

## Algorithm and logic-based coding

**Objective:** Thought programming is hard? Wonder how to start coding? Amazed by technology and applications? Curious about solving problems? We got you. Programming language and framework are widely taught out there but we see the importance of algorithm, data structure and logic-based coding and we place emphasis on them in this course. **We aim to provide Computer Science concepts and mentor our students to build things they care about, to automate the boring stuff.** Here Python is chosen for teaching since it's an interpreted, intuitive, high-level, general-purpose programming language that is good for beginners. By the end of the course, students will be confident in writing lines of code in Python and have a thought process developed ready to tackle any problem and build anything they are curious about. .

**Course format:** 60 minutes

<b>Session</b>	<b>Topic</b>	<b>Objectives</b>
1	<b>Programming Sense and Ideation</b> <i>Lightbot</i>	<ul style="list-style-type: none"><li>• Students get to write set of instructions to communicate with computer through Lightbot game</li><li>• Students get to share what they want to build for fun or to improve life. Something that they wish existed or something to automate the boring stuff</li></ul>
2	<b>Conditional Statement</b> <i>Choose your own adventure game</i>	<ul style="list-style-type: none"><li>• Students learn the importance of if-else statement and how to implement it</li><li>• Students get to see real-life applications of the concept and apply it to make Choose your own adventure game</li></ul>
3	<b>Function and Variable</b> <i>Tic tac toe game</i>	<ul style="list-style-type: none"><li>• Students learn the application of function, how to declare and call a function</li><li>• Students get to understand variables, how to initiate one and why we need it</li><li>• Students get introduction to</li></ul>

		build Tic tac toe game
4	<b>Loop: For loop and while loop</b> <i>Guessing a number game</i>	<ul style="list-style-type: none"> <li>• Students gain an understanding of loop, specifically for loop and while loop and how to write them.</li> <li>• Students get to apply the concept in Guessing a number game.</li> </ul>
5	<b>List and Array</b> <i>Writing a checkout program</i>	<ul style="list-style-type: none"> <li>• Students are introduced to list and array data structure.</li> <li>• Students get to apply it into writing a checkout program</li> </ul>
6	<b>Algorithm</b> <i>Counting and sorting algorithm</i>	<ul style="list-style-type: none"> <li>• Students learn algorithms behind famous applications and technology such as Google, Facebook</li> <li>• Students gain experience developing algorithms.</li> </ul>
7	<b>Problem Solving</b> <i>Code challenges</i>	<ul style="list-style-type: none"> <li>• Students learn to cultivate thought process in approaching and tackling a problem.</li> <li>• Students gain hands-on experience in solving code challenges by applying all Computer Science fundamentals and problem solving skill</li> </ul>
8	<b>Code combat, Debug and Get unstuck</b>	<ul style="list-style-type: none"> <li>• Students get to play Code combat - a game-based coding learning platform and get to tackle different challenges provided</li> <li>• Students gain experience in debugging</li> <li>• Students learn to maintain a good attitude toward solving problems by reaching out to others, by researching online and by asking good questions.</li> </ul>