



# CODE WITH PYTHON:

FROM BEGINNER TO INNOVATOR IN 12 MONTHS

## WHAT IS PYTHON?

Python is a high-level, general-purpose computer programming language. It has been used in many popular applications: YouTube, DropBox, Google, Quora, Instagram, BitTorrent, Spotify, and Reddit.

In this course, you can use Python to program computer games, animations, dynamic websites, development boards and much more.

## WHY PYTHON?

Python is now a part of many high school Digital Technologies subject and is often a first year university subject in Bachelor of IT degrees. Python has simple syntax, is highly readable and useful for any beginner project. It is quick to learn and allows you move on from block coding to a text-based programming language to build fun, creative projects.

## OVERVIEW

This is an overview of our 12 month Python programming pathway. It is made up of four 8-week courses, delivered each school term.

```
1 # we want to use random code
2 import random
3
4 # options list
5 options = ["rock", "paper", "scissors"]
6
7 # get user input
8 userChoice = input("rock, paper or scissors?")
9
10 # check user chose valid option, repeat until they do
11 while userChoice not in options:
12     userChoice = input("Please try again, rock, paper or scissors?")
13
14 # computer chooses random option
15 computerChoice = options[random.randint(0,2)]
16 print("The computer has chosen " + computerChoice + "\n")
17
18 # process choices -> same = tie, rock > scissors, scissors > paper, paper > rock
19 if computerChoice == userChoice:
20     print("Tie!")
21 elif computerChoice == "rock":
22
23     if userChoice == "paper":
24         print("You win!")
25     elif userChoice == "scissors":
26         print("You lose!")
27     else:
28         print("Tie!")
29 elif computerChoice == "paper":
30     if userChoice == "rock":
31         print("You win!")
32     elif userChoice == "scissors":
33         print("You lose!")
34     else:
35         print("Tie!")
36 elif computerChoice == "scissors":
37     if userChoice == "rock":
38         print("You win!")
39     elif userChoice == "paper":
40         print("You lose!")
41     else:
42         print("Tie!")
```

Powered by trinket  
rock, paper or scissors? rock  
The computer has chosen scissors  
  
You win!

LEVEL 1 COURSE	LEVEL 2 COURSE	LEVEL 3 COURSE	LEVEL 4 COURSE
Discover the fundamentals of computational thinking.	Consolidate fundamentals & explore more challenging concepts.	Apply more advanced concepts in more complex problems.	Extend yourself. Design your own projects. Let your imagination guide your development.
<ul style="list-style-type: none"> <li>- Commands</li> <li>- Numbers</li> <li>- Strings</li> <li>- Lists</li> <li>- Input/Output</li> <li>- Conversions</li> <li>- Loops</li> <li>- Branch statements</li> <li>- Random numbers</li> <li>- Introduction to Turtle</li> </ul>	<ul style="list-style-type: none"> <li>- Revision of basic concepts</li> <li>- More complex uses of Turtle</li> <li>- Printing and input</li> <li>- Loops</li> <li>- Conditional statements</li> <li>- Variables</li> <li>- Lists</li> <li>- Random numbers</li> <li>- Timers</li> <li>- Basics of dictionaries</li> <li>- Introduction to using files as input and output</li> </ul>	<ul style="list-style-type: none"> <li>- Application of concepts in different situations</li> <li>- Advanced strings</li> <li>- Tuples</li> <li>- Coordinates</li> <li>- Keybinding</li> <li>- Creating functions</li> <li>- Timers</li> <li>- Advanced list techniques</li> <li>- Advanced dictionaries</li> <li>- More challenging use of files as input and output</li> </ul>	<ul style="list-style-type: none"> <li>- String manipulation</li> <li>- Writing and reading files</li> <li>- Program control via key press</li> <li>- Objects</li> <li>- Classes</li> <li>- Inheritance</li> <li>- Loops</li> <li>- Conditionals</li> <li>- Variables</li> <li>- Data structures</li> <li>- More challenging functions</li> </ul>
Projects built: <ul style="list-style-type: none"> <li>- Dragon Door</li> <li>- for Loop Shapes</li> <li>- Geometry Turtle</li> <li>- Interactive Turtle</li> <li>- Magic 8 ball</li> <li>- Wandering Turtle</li> </ul>	Projects built: <ul style="list-style-type: none"> <li>- Caesar Cipher</li> <li>- Functions</li> <li>- Phonebook</li> <li>- Rock, Paper, Scissors</li> <li>- Shopping List</li> <li>- ToDo List</li> <li>- Turtle Clock</li> </ul>	Projects built: <ul style="list-style-type: none"> <li>- Advanced Strings</li> <li>- Customize turtle</li> <li>- Controllable turtle</li> <li>- Sierpinski's triangle</li> <li>- Guess the random number</li> </ul>	Projects built: <ul style="list-style-type: none"> <li>- Bagels</li> <li>- Dragon</li> <li>- Jokes</li> <li>- Pong</li> <li>- Tic Tac Toe</li> <li>- Build your own project</li> </ul>

