(Py200) Computational Thinking with Python 

Course Description:
(Py200) Computational Thinking with Python rides on our core Python Coding course to introduce computational thinking to learners.

For students who have completed **(Py100) Everyone can code with Python**, or have similar Python coding experiences, this course introduces the core concepts of Computational Thinking, namely Decomposition, Pattern Recognition, Abstraction and Algorithm.

Through various challenging activities in Mathematics, text analysis and turtle graphics, students learn valuable computational thinking skills which are transferable in other domains and subjects

Details:

Date: **Time:**	11 Dec to 13 Dec (Wednesday to Friday) 2:30 pm to 5:00 pm (Wed) 10:30 am to 1:00 pm & 2:30 pm to 5:00 pm (Thu & Fri)
Venue:	Math Arena Enrichment Centre
Address:	Blk 488B Tampines Street 45 #B1-147 Singapore 521488

Prerequisite:
- Completed our core Python Module **(Py100) Everyone can Code with Python** or have similar Python Coding experiences
- Participated in Mathematics Olympiad or attended Fusion Math Course (P4, P5 or P6)

Recommended Age: 11 years and above
Session Format: 5 x 2 ½ hours
Fee: S$540

Trainer:
Mr. Dean Ang (Honours Degree, National University of Singapore, Double Major in Mathematics and Computational Science; Ex-HOD ICT of Raffles Institution and School of Science and Technology, Singapore)

Who this course is for:
This course is designed with challenge-based activities and hosted on Google's online learning platform. It is suitable for:
- Everyone who knows any programming and loves puzzles and problem solving
- Beginner programmers looking get more creative and tackle open-ended problems
- O-Level Computing students, looking to enhance their python coding skills
- Teachers / Tutors looking to find an ideal learning sequence to teach Python programming

Course Outline:

Session 1 - Recap / I/O and Data Processing ● Recapitulation - The Basics ● Input-Process-Output ● Files I/O ● Working with Data	**Session 2 - Decomposing a Complex Problem using Functions** ● Functions in Python ● Local vs Global Variables ● Recursion ● Applications - Fibonacci, Factorial
Session 3 - Algorithm with Mathematics Challenges ● Algorithms with Python Modules ● Maths and Random ● Itertools ● Application - Prime, LCM/HCF	**Session 4 - Pattern Recognition with Text Analysis Challenges** ● Pattern Recognition with Strings ● Indexing, Slicing ● Formatting String ● Abstraction with Additional Data Types - Dictionaries / Sets
Session 5 - Turtle Graphics Challenges ● Turtle Module ● Geometric Shape Challenges	

Learners will take home: Project files/Notes, badges and certificate upon completion

Frequently Asked Questions (FAQ)

1. **What is Python?**
   Python is a general-purpose programming language that has been ranked consistently number one in many coding language popularity surveys. It is supported by big technology companies like Google.

2. **Why choose Python?**
   Python has an easy-to-understand syntax, yet versatile and powerful libraries, making it a superb choice as an introductory programming language for first-time coders.

3. **How will coding help my child in School?**
   Coding helps your child in logical thinking and problem-solving skills. The ability to break down a complex problem into many smaller and simpler tasks enhances the chances of a successful solution. The skills are easily transferable to other subjects such as Math and Science.

4. **What age group is suitable for this course?**
   The recommended age is 10 years old onwards. Learners must be comfortable with the keyboard and can type text-based input reasonably fast. Learners should preferably complete our core Python module **(Py100) Everyone can Code with Python** which will equip them with Python fundamentals.

5. **My child is new programming. Will he/she be able to follow?**
   The course is **NOT** designed for beginners with zero programming experience. Beginners are advised to take up our core Python module **(Py100) Everyone can Code with Python**.

6. **Do I need to bring my computer laptop or any other equipment?**
   All equipment and notes will be provided. Learners may only need to bring their water bottle and basic writing materials in case they want to plan on a piece of paper.