

# **AP Computer Science Principles@Beijing National Day School**

## **Individual Project**

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### **Part A: The Individual Project Scope**

- During this period of time, remaining students will be expected to work productively on an individual project.
- You will be expected to work on a Massively Open Online Course(MOOC), and you are free to choose the particular course.
- Being on task, working, and learning during these class periods is expected of every student in this project.

### **Part B: Massively Open Online Courses(MOOCs)**

**You are not required to pay for any of these courses!** There is always a free “Audit this course” option offered. The following are some suggested courses which are both popular and highly rated. However, you are free to browse the catalogs of these MOOC providers, and select other courses, if you wish.

#### **edX: An online learning destination and MOOC provider:**

<http://www.edx.org>

##### **Learning The Python Programming Language(Beginner)**

- CS for All: Introduction to Computer Science and Python Programming
  - Institution: Harvey Mudd College
  - <https://www.edx.org/course/cs-all-introduction-computer-science-harvey-muddx-cs005x-0>
- Introduction to Computing using Python
  - Institution: Georgia Tech
  - <https://www.edx.org/course/introduction-computing-using-python-gtx-cs1301x>
- Introduction to Programming using Python
  - Institution: University of Texas, Arlington
  - <https://www.edx.org/course/introduction-to-programming-using-python>

##### **Python Programming(Intermediate)**

- 6.00.1x: Introduction to Computer Science and Programming Using Python
  - Institution: Massachusetts Institute of Technology
  - <https://www.edx.org/course/introduction-computer-science-mitx-6-00-1x-11>

- 6.00.2x: Introduction to Computational Thinking and Data Science
  - Institution: Massachusetts Institute of Technology
  - <https://www.edx.org/course/introduction-computational-thinking-data-mitx-6-00-2x-6>

### **Programming, Software Engineering and Web Development(Advanced)**

- CS50x: Introduction to Computer Science
  - Institution: Harvard
  - <https://www.edx.org/course/introduction-computer-science-harvardx-cs50x>

### **Learning The Java Programming Language(Beginner)**

- HKUST.1x: Introduction to Java Programming, Part 1
  - Institution: The Hong Kong University of Science and Technology
  - <https://www.edx.org/course/introduction-java-programming-part-1-hkustx-comp102-1x-5>
- HKUST.2x: Introduction to Java Programming, Part 2
  - Institution: The Hong Kong University of Science and Technology
  - <https://www.edx.org/course/introduction-java-programming-part-2-hkustx-comp102-2x-7>
- UC3M.1x: Introduction to Java Programming, Part 1: Starting to Code in Java
  - Institution: Universidad Carlos III de Madrid
  - <https://www.edx.org/course/introduction-java-programming-starting-uc3mx-3t2017>
- UC3M.2x: Introduction to Java Programming, Part 2: Writing Good Code
  - Institution: Universidad Carlos III de Madrid
  - <https://www.edx.org/course/introduction-java-programming-writing-uc3mx-it-1-2x>
- UC3M.3x: Introduction to Java Programming, Part 3: Fundamental Data Structures and Algorithms
  - Institution: Universidad Carlos III de Madrid
  - <https://www.edx.org/course/introduction-java-programming-uc3mx-it-1-3x>

### **Learning The JavaScript Programming Language(Beginner)**

- PennX: Programming for the Web with JavaScript
  - Institution: University of Pennsylvania
  - <https://www.edx.org/course/programming-web-javascript-pennx-sd4x>

### **Mobile Development with Android(Intermediate)**

- HKUST.Ax: Introduction to Mobile Application Development using Android
  - Institution: The Hong Kong University of Science and Technology
  - <https://www.edx.org/course/introduction-mobile-application-hkustx-comp107x-6>

### **Khan Academy: an educational web portal**

**<http://www.khanacademy.org>**

#### **Front End Web Design(Beginner)**

- Computer Programming with HTML, CSS and JavaScript
  - Institution: Khan Academy
  - <https://www.khanacademy.org/computing/computer-programming>

#### **Algorithms(Intermediate)**

- Computer Science: Introduction to Algorithms
  - Institution: Khan Academy
  - <https://www.khanacademy.org/computing/computer-science>

### **MIT OpenCourseWare: MIT's online learning platform:**

**<https://ocw.mit.edu/index.htm>**

#### **Learning The Python Programming Language(Beginner)**

- 6.0001: Introduction to Computer Science and Programming in Python
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/>
- 6.0002: Introduction to Computational Thinking and Data Science
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-0002-introduction-to-computational-thinking-and-data-science-fall-2016/>
- 6.S095: Programming for the Puzzled
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-s095-programming-for-the-puzzled-january-iap-2018/>

## **Mathematics and Probability(Intermediate)**

- 6.042J: Mathematics for Computer Science
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-spring-2015/>
- 6.041SC: Probabilistic Systems Analysis and Applied Probability
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-041sc-probabilistic-systems-analysis-and-applied-probability-fall-2013/>

## **Artificial Intelligence(Advanced)**

- 6.034: Artificial Intelligence
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificial-intelligence-fall-2010/>

## **Algorithms(Advanced)**

- 6.006: Introduction to Algorithms
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/>
- 6.046J: Design and Analysis of Algorithms
  - Institution: Massachusetts Institute of Technology
  - <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-design-and-analysis-of-algorithms-spring-2015/>