PRESENTATION 9 · LEARNING WITH STATEMENTS

Collect and deposit

Fill the robot with six objects, then empty it in a green deposit area for double points.

TheBotCup 2026 · AiBotCup Simulator



RECAP · PRESENTATION 8

The simulator counts what is on board

LoadedObjects

How many objects the robot carries: 0 to 6. **Today's star.**

LoadedIron · Silver · Gold

How many of each metal. Used in Presentation 8.

They go up only when an object is really on board, and **down to 0** when the robot deposits.

PART 1

The mission: Session 9

Collect six, then deposit six

SESSION 9 · COLLECT AND DEPOSIT

Any metal, six of them, then unload

What happens	Points
Collect an object	its value
Deposit it	its value again
6 deposited	+150

Time limit **7:00**. Bonus star: deposit everything in **one trip**.





THE FIELD

Two green deposit areas

One in the **top-left** corner, one in the **top-right**. Either one works.

6 iron, 6 silver and 6 gold: **any six** will do.

Block in the middle, START at the bottom, as before.

HOW TO DEPOSIT

Collect’s twin: Key Action Deposit

Both sensors

Left **and** right colour sensors must be on the green.

Deposit (green LED)

Wheels stop, LED **steady green** (not flashing) for 3 s.

Unloaded

Every object scores again. LoadedObjects goes back to **0**.

Collect: **red, flashing** · Deposit: **green, steady**. The Key Action sets this for you.

COLOUR SENSORS · GREEN

What does green look like in numbers?

	R	G	B
Deposit area	30	160	70
Our test, left sensor	31	159	67
Range we use	0 – 75	130 – 200	40 – 110

Low red, high green, low blue. No metal and not the floor fits all three ranges. The range comes from the simulator’s own tip.

PART 2

The plan

Two jobs, one switch

THE PLAN

First fill up, then empty out

JOB 1 · while LoadedObjects < 6

Collect any metal

Bounce round the field like Presentation 6.

JOB 2 · when LoadedObjects == 6

Deposit on green

Keep bouncing until both sensors see green.

One built-in number switches the robot from job 1 to job 2. No variables to make.

COMPARING NUMBERS

< 6 and == 6

`LoadedObjects < 6`

“less than 6”: true for 0, 1, 2, 3, 4, 5. On every **collect** statement.

`LoadedObjects == 6`

“is equal to 6”: true only when full. On the **deposit** statement.

== (two signs) **tests** if equal. **=** (one sign) **changes** a variable, like Iron = Iron + 1.

PART 3

Step by step in statements

Nine statements

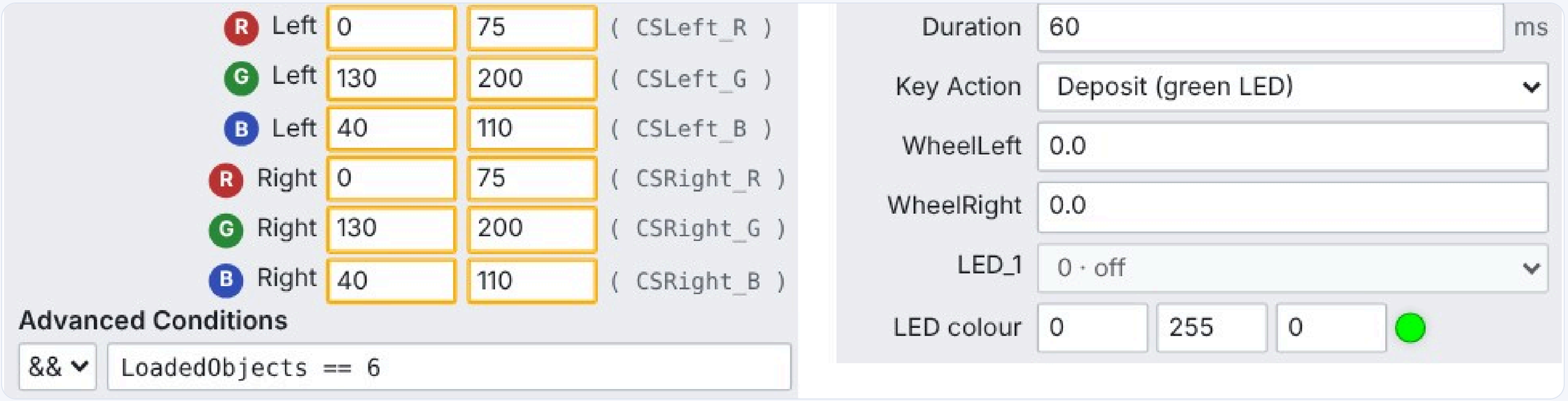
STEP 1 · THE WHOLE PROGRAM

Deposit on top, then collect, then move

Statement	Ranges	Advanced Condition	Action
1 Deposit	both sensors green	LoadedObjects == 6	Deposit
2 IronLeft	CSLeft iron	LoadedObjects < 6	Collect
3 IronRight	CSRight iron	LoadedObjects < 6	Collect
4 SilverLeft	CSLeft silver	LoadedObjects < 6	Collect
5 SilverRight	CSRight silver	LoadedObjects < 6	Collect
6 GoldLeft	CSLeft gold	LoadedObjects < 6	Collect
7 GoldRight	CSRight gold	LoadedObjects < 6	Collect
8 Ahead	US_Front 0–20	—	−2 / 2, 700 ms
9 Forward	none	—	4.5 / 4.5

STEP 2 · STATEMENT 1 · DEPOSIT

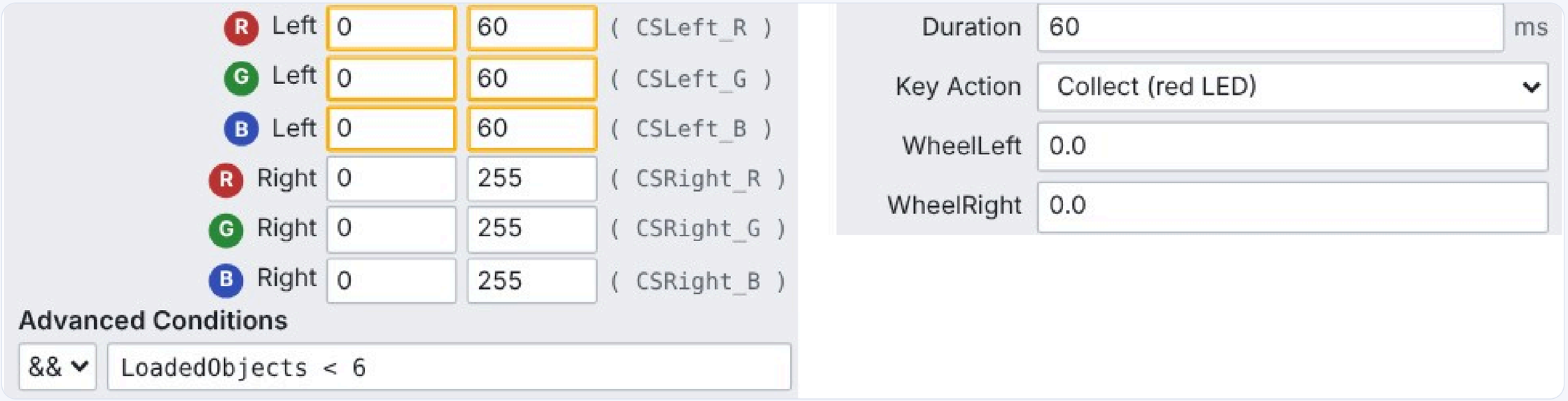
Six green ranges and one condition



Key Action **Deposit (green LED)** sets the wheels to 0 and the LED colour to 0, 255, 0 for you.

STEP 3 · STATEMENTS 2 TO 7 · COLLECT

Any metal, while there is room



All six collect statements use **LoadedObjects < 6**. Ranges as in Presentation 7: iron, silver, gold, left and right.

STEP 4 · STATEMENTS 8 AND 9

Ahead and Forward keep it moving

8 Ahead
US_Front 0–20

Front	0	20	(US_Front)
Left	0	255	(US_Left)
Right	0	255	(US_Right)

Duration	700	ms
Key Action	None	
WheelLeft	-2.0	
WheelRight	2.0	

9 Forward
no conditions

Front	0	255	(US_Front)
Left	0	255	(US_Left)
Right	0	255	(US_Right)

Duration	60	ms
Key Action	None	
WheelLeft	4.5	
WheelRight	4.5	

Full or not, the robot keeps bouncing. When full, it is simply **looking for green** instead of metal.

WHY THIS ORDER?

Each job only wakes up at the right time

Robot carries	On green	On metal
0 – 5 objects	drives over it	**Collect**
6 objects	**Deposit**	drives over it

Deposit and collect can never match at the same time, so their order does not fight. Forward is still last.



STEP 5 · RUN · JOB 1

The sixth object at 57 s

Robot

Wheels L **0.0** · R **0.0** · LED **2**

Load **5**/6 · Fe 3 Ag 2 Au 0

On **collecting 1.9 / 3 s**

Load **5/6**, collecting the last one. When it ends: **6/6**, job 2 starts.

Our run: iron, silver, silver, iron, iron, iron.



STEP 6 · RUN · JOB 2

Green on both sides at 65 s

Colour Sensors

Left R	31	(CSLeft_R)
G	159	(CSLeft_G)
B	67	(CSLeft_B)

left sees this colour

Right R	33	(CSRight_R)
G	159	(CSRight_G)
B	67	(CSRight_B)

right sees this colour

Position

X	48	(PositionX)
Y	152	(PositionY)

Compass

87 (Compass)

Time

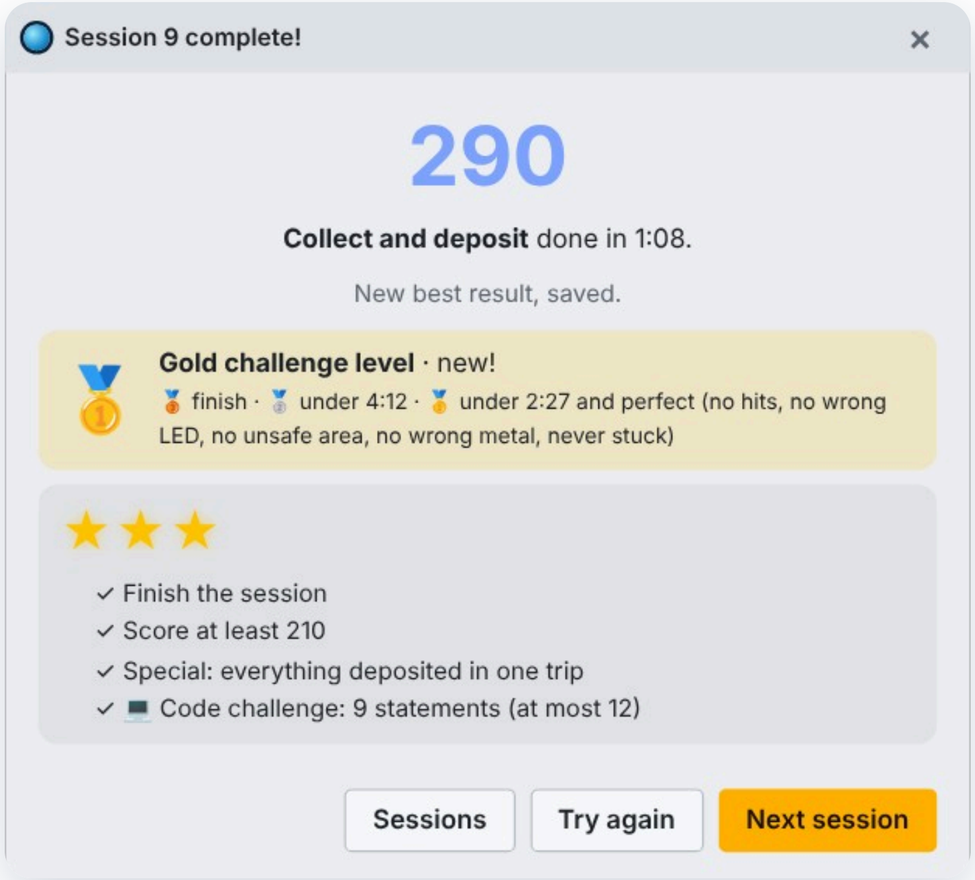
64 (Time)

Robot

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

Load **6**/6 · Fe 4 Ag 2 Au 0

On **deposit area · depositing 1.8 / 3 s**



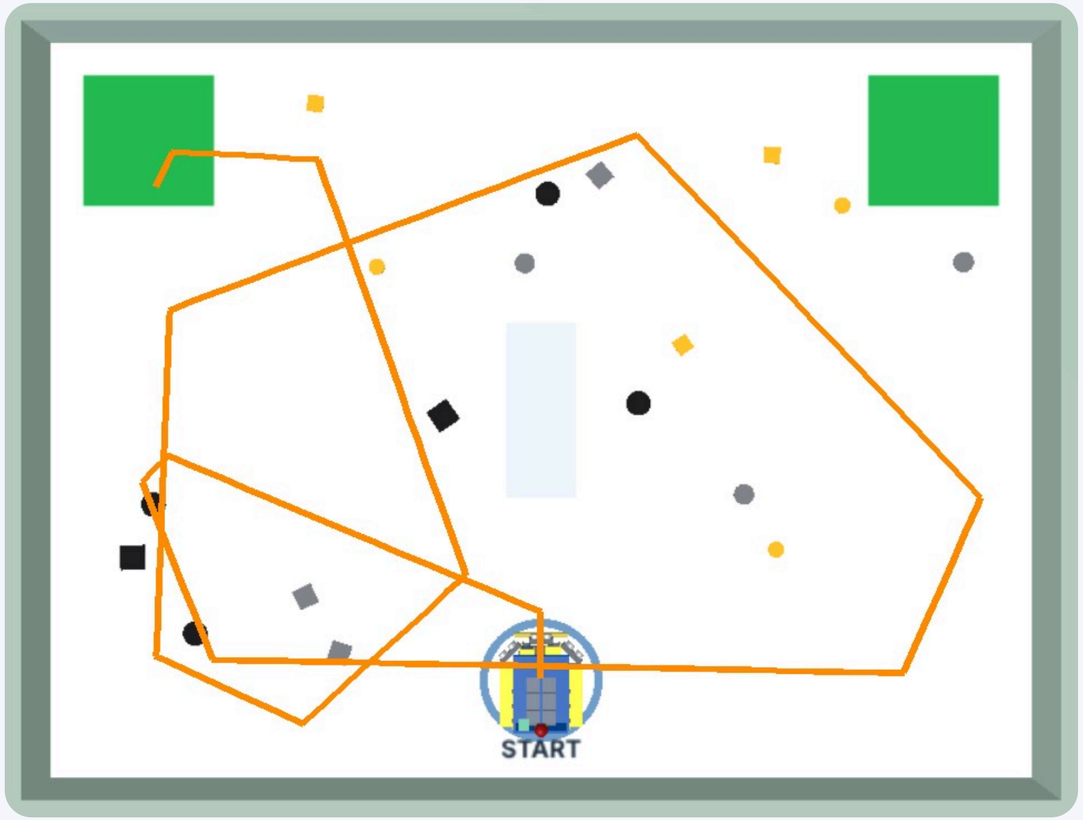
RESULT · TESTED

290 points in 1:08 · Gold

Score · collected 4×10 + 2×15 = 70, deposited 70 again, +150 = **290**.

Medals · Silver: under 4:12 · Gold: under 2:27 and perfect.

Stars · deposited in one trip · 9 of at most 12 statements.



THE PATH · RECORDED

Bounce until full, bounce until green

Full at **58 s**, on green at **63 s**, done at **1:08**.

Finding green by bouncing took **luck** as well as code.

Challenge: steer straight to a corner when full.

DID NOT WORK?

Check first, then tune carefully

What you see	What to do
Drives over green when full	Green ranges on **both** sensors; condition **LoadedObjects == 6**
Stops on green but nothing happens	Key Action must be **Deposit (green LED)**, not Collect
Deposits with fewer than 6	Condition says **< 6** or is missing: use **== 6**
Tries to collect a 7th object	Collect statements need **LoadedObjects < 6**
Old program still on the robot	**Build** again, then **Load** on BLUE

NEXT TIME

Presentation 10 · Avoid the traps

Red traps with a light-red **warning band**: see it, back off, go round.