LEGO® Education SPIKE™ Prime

Programy w języku Python
Możliwe rozwiązania

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Na pomoc!

https://education.lego.com/pl-pl/lessons/prime-invention-squad/help

```
from spike import PrimeHub, App, ColorSensor
from spike.control import wait_for_seconds

hub = PrimeHub()
app = App()
color_sensor = ColorSensor('B')

# Oto historia nr 1: Kiki idzie na spacer. Jest na dworze, jest radosna, aż do momentu, w którym...
hub.left_button.wait_until_pressed()

color_sensor.wait_until_color('blue')
app.play_sound('Traffic')

color_sensor.wait_until_color('yellow')
app.play_sound('Ring Tone')

color_sensor.wait_until_color('green')
app.play_sound('Dog Bark 1')
app.play_sound('Dog Bark 1')

# Oto historia nr 2.
hub.right_button.wait_until_pressed()

color_sensor.wait_until_color('blue')
app.play_sound('Door Knock')

color_sensor.wait_until_color('yellow')
app.play_sound('Glass Breaking')

color_sensor.wait_until_color('green')
app.play_sound('Dog Bark 3')
```

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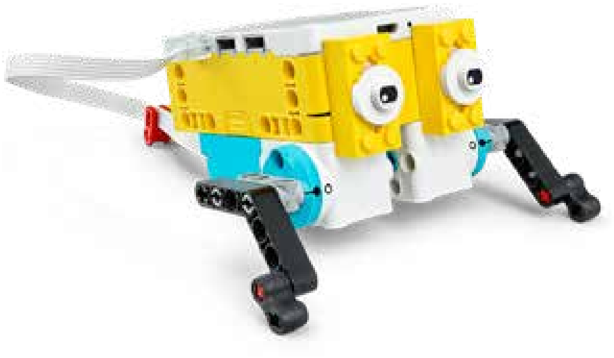
Wyścig skoczków

https://education.lego.com/pl-pl/lessons/prime-invention-squad/hopper-race



```
from spike import PrimeHub, MotorPair
from spike.control import wait_for_seconds


hub = PrimeHub()
hop_motors = MotorPair('E', 'F')


hop_motors.set_default_speed(50)


hub.light_matrix.write('3')
wait_for_seconds(1)

hub.light_matrix.write('2')
wait_for_seconds(1)

hub.light_matrix.write('1')
wait_for_seconds(1)

# Dostosuj to ustawienie, aby zmienić odległość, na jaką będzie się przesuwał Twój skoczek.
# ---------------v
hop_motors.move(10, 'seconds')
```

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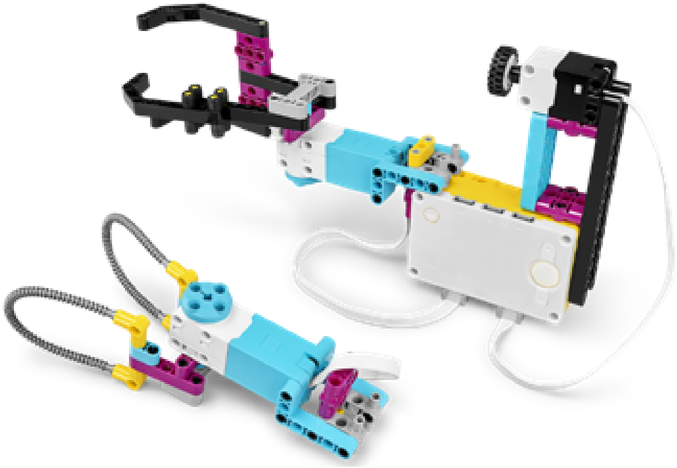
Supersprzątacz

https://education.lego.com/pl-pl/lessons/prime-invention-squad/super-cleanup



```
from spike import ForceSensor, Motor


force_sensor = ForceSensor('E')
grabber_motor = Motor('A')


while True:
    force_sensor.wait_until_pressed()
    grabber_motor.set_stall_detection(False)
    grabber_motor.start(-75)

    force_sensor.wait_until_released()
    grabber_motor.set_stall_detection(True)
    grabber_motor.start(75)
```

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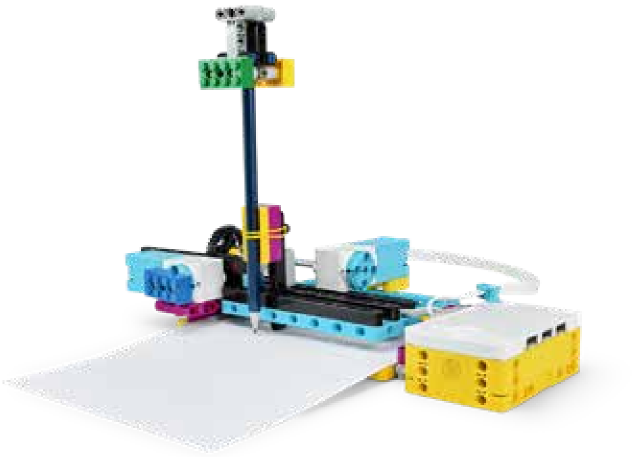
Awaria

https://education.lego.com/pl-pl/lessons/prime-invention-squad/broken



```
from spike import PrimeHub, Motor
from spike.control import wait_for_seconds
hub = PrimeHub()
x_motor = Motor('A')
y_motor = Motor('C')

hub.left_button.wait_until_pressed()
x_motor.set_default_speed(-100)
x_motor.run_for_seconds(1.5)
wait_for_seconds(1)

# Te 4 linie powinny „wyciąć” kwadrat.
x_motor.set_default_speed(100)
y_motor.set_default_speed(100)
x_motor.run_for_degrees(400)
y_motor.run_for_degrees(575)
x_motor.run_for_degrees(-400)
y_motor.run_for_degrees(-575)

hub.right_button.wait_until_pressed()
x_motor.set_default_speed(100)
x_motor.run_for_seconds(1.5)

wait_for_seconds(1)
# Te 4 lines powinny „wyciąć” prostokąt.
x_motor.run_for_degrees(-60)
x_motor.run_for_degrees(-400)
y_motor.run_for_degrees(-800)
x_motor.run_for_degrees(400)
y_motor.run_for_degrees(800)
```

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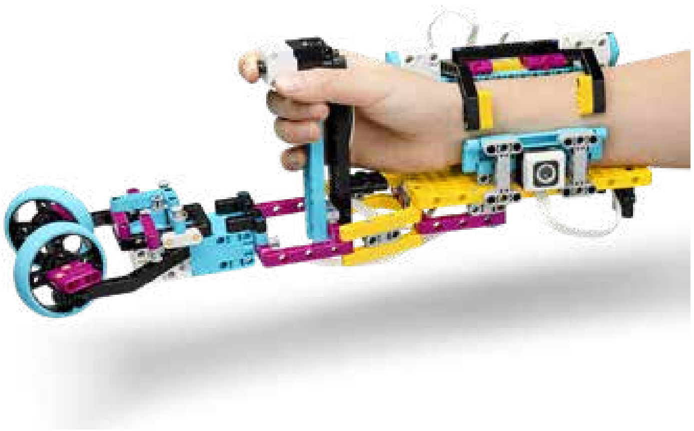
Projekt na zlecenie

https://education.lego.com/pl-pl/lessons/prime-invention-squad/design-for-someone



```
from spike import PrimeHub, Motor, ForceSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
motor_a = Motor('A')
motor_e = Motor('E')
force_sensor = ForceSensor('B')


motor_a.set_default_speed(100)
motor_e.set_default_speed(-100)
motor_a.set_stall_detection(False)
motor_e.set_stall_detection(False)
motor_a.set_stop_action('hold')
motor_e.set_stop_action('hold')


motor_a.run_to_position(0)
hub.speaker.beep(60)
hub.speaker.beep(72)

# żeby proteza zaczepiła się o rękę
motor_a.run_for_seconds(1)
motor_e.run_for_seconds(1)

while True:
    if hub.right_button.was_pressed():
        # żeby proteza puściła rękę
        motor_a.run_to_position(0)
        motor_e.run_to_position(0)
        break

    if force_sensor.get_force_newton() > 5:
        hub.light_matrix.show_image('SQUARE')
    else:
        hub.light_matrix.off()

    wait_for_seconds(0.01)
```

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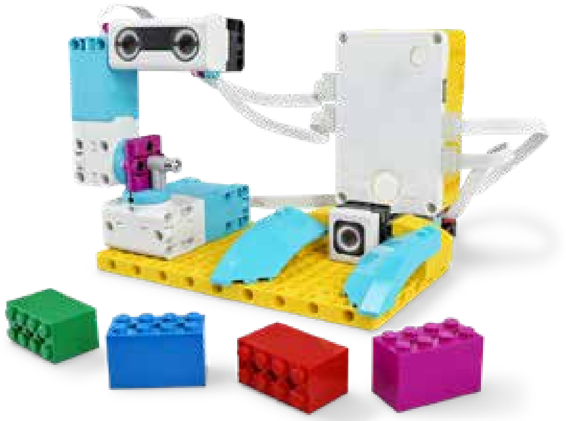
Złóż zamówienie

https://education.lego.com/pl-pl/lessons/prime-kickstart-a-business/place-your-order



```
from spike import PrimeHub, App, ColorSensor, DistanceSensor, Motor
from spike.control import wait_for_seconds


hub = PrimeHub()
app = App()
distance_sensor = DistanceSensor('C')
color_sensor = ColorSensor('D')
arm_motor = Motor('A')
base_motor = Motor('F')


arm_motor.set_default_speed(50)
base_motor.set_default_speed(50)


arm_motor.run_to_position(350)
base_motor.run_to_position(350)

app.start_sound('Connect')
distance_sensor.light_up_all()

for x in range(10):
    hub.light_matrix.show_image('HEART')
    wait_for_seconds(0.5)
    hub.light_matrix.show_image('HEART_SMALL')
    wait_for_seconds(0.5)

hub.light_matrix.show_image('HEART')

while True:
    color_sensor.wait_until_color('violet')
    arm_motor.run_for_degrees(30)
    arm_motor.run_for_degrees(-60)
    arm_motor.run_for_degrees(60)
    arm_motor.run_for_degrees(-30)
    app.start_sound('Connect')
    hub.light_matrix.show_image('HEART')
```

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Napraw usterkę

https://education.lego.com/pl-pl/lessons/prime-kickstart-a-business/out-of-order

```
from spike import PrimeHub, DistanceSensor, Motor, MotorPair
from spike.control import wait_for_seconds

hub = PrimeHub()
distance_sensor = DistanceSensor('B')
drive_motors = MotorPair('A', 'E')
small_wheel_motor = Motor('C')


small_wheel_motor.set_default_speed(100)
drive_motors.set_default_speed(50)

hub.left_button.wait_until_pressed()
# Oto jeden ze sposobów debugowania pierwszego programu.
small_wheel_motor.run_to_position(0)
drive_motors.start()
# Dostosuj wartość w tym miejscu -------------v
distance_sensor.wait_for_distance_closer_than(15, DistanceSensor.CM)
drive_motors.stop()



hub.right_button.wait_until_pressed()
# Oto jeden ze sposobów debugowania drugiego programu.
small_wheel_motor.run_to_position(0)
drive_motors.start()
# Dostosuj wartość w tym miejscu -------------v
distance_sensor.wait_for_distance_closer_than(15, DistanceSensor.CM)
drive_motors.stop()
# Dostosuj wartość w tym miejscu ----------v
small_wheel_motor.run_to_position(20)
wait_for_seconds(1)
drive_motors.move(-50, DistanceSensor.CM)
drive_motors.stop()
small_wheel_motor.run_to_position(0)
wait_for_seconds(1)
# Dostosuj wartość w tym miejscu
# ----------------v
drive_motors.move(50, DistanceSensor.CM)
drive_motors.stop()
```

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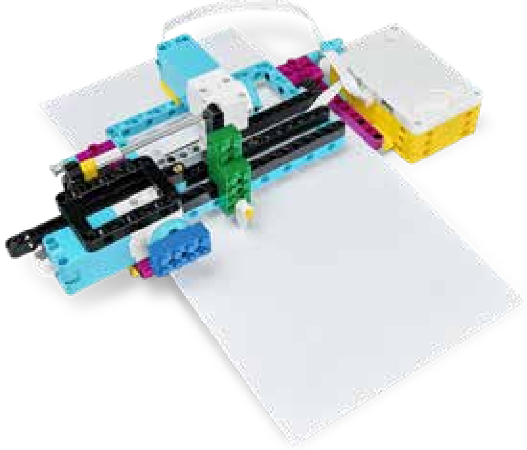
Śledź swoje paczki

https://education.lego.com/pl-pl/lessons/prime-kickstart-a-business/track-your-packages



```
from spike import PrimeHub, Motor
from spike.control import wait_for_seconds

hub = PrimeHub()
horizontal_motor = Motor('A')
vertical_motor = Motor('C')

horizontal_motor.set_default_speed(75)
vertical_motor.set_default_speed(75)


# Ten program będzie śledzić Twoją przesyłkę na mapie nr 1.

hub.left_button.wait_until_pressed()
horizontal_motor.run_for_seconds(1)
wait_for_seconds(1)

vertical_motor.run_for_degrees(475)
horizontal_motor.run_for_degrees(-545)
vertical_motor.run_for_degrees(950)
horizontal_motor.run_for_degrees(550)
vertical_motor.run_for_degrees(380)

# Uruchamia oba silniki jednocześnie, by uzyskać ruch po skosie.
vertical_motor.start(speed=75)
horizontal_motor.run_for_degrees(-540, speed=50)
vertical_motor.stop()

vertical_motor.run_for_degrees(175)
```

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Pilnie strzeżone

https://education.lego.com/pl-pl/lessons/prime-kickstart-a-business/keep-it-safe

```
from spike import PrimeHub, Motor, LightMatrix
from spike.control import wait_for_seconds, wait_until
from spike.operator import greater_than

hub = PrimeHub()
lock_motor = Motor('C')
dial_motor = Motor('B')
lock_motor.set_default_speed(50)

hub.speaker.beep(60)
hub.speaker.beep(72)

# Zamyka drzwi.
dial_motor.set_stop_action('coast')
dial_motor.run_to_position(0)
dial_motor.set_degrees_counted(0)
hub.light_matrix.show_image('NO')

# Odblokowuje drzwi, kiedy na Hubie jest wciśnięty lewy przycisk.

hub.left_button.wait_until_pressed()
hub.speaker.beep(72)
wait_until(dial_motor.get_degrees_counted, greater_than, 180)
hub.speaker.beep(60)
lock_motor.run_for_seconds(1)
hub.light_matrix.show_image('NO')
wait_for_seconds(2)
hub.light_matrix.show_image('YES')
wait_for_seconds(5)
```

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Jeszcze pilniej strzeżone

https://education.lego.com/pl-pl/lessons/prime-kickstart-a-business/keep-it-really-safe

```
from spike import PrimeHub, App, Motor
from spike.control import Timer, wait_for_seconds

hub = PrimeHub()
app = App()
dial = Motor('B')
lock = Motor('C')
dial_cover = Motor('E')
timer = Timer()

dial.set_default_speed(75)
lock.set_default_speed(75)
dial_cover.set_default_speed(75)

def unlock():

while not hub.left_button.is_pressed() and dial.get_degrees_counted() < 180:
    hub.speaker.beep(60)
    dial_cover.run_for_degrees(15)
    wait_for_seconds(0.8)

    if timer.now() > 5:
        app.play_sound('Bonk')
        return

    hub.light_matrix.show_image('NO')
    wait_for_seconds(2)
    hub.light_matrix.show_image('YES')
    dial_cover.run_to_position(0)
    lock.run_for_seconds(1)
    app.play_sound('Wand')
    wait_for_seconds(5)

# Blokuje drzwi i uruchamia mechanizm dodatkowej ochrony.

hub.speaker.beep(60)
hub.speaker.beep(72)
lock.run_for_seconds(-1)
dial.run_to_position(0)
dial_cover.run_to_position(0)
dial.set_degrees_counted(0)
dial.set_stop_action('coast')
hub.light_matrix.show_image('NO')
timer.reset()
unlock()
```

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Zautomatyzuj to!

https://education.lego.com/pl-pl/lessons/prime-kickstart-a-business/automate-it

```
from spike import App, Motor, ColorSensor
from spike.control import wait_for_seconds

app = App()
base_motor = Motor('A')
arm_motor = Motor('F')
color_sensor = ColorSensor('D')

base_motor.set_default_speed(25)
arm_motor.set_default_speed(25)

def check_color():
    # Sprawdza kolor przesyłki.
    arm_motor.run_to_position(235)
    wait_for_seconds(4)
    if color_sensor.get_color() == 'violet':
        base_motor.run_to_position(0)
        arm_motor.run_to_position(25)
        app.play_sound('Triumph')
        arm_motor.run_to_position(240)
    else:
        app.play_sound('Oops')
        arm_motor.run_to_position(25)
        for x in range(3):
            arm_motor.run_for_degrees(-100, speed=100)
            arm_motor.run_for_degrees(100, speed=100)

# Aktywuje robota i sprawia, że chwyta on jedną przesyłkę z każdej strony.
base_motor.run_to_position(0)
arm_motor.run_to_position(240)

base_motor.run_to_position(90)
arm_motor.run_to_position(25)

check_color()

base_motor.run_to_position(0)
arm_motor.run_to_position(240)
base_motor.run_to_position(270)
arm_motor.run_to_position(25)

check_color()

base_motor.run_to_position(0)
arm_motor.run_to_position(240)
```

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Breakdance

https://education.lego.com/pl-pl/lessons/prime-life-hacks/break-dance

Lekcja Breakdance wykorzystuje do programowania nasze bloki słów. Obecnie nie można jej przeprowadzić w ten sam sposób za pomocą języka Python.

Oto program, który przynajmniej poruszy Twój model.

```
from spike import PrimeHub, Motor, ColorSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
leg_motor = Motor('F')
arm_motor = Motor('B')
color_sensor = ColorSensor('D')


leg_motor.set_default_speed(-80)
arm_motor.set_default_speed(-80)


leg_motor.run_to_position(0)
arm_motor.run_to_position(0)
wait_for_seconds(1)

for x in range(10):
    hub.light_matrix.write("1")
    leg_motor.start()
    arm_motor.run_for_rotations(1)
    leg_motor.stop()
    wait_for_seconds(0.45)

    hub.light_matrix.write("2")
    leg_motor.start()
    arm_motor.run_for_rotations(1)
    leg_motor.stop()
    wait_for_seconds(0.45)

    hub.light_matrix.write("3")
    leg_motor.start()
    arm_motor.run_for_rotations(1)
    leg_motor.stop()
    wait_for_seconds(0.45)
```

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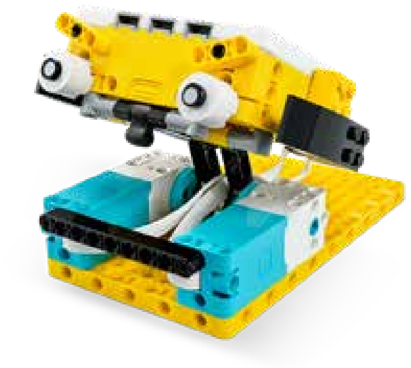
Powtórz 5 razy

https://education.lego.com/pl-pl/lessons/prime-life-hacks/repeat-5-times



```
from spike import PrimeHub, App, Motor
from spike.control import wait_until, wait_for_seconds
from spike.operator import equal_to


hub = PrimeHub()
app = App()
left_leg_motor = Motor('B')
right_leg_motor = Motor('F')
left_leg_motor.set_default_speed(50)
right_leg_motor.set_default_speed(-50)
left_leg_motor.start()
right_leg_motor.start()

wait_until(hub.motion_sensor.get_orientation, equal_to, 'leftside')
right_leg_motor.stop()
left_leg_motor.stop()

app.play_sound('Sport Whistle 1')

for count in range(5):
    left_leg_motor.set_default_speed(-50)
    right_leg_motor.set_default_speed(50)
    left_leg_motor.start()
    right_leg_motor.start()
    wait_until(hub.motion_sensor.get_orientation, equal_to, 'front')
    right_leg_motor.stop()
    left_leg_motor.stop()
    app.start_sound('Male Jump 1')
    hub.light_matrix.write(count + 1)
    wait_for_seconds(0.5)
    left_leg_motor.set_default_speed(50)
    right_leg_motor.set_default_speed(-50)
    left_leg_motor.start()
    right_leg_motor.start()
    wait_until(hub.motion_sensor.get_orientation, equal_to, 'leftside')
    right_leg_motor.stop()
    left_leg_motor.stop()
    wait_for_seconds(0.5)

app.play_sound('Sport Whistle 2')
```

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Deszcz czy słońce?

https://education.lego.com/pl-pl/lessons/prime-life-hacks/rain-or-shine

Lekcja Deszcz czy słońce? wykorzystuje do programowania nasze bloki słów. Obecnie funkcji prognozowania pogody nie można zaprogramować za pomocą języka Python.

Oto program, który przynajmniej poruszy model Synoptyka.

```
from spike import PrimeHub, App, Motor
from spike.control import wait_for_seconds

hub = PrimeHub()
app = App()
umbrella_motor = Motor("B")
glasses_motor = Motor("F")
YOUR_LOCAL_FORECAST = "sunny"

umbrella_motor.set_default_speed(100)
glasses_motor.set_default_speed(100)


# Ustawia elementy robota w prawidłowej pozycji startowej
umbrella_motor.run_to_position(45)
glasses_motor.run_to_position(300)

hub.speaker.beep(60, seconds=0.1)
hub.speaker.beep(72, seconds=0.1)

if YOUR_LOCAL_FORECAST == "sunny":
    # jeśli świeci słońce, załóż okulary przeciwsłoneczne
    glasses_motor.run_to_position(0)
    hub.light_matrix.show_image("SQUARE")
    wait_for_seconds(2)
    glasses_motor.run_to_position(300)
elif YOUR_LOCAL_FORECAST == "rainy":
    # lub jeśli pada deszcz, podnieś parasol
    umbrella_motor.run_to_position(340)
    app.play_sound("Rain")
    umbrella_motor.run_to_position(45)
else:
    # w innym przypadku pokaż X
    hub.light_matrix.show_image("NO")
```

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Prędkość wiatru

https://education.lego.com/pl-pl/lessons/prime-life-hacks/wind-speed

Lekcja Prędkość wiatru wykorzystuje do programowania nasze bloki słów. Obecnie funkcji prognozowania pogody nie można zaprogramować za pomocą języka Python.

Oto program, który przynajmniej poruszy Twój model.

```
from spike import App, Motor
from spike.control import wait_for_seconds

tilt_motor = Motor("A")
WIND_SPEED_FORECAST = 8

tilt_motor.set_default_speed(20)
tilt_motor.run_to_position(5)


if WIND_SPEED_FORECAST < 5.5:
    tilt_motor.run_for_degrees(30)
    wait_for_seconds(1)
    tilt_motor.run_for_degrees(-30)
else:
    tilt_motor.run_for_degrees(60)
    wait_for_seconds(1)
    tilt_motor.run_for_degrees(-60)
```

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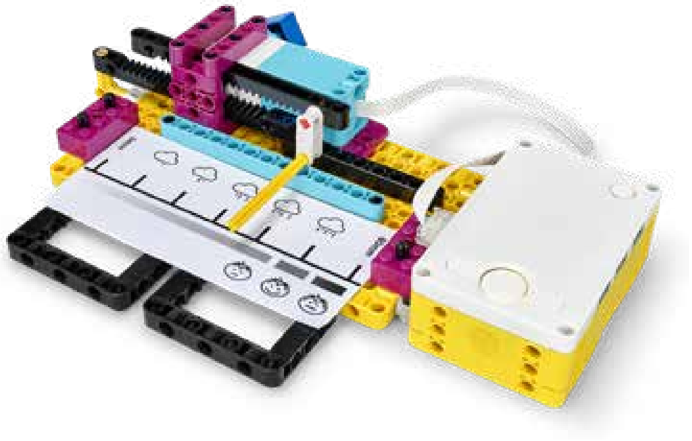
Miłość do warzyw

https://education.lego.com/pl-pl/lessons/prime-life-hacks/veggie-love



Lekcja Miłość do warzyw wykorzystuje do programowania nasze bloki słów. Obecnie funkcji prognozowania pogody nie można zaprogramować za pomocą języka Python.

Oto program, który przynajmniej poruszy Twój model.

```
from spike import PrimeHub, App, Motor

hub = PrimeHub()
app = App()
pointer_motor = Motor("E")
pointer_motor.set_default_speed(-50)

WEEK_RAIN = 50
ROTATION = 0


hub.left_button.wait_until_pressed()
pointer_motor.run_for_seconds(2)
pointer_motor.set_degrees_counted(0)
pointer_motor.set_default_speed(50)
pointer_motor.run_for_seconds(2)
hub.light_matrix.write(abs(pointer_motor.get_degrees_counted()))
rotation = int(week_rain * abs(pointer_motor.get_degrees_counted()) / 60)
print(ROTATION)


hub.right_button.wait_until_pressed()
pointer_motor.set_degrees_counted(0)
pointer_motor.set_default_speed(-50)
pointer_motor.run_for_degrees(ROTATION)
hub.light_matrix.write(WEEK_RAIN)
print(WEEK_RAIN)
```

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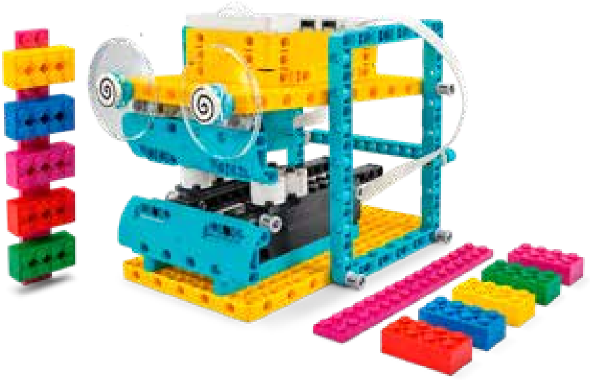
Gra logiczna

https://education.lego.com/pl-pl/lessons/prime-life-hacks/brain-game



```
from spike import PrimeHub, App, Motor, ColorSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
app = App()
mouth_motor = Motor('A')
color_sensor = ColorSensor('B')
candy1 = []
candy2 = []


while True:
    hub.left_button.wait_until_pressed()

    # To sprawi, że Mistrz gry zje cukierka oraz odczyta
i zapisze jego sekwencję kolorów na liście „candy1”.
    hub.light_matrix.off()
    candy1.clear()
    mouth_motor.set_default_speed(-50)
    mouth_motor.run_for_seconds(2)
    app.play_sound('Bite')
    app.play_sound('Bite')

    for x in range(5):
        candy1.append(color_sensor.get_color())
        wait_for_seconds(1)
        mouth_motor.set_default_speed(50)
        mouth_motor.run_for_degrees(95)
        wait_for_seconds(1)

    hub.right_button.wait_until_pressed()


   # To sprawi, że Mistrz gry zje cukierka oraz odczyta
i zapisze jego sekwencję kolorów na liście „candy2”.
    candy2.clear()
    mouth_motor.set_default_speed(-50)
    mouth_motor.run_for_seconds(2)
    app.play_sound('Bite')
    app.play_sound('Bite')

    for x in range(5):
        candy2.append(color_sensor.get_color())
        wait_for_seconds(1)
        mouth_motor.set_default_speed(50)
        mouth_motor.run_for_degrees(95)
        wait_for_seconds(1)

    # Podświetla pozycję czerwonego klocka, jeżeli znajduje
się on w tej samej pozycji w przypadku obu cukierków.
    candy1_red_index = candy1.index('red')
    candy2_red_index = candy2.index('red')
    for x in range(5):
        print(candy1[x])


    if candy1_red_index == candy2_red_index:
        for x in range(5):
            hub.light_matrix.set_pixel(x, candy1_red_
index)
        app.play_sound('Win')
    else:
        app.play_sound('Oops')
```

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Trener

https://education.lego.com/pl-pl/lessons/prime-life-hacks/the-coach

```
from spike import Motor
from spike.control import Timer, wait_for_seconds

left_leg_motor = Motor('F')
right_leg_motor = Motor('B')
timer = Timer()
left_leg_motor.run_to_position(0)
right_leg_motor.run_to_position(0)

while True:
    while timer.now() < 5:
        left_leg_motor.start_at_power(-80)
        right_leg_motor.start_at_power(80)
        wait_for_seconds(0.1)
        left_leg_motor.start_at_power(80)
        right_leg_motor.start_at_power(-80)
        wait_for_seconds(0.1)
```

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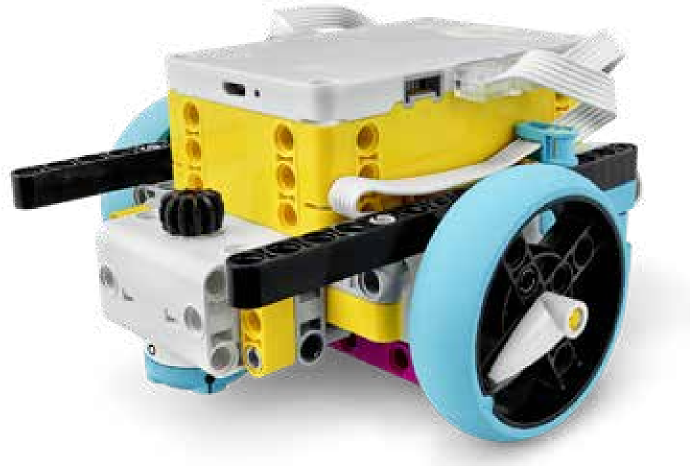
Obóz treningowy 1

https://education.lego.com/pl-pl/lessons/prime-competition-ready/training-camp-1-driving-around



```
from spike import MotorPair
from spike.control import wait_for_seconds


drive_motors = MotorPair('C', 'D')


drive_motors.set_default_speed(30)
drive_motors.set_motor_rotation(17.5, 'cm')


wait_for_seconds(1)

for x in range(4):
    drive_motors.move(10, 'cm')
    wait_for_seconds(0.5)
    drive_motors.move(182, 'degrees', steering=100)
```

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Obóz treningowy 2

https://education.lego.com/pl-pl/lessons/prime-competition-ready/training-camp-2-playing-with-objects

```
from spike import PrimeHub, MotorPair, Motor, DistanceSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
drive_motors = MotorPair('C', 'D')
grabber_motor = Motor('E')
distance_sensor = DistanceSensor('F')


drive_motors.set_default_speed(30)
drive_motors.set_motor_rotation(17.5, 'cm')
grabber_motor.set_default_speed(-20)
grabber_motor.run_for_seconds(1)
grabber_motor.set_default_speed(20)
grabber_motor.run_for_degrees(75)

hub.speaker.beep(60)
hub.speaker.beep(72)

hub.right_button.wait_until_pressed()

wait_for_seconds(1)

drive_motors.start()
distance_sensor.wait_for_distance_closer_than(10, 'cm')
drive_motors.stop()

grabber_motor.run_for_degrees(-75)

hub.speaker.beep(60)
hub.speaker.beep(72)

drive_motors.move(-20, 'cm')
```

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Obóz treningowy 3

https://education.lego.com/pl-pl/lessons/prime-competition-ready/training-camp-3-react-to-lines

```
from spike import PrimeHub, MotorPair, ColorSensor
from spike.control import wait_for_seconds

hub = PrimeHub()
drive_motors = MotorPair('C', 'D')
color_sensor = ColorSensor('B')

drive_motors.set_default_speed(50)
POWER = 50

while True:
    if hub.left_button.was_pressed():
        drive_motors.start()
        color_sensor.wait_until_color('black')
        drive_motors.stop()

    if hub.right_button.was_pressed():
        while True:
            drive_motors.start_tank_at_power(0, POWER)
            color_sensor.wait_until_color('black')
            drive_motors.start_tank_at_power(POWER, 0)
            color_sensor.wait_until_color('white')
```

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Budowanie zaawansowanego robota bazowego

https://education.lego.com/pl-pl/lessons/prime-competition-ready/assembling-an-advanced-driving-base

```
from spike import PrimeHub, MotorPair
from spike.control import wait_for_seconds, wait_until
from spike.operator import greater_than, less_than


hub = PrimeHub()
drive_motors = MotorPair('A', 'E')


drive_motors.set_default_speed(50)
drive_motors.set_motor_rotation(27.63, 'cm')


wait_for_seconds(1)

drive_motors.move(20, 'cm')
drive_motors.move(-20, 'cm')

drive_motors.move(20, 'cm', steering=-40)

hub.motion_sensor.reset_yaw_angle()

drive_motors.start(steering=100)
wait_until(hub.motion_sensor.get_yaw_angle, greater_than, 90)
drive_motors.stop()

drive_motors.start(steering=-100)
wait_until(hub.motion_sensor.get_yaw_angle, less_than, 0)
drive_motors.stop()
```

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Mój kod, nasz program

https://education.lego.com/pl-pl/lessons/prime-competition-ready/my-code-our-program

```
from spike import PrimeHub, MotorPair
from spike.control import wait_for_seconds


hub = PrimeHub()
drive_motors = MotorPair('A', 'E')


drive_motors.set_default_speed(50)
drive_motors.set_motor_rotation(27.63, 'cm')


def square():
    for x in range(4):
        drive_motors.move(1.5, 'rotations')
        drive_motors.move(0.365, 'rotations', steering=100)


def triangle():
    for x in range(3):
        drive_motors.move(1.5, 'rotations')
        drive_motors.move(0.486, 'rotations', steering=100)


def circle():
    drive_motors.move(3, 'rotations', steering=60)


wait_for_seconds(1)

square()
hub.speaker.beep()

triangle()
hub.speaker.beep()

circle()
hub.speaker.beep()
```

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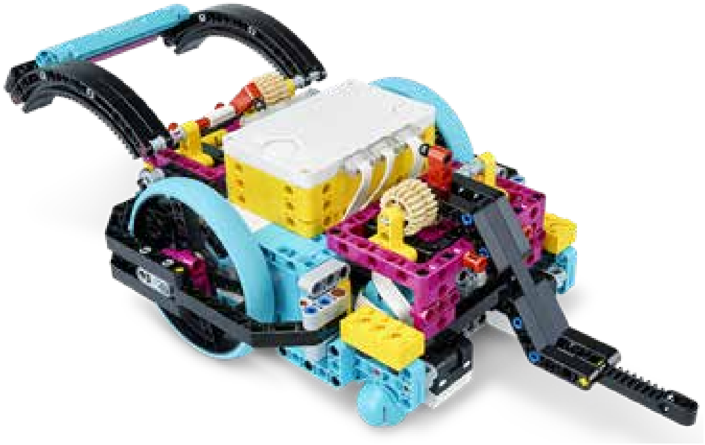
Czas na ulepszenie

https://education.lego.com/pl-pl/lessons/prime-competition-ready/time-for-an-upgrade



```
from spike import PrimeHub, Motor


hub = PrimeHub()
lift_arm_motor = Motor('D')
dozer_blade_motor = Motor('C')


lift_arm_motor.set_default_speed(-100)
lift_arm_motor.run_for_seconds(1)
dozer_blade_motor.set_default_speed(-100)
dozer_blade_motor.run_for_seconds(1)

lift_arm_motor.set_default_speed(100)
lift_arm_motor.run_for_degrees(70)
dozer_blade_motor.set_default_speed(100)
dozer_blade_motor.run_for_degrees(70)
hub.speaker.beep()

lift_arm_motor.run_for_degrees(180)
lift_arm_motor.run_for_degrees(-180)
dozer_blade_motor.run_for_degrees(180)
dozer_blade_motor.run_for_degrees(-180)
hub.speaker.beep()

lift_arm_motor.run_for_degrees(180, speed=15)
lift_arm_motor.run_for_degrees(-180, speed=15)
dozer_blade_motor.run_for_degrees(180, speed=15)
dozer_blade_motor.run_for_degrees(-180, speed=15)
```

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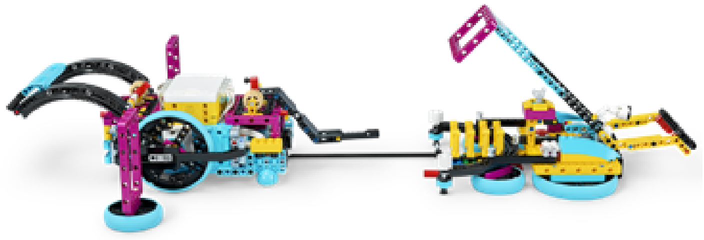
Gotowi na misję

https://education.lego.com/pl-pl/lessons/prime-competition-ready/mission-ready



```
from spike import Motor, MotorPair
from spike.control import wait_for_seconds


dozer_blade_motor = Motor('C')
lift_arm_motor = Motor('D')
drive_motors = MotorPair('A', 'E')


drive_motors.set_default_speed(25)
drive_motors.set_motor_rotation(27.63, 'cm')


dozer_blade_motor.start(-100)
lift_arm_motor.start(-100)
wait_for_seconds(1)
dozer_blade_motor.stop()
lift_arm_motor.stop()

dozer_blade_motor.run_for_degrees(70, speed=100)
lift_arm_motor.run_for_degrees(20, speed=100)

drive_motors.move(-2, 'cm')
drive_motors.move(10.5, 'cm')

dozer_blade_motor.run_for_degrees(180, speed=40)

drive_motors.move(-6, 'cm')

dozer_blade_motor.run_for_degrees(-180, speed=60)
dozer_blade_motor.run_for_degrees(180, speed=60)

drive_motors.move(7, 'cm')

dozer_blade_motor.run_for_degrees(-180, speed=60)

drive_motors.move(0.405, 'rotations', steering=-100)
drive_motors.move(60.5, 'cm', steering=-30)
drive_motors.move(34, 'cm')
drive_motors.move(32, 'cm', steering=-50)
drive_motors.move(17.5, 'cm')
drive_motors.move(0.415, 'rotations', steering=-100)
drive_motors.move(32, 'cm')
```

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Podaj klocek

https://education.lego.com/pl-pl/lessons/prime-extra-resources/pass-the-brick

```
from spike import Motor, PrimeHub


hub = PrimeHub()
grabber_motor = Motor('F')


# To sprawi, że ręka otworzy się raz na początku.
grabber_motor.run_for_seconds(1)

while True:
    # To sprawi, że ręka zamknie się, kiedy naciśniesz lewy przycisk na Hubie.
    hub.left_button.wait_until_pressed()
    grabber_motor.set_stall_detection(False)
    grabber_motor.start(-75)

   # To sprawi, że ręka otworzy się, kiedy zwolnisz lewy przycisk na Hubie.
    hub.left_button.wait_until_released()
    grabber_motor.set_stall_detection(True)
    grabber_motor.start(75)
```

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Pomysły w stylu LEGO!

https://education.lego.com/pl-pl/lessons/prime-extra-resources/ideas-the-lego-way

```
from spike import PrimeHub
from spike.control import wait_for_seconds


hub = PrimeHub()


while True:
    if hub.left_button.was_pressed():
        hub.light_matrix.write('3')
        wait_for_seconds(1)
        hub.light_matrix.write('2')
        wait_for_seconds(1)
        hub.light_matrix.write('1')
        wait_for_seconds(1)
        hub.light_matrix.off()
        hub.speaker.beep(60, 0.5)
        hub.speaker.beep(72, 0.5)

    if hub.right_button.was_pressed():
        hub.light_matrix.write('5')
        wait_for_seconds(60)
        hub.light_matrix.write('4')
        wait_for_seconds(60)
        hub.light_matrix.write('3')
        wait_for_seconds(60)
        hub.light_matrix.write('2')
        wait_for_seconds(60)
        hub.light_matrix.write('1')
        wait_for_seconds(60)
        hub.light_matrix.off()
        hub.speaker.beep(60, 0.5)
        hub.speaker.beep(72, 0.5)
```

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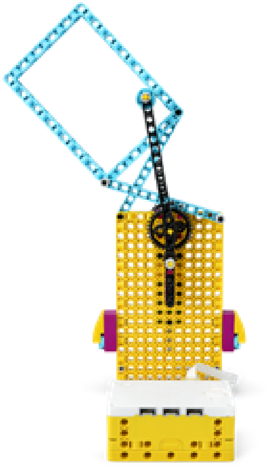
Co to takiego?

https://education.lego.com/pl-pl/lessons/prime-extra-resources/what-is-this



```
from spike import Motor


motor = Motor('F')


motor.set_stall_detection(False)

for x in range(5):
    motor.set_default_speed(50)
    motor.run_for_seconds(2)
    motor.set_default_speed(-50)
    motor.run_for_seconds(2)
```

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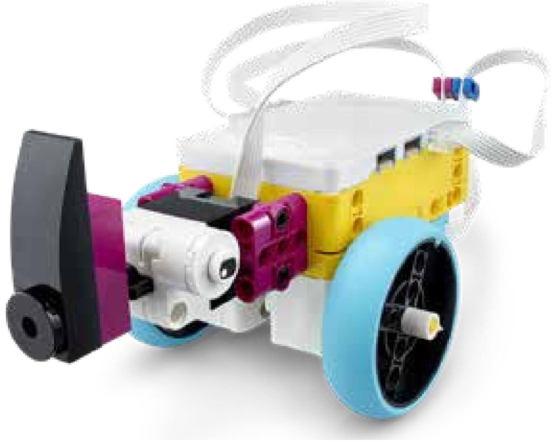
Przebywanie odległości

https://education.lego.com/pl-pl/lessons/prime-extra-resources/going-the-distance



```
from spike import MotorPair


drive_motors = MotorPair('B', 'A')


drive_motors.set_default_speed(50)


drive_motors.move(10, 'rotations')
drive_motors.stop()
```

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Bramka!

https://education.lego.com/pl-pl/lessons/prime-extra-resources/goal

```
from spike import PrimeHub, Motor
from spike.control import wait_for_seconds


hub = PrimeHub()
kicker = Motor('A')
kicker.set_default_speed(100)


while True:
    kicker.run_to_position(0)

    hub.left_button.wait_until_pressed()
    kicker.run_for_rotations(1)
    wait_for_seconds(1)
```