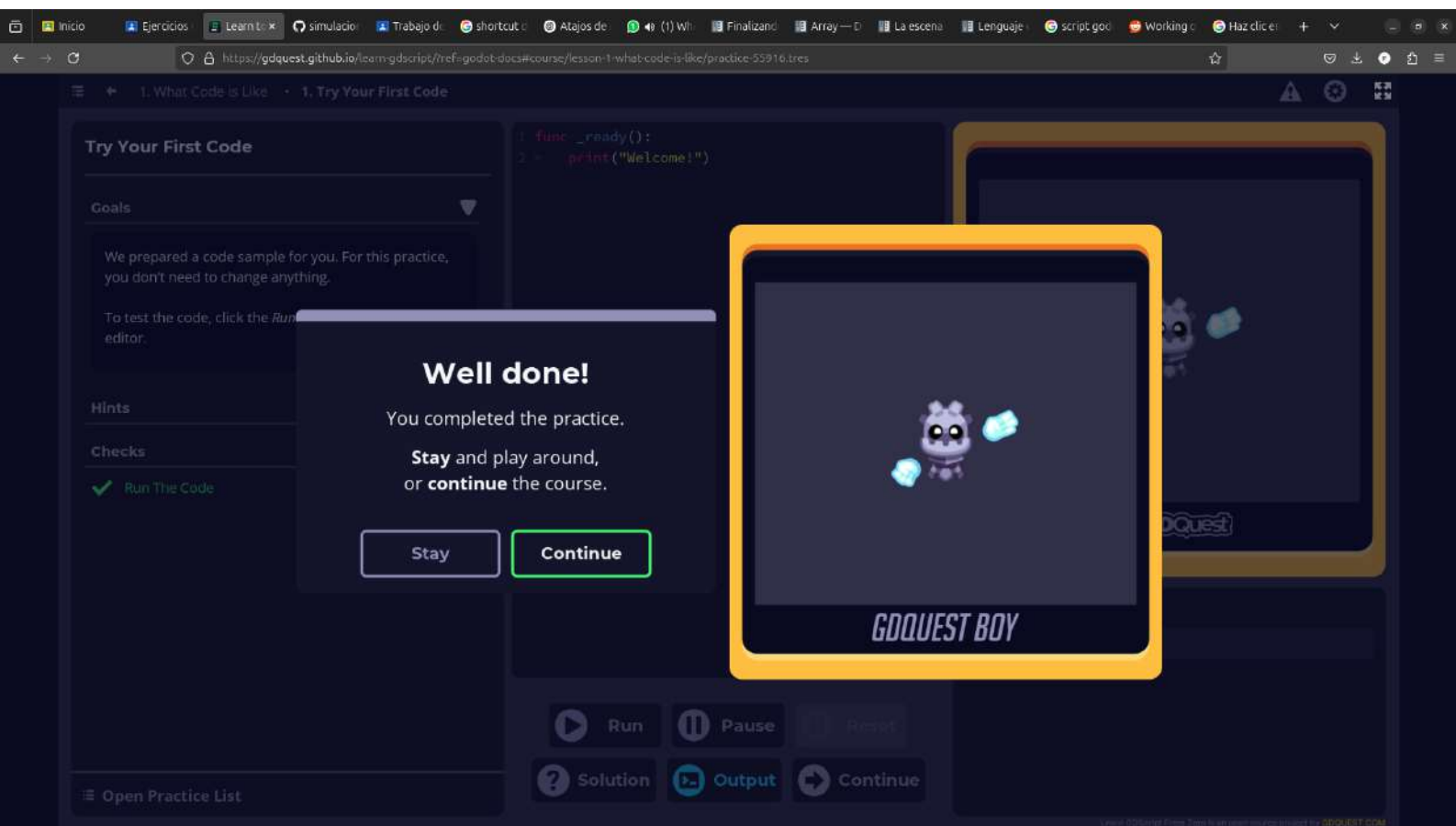
27. Specifying types with type hints · 2. Fix the values to match the type hints

### Course Index - Learn GDScript From Zero

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Reset Progress

Learn GDScript From Zero is an open source project by [GDQUEST.COM](https://gdquest.com)



The screenshot shows the GDQuest IDE interface. On the left, a sidebar titled 'Define A Health Variable' contains sections for 'Goals', 'Hints', and 'Checks'. The 'Goals' section states: 'Define a variable named `health` with a starting value of 100. You can define variables inside or outside functions. In this practice, you shouldn't create a function.' The 'Checks' section shows two green checkmarks: 'Has Health Variable' and 'Health Has Value Of 100'. The main workspace displays a 'Lesson complete!' message with the text: 'But there are still some practices that you've skipped. Stay and revisit the study material, or continue the course.' Below this message are two buttons: 'Stay' and 'Continue'. The bottom bar contains buttons for 'Run', 'Pause', 'Reset', 'Solution', 'Output', and 'Continue'. The 'Output' panel on the right is empty.

A screenshot of the GDQuest website interface. The main content area displays a large, semi-transparent modal window with a dark background. Inside the modal, the text "Well done!" is prominently displayed in a large, white, sans-serif font. Below it, in a smaller white font, is the message "You completed the practice." followed by "Stay and play around, or continue the course." in a slightly larger white font. At the bottom of the modal, there are two buttons: "Stay" and "Continue". The "Continue" button is highlighted with a green border. In the background, the website's sidebar is visible on the left, showing sections like "Goals", "Hints", "Checks", "Documentation", and "Method descriptions". The "Checks" section shows a green checkmark and the text "Character is Visible". The main content area also shows a code editor with a few lines of code: "1 func run():", "2 show()". At the bottom of the screen, there is a navigation bar with buttons for "Run", "Pause", "Reset", "Solution", "Output", and "Continue". The "Output" button is highlighted with a blue border.

InicioEjerciciosLearn to GDScriptsimuladorTrabajo de shortcutAtajos de WhatsAppFinalizandArray — DLa escenaLenguajeScript godWorking oHaz clic e+vx

←→https://gdquest.github.io/learn-gdscript/ref=godot-docs#course/lesson-2-your-first-error/practice/85733.tres

2. Your First Error1. Fix Your First Error

### Fix Your First Error

Goals

This code is incorrect and will cause an error when you try to run it.

The code defines an empty function `this_code_is_wrong`.

To work, the function should use the `return` keyword. But this keyword is commented, which the computer will not see.

Test the current code by pressing the **Run** button.

Then, remove the comment so the code is valid.

Be careful not to remove the `return` keyword. Otherwise, that'll cause another error, that too, if you feel like it.

Hints

Checks

✓ Remove Errors

Open Practice List


```
1 func this_code_is_wrong():
2     # return
```

### Well done!

You completed the practice.

**Stay** and play around, or **continue** the course.

StayContinue



GDQUEST BOY

RunPauseReset

SolutionOutputContinue

[illegible]



21. Functions that return a value · 1. Converting coordinates from the grid to the screen

### Converting Coordinates From The Grid To The Screen

Goals

Define a function that converts a position on a grid to the screen.

The function takes a `Vector2` cell coordinate as an argument. It should return the corresponding `Vector2` screen coordinates at the center of the cell.

Hints

Checks

- ✓ Function Maps Cell To World Coordinates

```
1 var cell_size = Vector2(80, 80)
2
3 func convert_to_world_coordinates(cell):
4     return cell * cell_size + cell_size / 2
```

## Lesson complete!

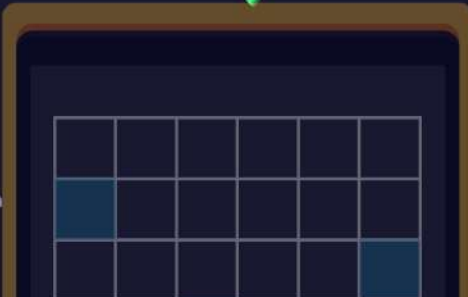
But there are still some practices that you've skipped.

**Stay** and revisit the study material, or **continue** the course.

Run Pause Reset

? Solution **Output** Continue

Output





Preventing Health From Going Below Zero

Goals

- When the robot takes damage, its health can be negative.
- We might want to display the health number on screen, like in Japanese RPGs.
- We don't want negative numbers. We want to stop at zero instead.
- Calling the function should reduce `health` by `amount`.
- If `health` goes below 0, set it to 0 again.

Hints

Checks

- ✓ Health Does Not Go Below Zero
- ✓ Health Reaches Zero
- ✓ Health Takes Different Values

Open Practice List

```
1 func take_damage(amount):
2     health -= amount
3     if health < 0:
4         health = 0
```

Lesson complete!

But there are still some practices that you've skipped.

Stay and revisit the study material, or **continue** the course.

Stay Continue

Run Pause Reset

? Solution ▶ Output ▶ Continue

health = 0

GDQUEST

Output

A screenshot of the GDQuest website interface. The browser's address bar shows the URL: https://gdquest.github.io/learn-gdscript/tref-godot-docs#course/lesson-17-while-loops/practice-lkGx0c7D.tres. The page title is "16. Introduction to While Loops" and the sub-header is "1. Moving to the end of a board". On the left, a sidebar titled "Moving To The End Of A Board" contains "Goals", "Hints", "Checks", and "Documentation". The "Checks" section shows two green checkmarks: "Robot Gets To Bottom Of Board" and "Use While Loop". The main content area displays a code editor with a function `move_to_bottom()` that uses a `while` loop to move a robot to the bottom of a 10x10 grid. A modal window in the center says "Lesson complete!" and "But there are still some practices that you've skipped." It offers "Stay" and "Continue" buttons. The "Continue" button is highlighted with a green border. At the bottom, there are buttons for "Run", "Pause", "Reset", "Solution", "Output", and "Continue". The "Output" button is also highlighted with a green border. The background of the modal and sidebar has a green geometric pattern.

Reseting Size And Position Using Vectors

Goals

The robot's level has increased a lot, and so has its size!

Let's fix this by resetting the robot's *scale* and *position* values.

Create a function named `reset_robot()` that sets the *scale* and *position* of the robot.

The *x* and *y* sub-variables of the robot's *scale* need to be `1.0`.

The robot's *position* needs to be `Vector2(0, 0)`.

As in the previous practice, make sure to use vectors when dealing with scale and position.

Hints

Checks

- ✓ Robot Position Is Reset
- ✓ Robot Scale Is Reset

Open Practice List

```
1 func reset_robot():
2     scale = Vector2(1.0, 1.0)
3     position = Vector2(0.0, 0.0)
```

Lesson complete!

But there are still some practices that you've skipped.

**Stay** and revisit the study material, or **continue** the course.

Stay Continue

Run Pause Reset


? Solution ▶ Output ▶ Continue ▶

GDQuest

The screenshot shows a web browser window displaying the GDQuest GitHub repository. The URL in the address bar is 'https://gdquest.github.io/learn-gdscript/refs/godot-docs#course/lesson-18-for-loops/practice-UDpPwQDw.tres'. The page title is '17: Introduction to For Loops · 2: Improving code with a for loop'. The main content area shows a code editor with the following GDScript code:

```
1 func run():
2     for number in range(3):
3         x = jump(200, 0)
4         x.draw_rectangle(100, 100)
```

Below the code, there is a 'Lesson complete!' message and a 'Continue' button. The left sidebar contains a 'Goals' section with the text: 'Use a for loop to remove the duplicate code in the run() function. In this practice, we revisit the turtle and drawing rectangles. With our new knowledge of for loops, we can condense this code to take up less space and make it easier to modify. The turtle should draw three squares in a horizontal line. The squares should be 100 pixels apart.' The sidebar also has a 'Hints' section, a 'Checks' section with four items (all marked with green checkmarks), and a 'Documentation' section. The bottom of the page has a navigation bar with buttons for 'Run', 'Pause', 'Reset', 'Solution', 'Output', and 'Continue'.



The screenshot shows the GDQuest website interface. At the top, there's a navigation bar with tabs for 'Inicio', 'Ejercicios', 'Learn to', 'simulador', 'Trabajo de', 'shortcuts', 'Atajos de', 'WhatsApp', 'Finalizand', 'Array - D', 'La escena', 'Lenguaje', 'script god', 'Working', and 'Haz clic'. Below this is a browser address bar showing the URL 'https://gdquest.github.io/learn-gdscript/ref-godot-docs#course/lesson-21-strings/practice-NwQMqAYV.tres'. The main content area is titled '20. Strings' and '2. Using an array of strings to play a combo'. On the left, there's a sidebar with 'Goals' and 'Hints' sections. The 'Goals' section contains text about chaining animations and a list of animation names: 'jab' and 'uppercut'. The 'Hints' section is currently empty. The main area displays a large green box with the text 'Lesson complete!' and 'But there are still some practices that you've skipped.' Below this, there are two buttons: 'Stay' and 'Continue'. The 'Continue' button is highlighted with a green border. At the bottom, there's a row of buttons: 'Run', 'Pause', 'Reset', 'Solution', 'Output', and 'Continue'. The 'Output' button is also highlighted with a green border. On the right side, there's a small window showing a robot character and the GDQuest logo.

Using An Array Of Strings To Play A Combo

Goals

In this practice, we'll chain together animations using an array of strings. You might find such combinations in fighting games.

The robot has the following animation names:

- `jab` (makes the robot perform a quick punch)
- `uppercut` (the robot uses a powerful jumping punch)

Populate the `combo` array with animation names as strings.

Then, for each action in the array, call the `play_animation()` function to play them.

The array should contain three values, so the robot makes these three attacks: two jabs followed by one uppercut.

Hints

Checks

Open Practice List

```
1 func run():
2     combo = ["jab", "jab", "uppercut"]
3     for animation_name in combo:
4         play_animation(animation_name)
```

**Lesson complete!**

But there are still some practices that you've skipped.

**Stay** and revisit the study material, or **continue** the course.

Output

GDQUEST



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← → ↺ https://gdquest.github.io/learn-gdscript/ref-godot-docs#course/lesson-27-value-types/practice-jkUdOCQltres

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26. Value types · 2. Letting the player type numbers

Letting The Player Type Numbers

Goals

In our game's shops, we want to let the player type numbers to select the number of items they want to buy or sell.

We need to know the number of items as an `int`, but the computer reads the player's input as a `String`.

Your task is to convert the player's input into numbers for the shop's code to work.

Using the `int()` function, convert the player's input into a whole number and store the result in the `item_count` variable.

Checks

✓ Item Count Is Int

✓ Item Count Matches Player Input

Documentation

Method descriptions

• `int int()`

Returns the argument converted into an `int` (whole number)

Open Practice List

```
1 var player_input = ""
2 var item_count = 0
3
4 func buy_selected_item():
5     player_input = get_player_input()
6     item_count = int(player_input)
```

Lesson complete!


Stay and revisit the study material, or continue the course.

StayContinue

RunPauseReset

SolutionOutputContinue

Select count

 1

CancelOK

GDQUEST

Output



14. Multiplying · 2. Reducing damage at higher levels

### Reducing Damage At Higher Levels

**Goals**

When our robot's level is 3 or more, we want it to take a lot less damage.

Add to the `take_damage()` function so the following happens:

- if the robot's level is greater than 2, reduce the damage amount by 50%

The robot is level 3. An enemy is going to attack for 10 damage. This damage should reduce to 5.

**Hints**

**Checks**

- ✓ Damage Amount Is Correct Value
- ✓ Multiplication Is Used To Reduce Damage Amount

```
1 var level = 3
2 var health = 100
3 var max_health = 100
4
5 func take_damage(amount):
6     if level > 2:
7         amount *= 0.5
8     health -= amount
```


### Lesson complete!

But there are still some practices that you've skipped.

**Stay** and revisit the study material, or **continue** the course.

**Stay** **Continue**

**Output**



GDQuest

Run Pause Reset

? Solution ▶ Output ▶ Continue

Open Practice List

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https://gdquest.github.io/learn-gdscript/ref-godot-docs#course/lesson-26-looping-over-dictionaries/practice-bDQt0Uq.tres

25: Looping over dictionaries · 2: Placing units on the board

### Placing Units On The Board

Goals

We have a dictionary named `units` that maps a cell position on the grid to a unit to put there.

Using a for loop and the `place_unit()` function, place every unit in the `units` dictionary at the desired position on the game board.

Hints

Check

✓ All Items Are Displayed

✓ Code Uses A For Loop

Documentation

Method descriptions

• void `place_unit(cell: Vector2, unit_type: String)`  
Creates a new unit matching the type parameter and places it at the desired cell position on the game grid.

```
1 var units = {  
2     Vector2(1, 0): "robot",  
3     Vector2(2, 2): "turtle",  
4     Vector2(3, 0): "robot",  
5 }  
6  
7 func run():  
8     for cell in units:  
9         var unit_type = units[cell]  
10        place_unit(cell, unit_type)
```


Lesson complete!

Stay and revisit the study material, or continue the course.

StayContinue

RunPauseReset

SolutionOutputContinue



Output

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https://gdquest.github.io/learn-godscript/ref=godot-docs#course/lesson-6-multiple-function-parameters/practice-lkGx0c7D.tres

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6. Your First Function Parameter

4. Drawing rectangles of any size

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Drawing Rectangles Of Any Size

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to include rectangles of varying sizes.

Your job is to code a function named `draw_rectangle()` that takes two parameters: the `length` and the `height` of the rectangle.

The turtle should face towards the right when starting or completing a rectangle.

Note that we could still draw a square with `draw_rectangle()` by having the `length` and `height` equal the same value.

Hints

▶

Checks

▼

✔ Draw Rectangles Of Varying Sizes

Documentation

▼

Method descriptions

• void `move_forward(pixels: int)`  
Moves the turtle in the direction it's facing by some pixels.

• void `turn_right(degrees: int)`  
Rotates the turtle to the right by some degrees.

☰ Open Practice List

```
1 func draw_rectangle(length, height):
2     move_forward(length)
3     turn_right(90)
4     move_forward(height)
5     turn_right(90)
6     move_forward(length)
7     turn_right(90)
8     move_forward(height)
```

Lesson complete!

But there are still some practices that you've skipped.

Stay and revisit the study material, or continue the course.

Stay

Continue

▶ Run

⏸ Pause

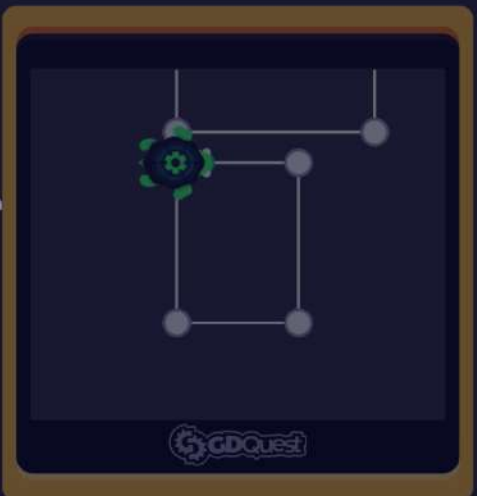
✖ Reset

? Solution

🔍 Output

➡ Continue

Output



GDQuest

GDQuest



A screenshot of a web browser displaying the GDQuest GitHub repository. The page title is "23. Accessing values in arrays" and the sub-header is "2. Realigning the train tracks". The main content area shows a code editor with a JavaScript function `fix_tracks()` that aligns an array of tracks. A modal window titled "Lesson complete!" is overlaid on the page, offering options to "Stay" or "Continue". The modal also includes a "Run" button and a "Solution" button. The background shows a preview of a train track layout and a list of checks that have been completed.



Back To The Drawing Board

Goals

We want to draw many rectangles, something surprisingly common in games.

However, writing this code by hand can get tedious. Instead, you could store the size of your shapes in arrays and use a loop to draw them all in batches.

That's what you'll do in this practice.

Use a `for` loop to draw every rectangle in the `rectangle_sizes` array with the `draw_rectangle()` function.

The rectangles shouldn't overlap or cross each other. To avoid that, you'll need to call the `jump()` function.

Hints

Checks

- ✓ Rectangles Do Not Overlap
- ✓ Rectangles Have The Correct Size

Documentation

Open Practice List

```

1 var rectangle_sizes = [Vector2(200, 120),
2   Vector2(140, 80), Vector2(80, 140),
3   Vector2(200, 140)]
4
5 func run():
6     for size in rectangle_sizes:
7         draw_rectangle(size.x, size.y)
8         jump(size.x, 0)

```

Lesson complete!

But there are still some practices that you've skipped.

**Stay** and revisit the study material, or **continue** the course.

Stay

Continue

Output



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← → ↺ https://gdquest.github.io/learn-gdscript/ref/godot-docs/course/lesson-19-creating-arrays/practice-PxY8VUOp.tres

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18. Creating arrays · 2. Selecting units

Selecting Units

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Goals

In this tactical game, the player and computer can select multiple units at once. You need to call the `select_units()` function and pass it an array of `Vector2` coordinates to know which units to select.

Each `Vector2` in the array represents a cell with a unit.

You can pass arrays in function calls as arguments. As an array is a value type the computer recognizes, you can pass the whole array as a single function argument.

Select all units on the board by passing the correct array to the `select_units()` function.

Hints ▶

Checks ▼  
✓ All Units Are Selected  
✓ Only Units Are Selected

Documentation ▼

Open Practice List

```
func run():
    > select_units([Vector2(1, 0), Vector2(4, 2),
                  Vector2(0, 3), Vector2(5, 1)])
```

Lesson complete!

But there are still some practices that you've skipped.

Stay and revisit the study material, or continue the course.

StayContinue

RunPauseResetSolutionOutputContinue

Output

(0, 0)		(2, 0)	(3, 0)	(4, 0)	(5, 0)
(0, 1)		(2, 1)	(3, 1)	(4, 1)	
(0, 2)		(2, 2)	(3, 2)		(5, 2)
	(1, 3)	(2, 3)	(3, 3)	(4, 3)	(5, 3)

GDQuest