

# Lesson Plan

- Lesson 1.1: Neural Networks
- Lesson 1.2: Image Recognition Training
- Lesson 2.1: Programming Fundamentals
- Lesson 2.2: Conditional Programming
- Lesson 2.3: Loops**
- Lesson 2.4: Functional Programming
- Lesson 3.1: Basic and Advance Training
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- Lesson 3.3: Autonomous Systems
- Lesson 4 : Debugging your code

## Lesson 2.3 Loops

Warm-up	(10 mins)
Conditions	(10 mins)
Loops	(10 mins)
Wrap up	(05 mins)

### Prerequisites:

In our previous chapters we discussed programming languages. If you haven't already, please refer to pages 8 & 10

### Lesson Overview:

In this chapter, we will introduce a programming concept called loops..

### Lesson objective:

To make students understand programming concept of loops.

### Requirements:

1. CoderMindz game board
2. Decks of Coder Mindz Code cards
3. A sports ball

### Getting started:

1. We'll be playing Bot Movements => Advanced Code Cards => Loops from our rule book. The goal is to teach students about loops in programming.
2. Instructors will explain the rule book and students will do the exercise.
3. After the rule book is explained, arrange the cards and the board. After the initial setup, explain cards, movements of the bot, choose starting position and get ready to start the game.

### **Loops:**

In programming, a loop is a programming concept that keeps on executing the instructions inside a loop until the loop is completed. It is used when we have to do something repeatedly.

#### **While loops:**

Take, for example, John needs to run 10 laps on the ground and the instructor wants to make sure that John doesn't stop before 10 laps are completed. So, the instructor will create a loop to check if John is running and keep a count on his activity.

This is an example of While loop:

```
Count = 0
```

```
While (count < 10):
```

```
    // Keep John running
```

```
    // For each lap John completes, count = count + 1
```

Now the above loop will keep on running until the count of laps reaches 10

### Board Activity:

Explain students about our advanced code cards having the four types of loops in the gameplay:

1. While the circle to the **LEFT** is not **SAFE** and not **BLOCKED**, take **one** step on the **LEFT**.
2. While the circle to the **RIGHT** is not **SAFE** and not **BLOCKED**, take **one** step on the **RIGHT**.
3. While the circle on the front is not **SAFE** and not **BLOCKED**, take steps **FORWARD** and stop **one** circle before **SAFE** circle.
4. While the circle on the **BACK** is not **SAFE** and not **BLOCKED**, take steps **BACKWARDS** and stop **one** circle before **SAFE** circle.

### Extended learning:

Now that the students have already formed groups in the previous chapter, we'll conduct another exercise to explain the concept of loops.

1. We asked students to form a group of four members in our previous exercise.
2. To proceed further in the game, the students need to be in a group of four to proceed further.  
(Note: Please explain the student(s) without the group that this is just to explain the topic, and that they'll be allowed to play the game)
3. Now as long as the students are in a group of four, ask them to mutually decide on a group name. Only students in the groups can decide a group name.
4. Now, you as an instructor of the course will visit each group and note down their group name.

5. After noting each group, explain to students how you repeatedly went to each group while(as long as) they were in the size of four.