

00_crazyflie_sim_student_ms

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Part of the InnovatED STEM and DroneBlocks Land, Air, and Sea Robotics Curriculum
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1 Let's Fly the Crazyflie Drone!

Welcome! In this notebook, you'll learn to **code a flying robot** using simple commands.

Each exercise will show you what to do, and you'll just need to **fill in some numbers**. We'll guide you with helpful comments in the code!

1.1 Motion Commands and What They Do

Command	What It Does	Parameters (What to change)
<code>takeoff()</code>	Makes the drone go up and hover	height (how high, in meters), speed
<code>land()</code>	Brings the drone down to land	speed (how fast to land)
<code>forward()</code>	Flies forward	distance, speed
<code>backward()</code>	Flies backward	distance, speed
<code>left()</code>	Moves left	distance, speed
<code>right()</code>	Moves right	distance, speed
<code>up()</code>	Goes higher	distance, speed
<code>down()</code>	Goes lower	distance, speed
<code>rotate()</code>	Turns around	angle (degrees), time (seconds)
<code>circle_left()</code>	Flies in a left circle	radius, speed, angle
<code>circle_right()</code>	Flies in a right circle	radius, speed, angle

```
[ ]: # First, let's get our drone ready!
from crazyflie_sim import CrazyflieSimulator
drone = CrazyflieSimulator(real=False) # We are using the simulator for safety!
```

1.2 Exercise 1: Take Off

Change the height to **0.4 meters** and the speed to **0.2**

```
[ ]: # Let's make the drone take off!
      # Change the numbers to: height = 0.4, speed = 0.2
```

```
drone.takeoff(0.4, 0.2)
```

1.3 Exercise 2: Fly Forward

Now move forward **0.3 meters** at a speed of **0.2**

```
[ ]: # Fly forward!  
# Change the numbers to: distance = 0.3, speed = 0.2
```

1.4 Exercise 3: Move Left

Fly left for **0.2 meters** at speed **0.2**

```
[ ]: # Go left!
```

1.5 Exercise 4: Circle Time!

Fly a circle to the **left**, radius **0.2 meters**, speed **0.2**, full circle **360 degrees**

```
[ ]: # Fly in a circle!  
# radius = 0.2, speed = 0.2, angle = 360
```

1.6 Exercise 5: Turn Around

Turn **90 degrees** in place in **1 second**

```
[ ]: # Turn the drone
```

1.7 Exercise 6: Land Safely

Land the drone at **0.2 meters per second**

```
[ ]: # Land the drone
```