PRESENTATION 14 · LEARNING WITH PYTHON

# Green deposit

Collect three, then bring them home: a built-in counter and a green-LED deposit.

**TheBotCup 2026 · AiBotCup Simulator**



RECAP

# Two things we already know

## Collect

A colour range finds iron, silver or gold. collect() stops and flashes the red LED.

## Variables

A named number, used in any condition (Presentation 7).

Today the robot gives us a variable **for free**.

PART 1

# The mission: Session 14

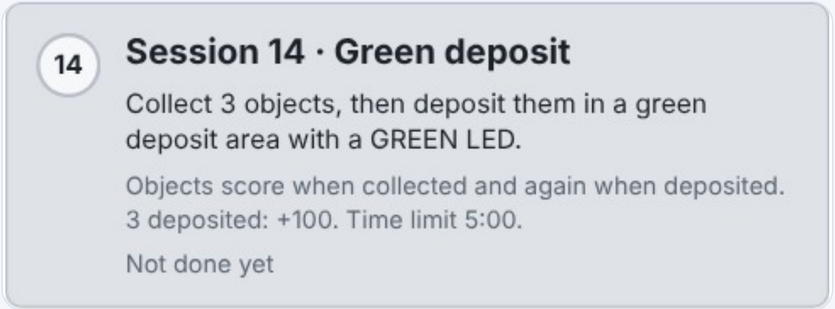
## Collect three, deposit on green

SESSION 14 · GREEN DEPOSIT

# Collect 3, then deposit with a GREEN LED

Objects score when **collected** and again when **deposited**. 3 deposited: **+100**.

Time limit **5:00**. Code challenge: at most **45** lines.






THE FIELD

# Two green corners

**START** at the bottom centre.

Iron, silver and gold all over the field.

Two **green deposit areas** in the top corners: either one works.

PART 2

# Two new ideas

## How full am I? Where do I unload?

IDEA 1 · A BUILT-IN VARIABLE

# LoadedObjects counts for us

**0 → 3**

+1 each time an object is **really on board**

**→ 0**

back to 0 after a **deposit**

No need to create it. Just use it in a condition: **LoadedObjects < 3** or **LoadedObjects == 3** (two equals signs).

IDEA 2 · THE DEPOSIT

# Both sensors on green, then Deposit

### Green range

R 0–75 · G 130–200 · B 40–110, on **left and right**.

### deposit()

Stops, **LED_1 = 1** (steady) in **green**, 3.2 s: the robot unloads.

Both sensors on green means the robot is fully inside the area.

PART 3

# Step by step in Python

## Nine branches, Deposit on top

STEP 1 · THE WHOLE PROGRAM

# Deposit, six collects, two drivers

| Branch | Condition | Also | Action |
|---|---|---|---|
| **1 Deposit** | onGreen() | LoadedObjects == 3 | deposit() |
| **2 IronLeft** | left iron | LoadedObjects < 3 | collect() |
| **3 IronRight** | right iron | LoadedObjects < 3 | collect() |
| **4 SilverLeft** | left silver | LoadedObjects < 3 | collect() |
| **5 SilverRight** | right silver | LoadedObjects < 3 | collect() |
| **6 GoldLeft** | left gold | LoadedObjects < 3 | collect() |
| **7 GoldRight** | right gold | LoadedObjects < 3 | collect() |
| **8 Ahead** | US_Front ≤ 20 | — | −2 / 2 · Duration 700 |
| **9 Forward** | the else | — | 4.5 / 4.5 |

STEP 2 · LINES 3–8

# Is this green? Are both sensors on green?

```
3  def iron(r, g, b): return r <= 60 and g <= 60 and b <= 60
4  def silver(r, g, b): return 90 <= r <= 135 and 92 <= g <= 137 and 98 <= b <= 142
5  def gold(r, g, b): return r >= 195 and 135 <= g <= 200 and b <= 80
6  def green(r, g, b): return r <= 75 and 130 <= g <= 200 and 40 <= b <= 110
7  def onGreen():
8      return green(CSLeft_R, CSLeft_G, CSLeft_B) and green(CSRight_R, CSRight_G, CSRight_B)
```

**green(r, g, b)**: R ≤ 75, G 130–200, B 40–110.

**onGreen()** calls green() for the left and the right sensor.

STEP 3 · LINES 10–18

# Two actions: collect() and deposit()

```
10  def collect():
11      WheelLeft = 0; WheelRight = 0
12      LED_1 = 2; LED_R = 255; LED_G = 0; LED_B = 0      # flashing red
13      Duration = 3200                                   # hold 3.2 seconds
14
15  def deposit():
16      WheelLeft = 0; WheelRight = 0
17      LED_1 = 1; LED_R = 0; LED_G = 255; LED_B = 0      # steady green
18      Duration = 3200                                   # hold 3.2 seconds
```

**collect()**: LED_1 = 2, flashing **red**.

**deposit()**: LED_1 = 1, **steady green** (0, 255, 0).

Both stop the wheels and hold for **3200** ms.

STEP 4 · LINES 20–23

# Deposit comes first

```
20  def game1():
21      LED_1 = 0
22      if LoadedObjects == 3 and onGreen():                    # Deposit
23          deposit()
```

**LoadedObjects == 3**: two equals signs ask “is it equal?”.

and **onGreen()** → deposit(). First in the chain, so it always wins.

STEP 5 · LINES 24–35

# Collect only while not full

```
24      elif LoadedObjects < 3 and iron(CSLeft_R, CSLeft_G, CSLeft_B):     # IronLeft
25          collect()
26      elif LoadedObjects < 3 and iron(CSRight_R, CSRight_G, CSRight_B):  # IronRight
27          collect()
28      elif LoadedObjects < 3 and silver(CSLeft_R, CSLeft_G, CSLeft_B):   # SilverLeft
29          collect()
30      elif LoadedObjects < 3 and silver(CSRight_R, CSRight_G, CSRight_B):  # SilverRight
31          collect()
32      elif LoadedObjects < 3 and gold(CSLeft_R, CSLeft_G, CSLeft_B):     # GoldLeft
33          collect()
34      elif LoadedObjects < 3 and gold(CSRight_R, CSRight_G, CSRight_B):  # GoldRight
35          collect()
```

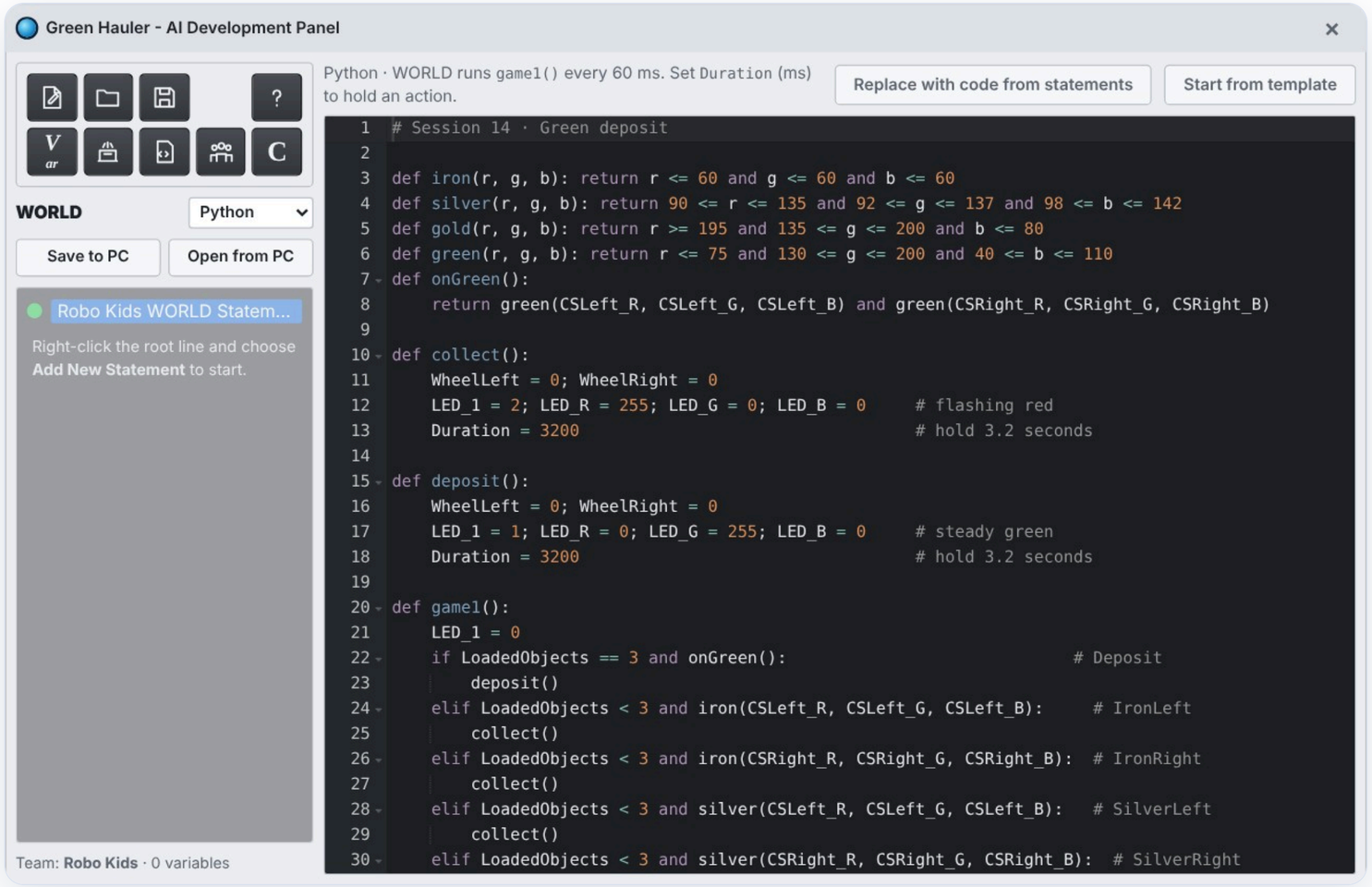
Every collect starts with **LoadedObjects < 3 and**.

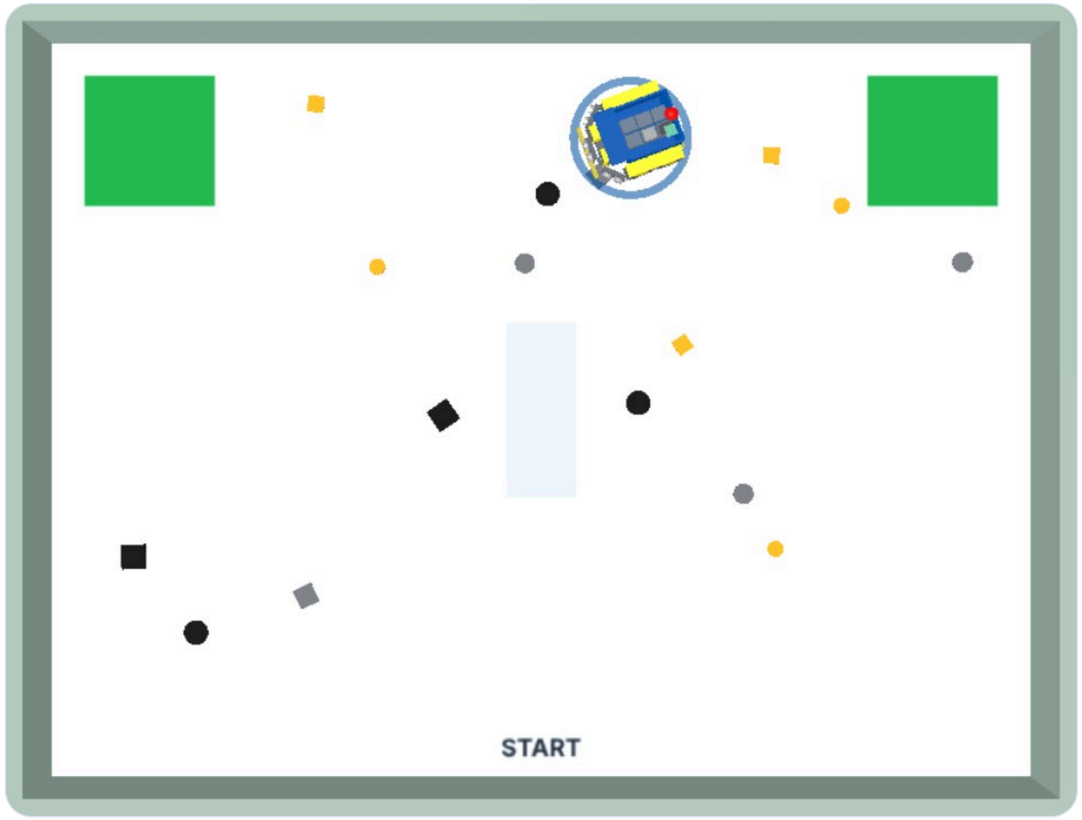
Then **Ahead** and the else **Forward** as before (lines 36–40).

STEP 6 · BUILD AND LOAD

# The whole program, built

1. WORLD menu: **Python**.
2. Type the program, name it **Green Hauler**.
3. Press **Build**, then **OK**.
4. Press **Load** on the BLUE side.






**Colour Sensors**

| | | |
|---|---|---|
| Left R | 108 | (CSLeft_R) |
| G | 114 | (CSLeft_G) |
| B | 116 | (CSLeft_B) |

left sees this colour

| | | |
|---|---|---|
| Right R | 227 | (CSRight_R) |
| G | 232 | (CSRight_G) |
| B | 240 | (CSRight_B) |

right sees this colour

**Robot**

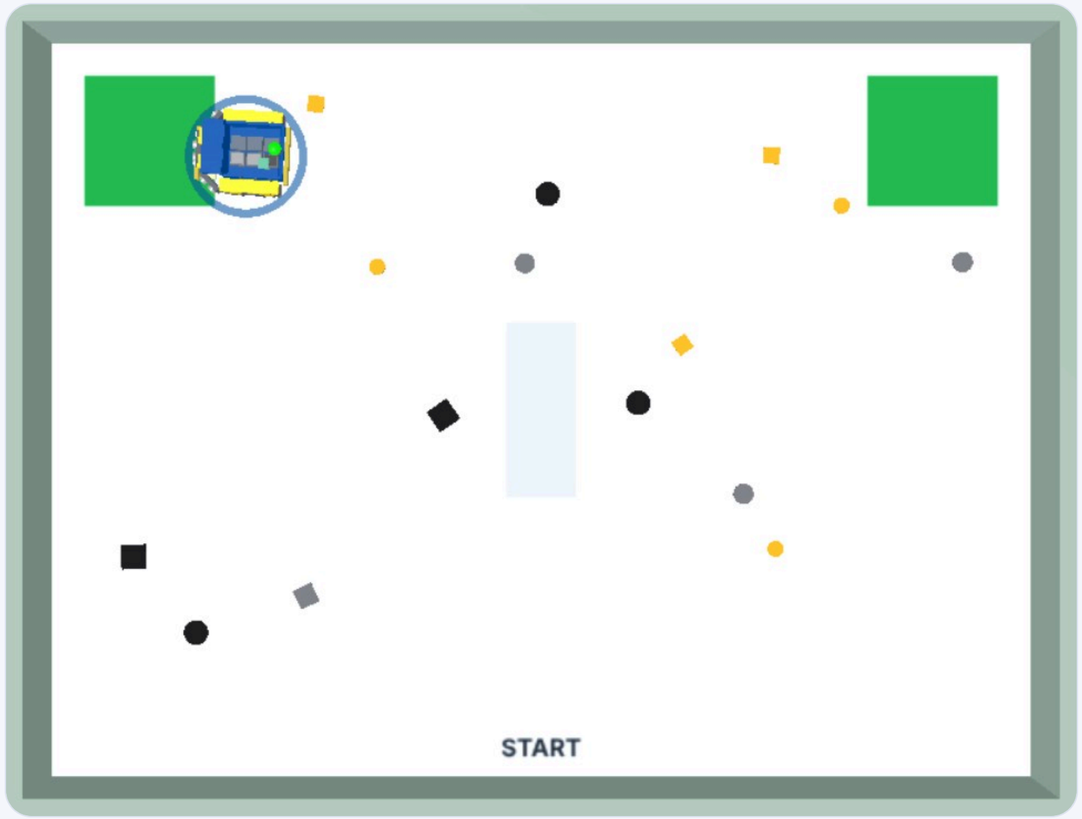
| | |
|---|---|
| Wheels | L **0.0** · R **0.0** · LED **2** |
| Load | **2**/6 · Fe 1 Ag 1 Au 0 |
| On | **collecting 2.1 / 3 s** |

STEP 7 · RUN · 32.6 S

# The third object

Load **2** < 3, left sees silver (111, 113, 116): **SilverLeft**.

After this one, LoadedObjects is **3**: no more collects.




**Colour Sensors**

| | | |
|---|---|---|
| Left R | 28 | (CSLeft_R) |
| G | 160 | (CSLeft_G) |
| B | 69 | (CSLeft_B) |

left sees this colour

| | | |
|---|---|---|
| Right R | 30 | (CSRight_R) |
| G | 158 | (CSRight_G) |
| B | 72 | (CSRight_B) |

right sees this colour

**Robot**

Wheels L **0.0** · R **0.0** · LED **1**

Load **3**/6 · Fe 1 Ag 2 Au 0

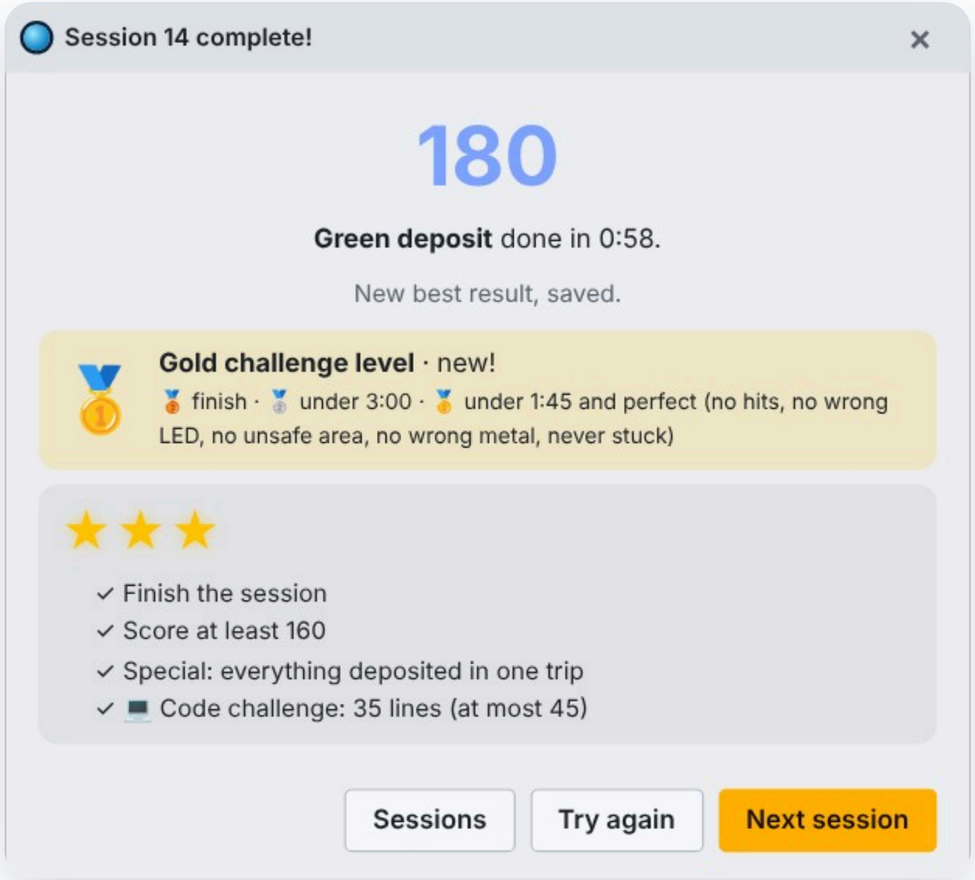
On **deposit area · depositing 2.0 / 3 s**

**STEP 8 · RUN · 55.3 S**

# Home on green

Both sensors green, load **3**: **Deposit**, green LED.

Full robot drives over metals until it finds green.



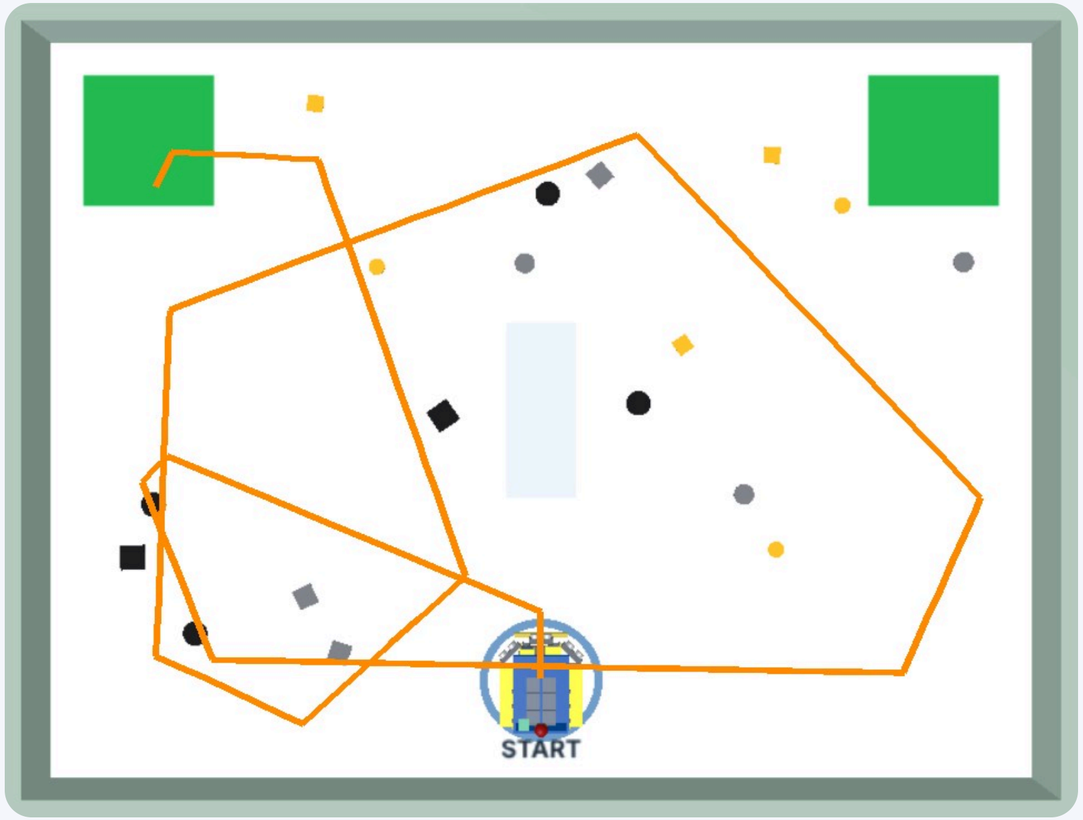

RESULT · TESTED

# 180 points in 0:58 · Gold

**Score** · collected 40 + deposited 40 + bonus 100.

**Special star** · everything deposited in one trip.

**Code challenge** · at most 45 lines. We used 35.




THE PATH · RECORDED

# Collect, then search for green

The path ends in the **top-left** green corner.

One number, **LoadedObjects**, switches the robot from collecting to going home.

DID NOT WORK?

# Check first, then tune carefully

| What you see | What to do |
| --- | --- |
| Keeps collecting after 3 | Add **LoadedObjects < 3 and** to every collect |
| Drives over green when full | Use **==** (two signs) and check the green range |
| Deposits at the edge, nothing happens | onGreen() checks **both** sensors, not just one |
| Old program still on the robot | **Build** again, then **Load** on BLUE |

NEXT TIME

# Presentation 15 · One of each

Exactly one iron, one silver and one gold, with **LoadedIron, LoadedSilver, LoadedGold**.