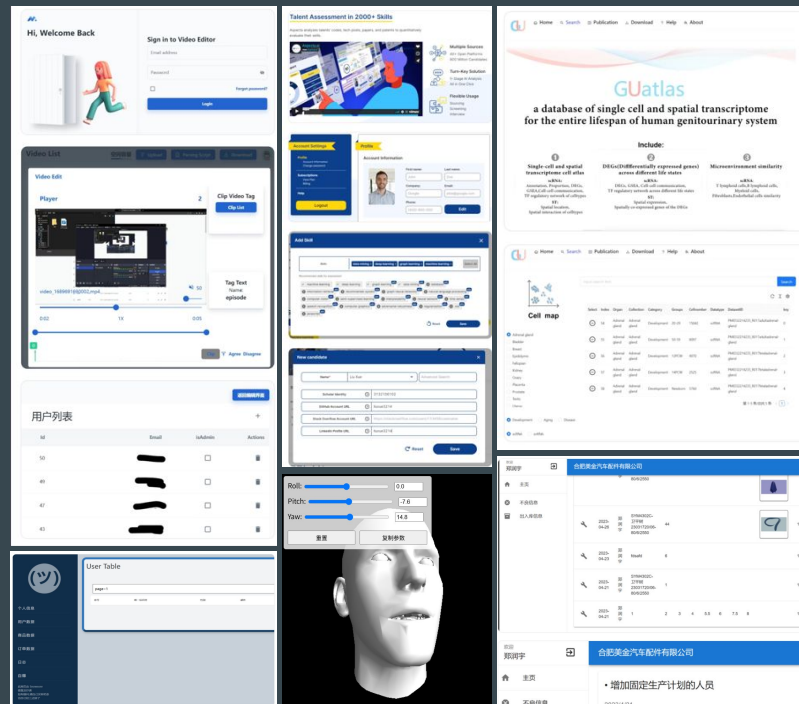# AP Computer Science A

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Trial Lesson 1

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4. Coding for hobby

Introduction

What Is AP Computer Science A?

- College-level programming course using Java

- Focuses on writing, analyzing, and debugging code

- Helps build strong problem-solving and logical thinking skills

- Prepares students for further studies in computer science

What are we going to learn in this course?

- Java syntax and basic programming structures

- Control flow logic

- Object-oriented programming (OOP)

- Working with arrays and ArrayLists

- Computational thinking and problem-solving

  - Breaking problems into smaller parts

  - Designing step-by-step algorithms

  - Thinking like a computer to find efficient solutions

Where is it used in real life?

- University Projects – Data Analysis and Research

  - Psychology, Economics, Biology

- Problem Solving – Thinking Like a Programmer

  - Structured, Logical thinking that helps solve problems

- Understanding and Collaborating with AI

- Becoming a Software Engineer or Tech Professional

AP CSA Exam Overview

Exam

Section	Question Type	Number of Questions	Exam Weighting	Timing
I	**Multiple-choice questions**	40	50%	90 minutes
II	**Free-response questions**	4		90 minutes
	Question 1: Methods and Control Structures (9 points)		12.5%	
	Question 2: Class (9 points)		12.5%	
	Question 3: Array/ArrayList (9 points)		12.5%	
	Question 4: 2D Array (9 points)		12.5%	

The exam assesses content from the three big ideas for the course:

Big Idea 1: Modularity

Big Idea 2: Variables

Big Idea 3: Control

Course

Units	Exam Weighting
Unit 1: Primitive Types	**2.5–5%**
Unit 2: Using Objects	**5–7.5%**
Unit 3: Boolean Expressions and `if` Statements	**15–17.5%**
Unit 4: Iteration	**17.5–22.5%**
Unit 5: Writing Classes	**5–7.5%**
Unit 6: Array	**10–15%**
Unit 7: `ArrayList`	**2.5–7.5%**
Unit 8: 2D Array	**7.5–10%**
Unit 9: Inheritance	**5–10%**
Unit 10: Recursion	**5–7.5%**

MCQ 1

1. Evaluate the following expression: `4 + 6 % 12 / 4`

(A) 1
(B) 2
(C) 4
(D) 4.5
(E) 5

MCQ 2

2. Which of the following expressions does NOT evaluate to `0.2`?

(A) `(1.0 * 2) / (1.0 * 10)`
(B) `2.0 / 10`
(C) `(double) 2 / 10`
(D) `(double)(2 / 10)`
(E) `Math.sqrt(4) / Math.sqrt(100)`

MCQ 3

3. Choose the code used to print the following:

```
                              "Friends"
```

(A) `System.out.print(""Friends"");`

(B) `System.out.print("//"Friends//"");`

(C) `System.out.print("/"Friends/"");`

(D) `System.out.print("\"Friends\"");`

(E) `System.out.print("\\"Friends \\"");`

FRQ

1. This question simulates birds or possibly a bear eating at a bird feeder. The following `Feeder` class contains information about how much food is in the bird feeder and simulates how much food is eaten. You will write two methods of the `Feeder` class.

```
public class Feeder
{
    /**
     *   The amount of food, in grams, currently in the bird feeder; initialized in the constructor and
     *   always greater than or equal to zero
     */
    private int currentFood;

    /**
     *   Simulates one day with numBirds birds or possibly a bear at the bird feeder,
     *   as described in part (a)
     *   Precondition: numBirds > 0
     */
    public void simulateOneDay(int numBirds)
    {   /* to be implemented in part (a) */   }

    /**
     *   Returns the number of days birds or a bear found food to eat at the feeder in this simulation,
     *   as described in part (b)
     *   Preconditions: numBirds > 0, numDays > 0
     */
    public int simulateManyDays(int numBirds, int numDays)
    {   /* to be implemented in part (b) */   }

    // There may be instance variables, constructors, or methods that are not shown.
}
```

FRQ Answer

A Feeder class for simulation(1 var, 2 function)
public class Feeder
        private int currentFood
        public void simulateOneDay(int numBirds)
        public int simulateManyDays(int numBirds, int numDays)

Requirements
write function public void simulateOneDay(int numBirds)
no return only calculate and change private int currentFood
95% birds eats, 5% bear eats
each bird eats (10, 50] determine by each day
bear eat all

Points
example doesn't show the bear part and possibility, but need to implement
Math.random() < 0.05 test if bear come
(int) (Math.random() * 41 + 10) get each consum
[0, 1) * 41 = [0, 41)
[0, 41) + 10 = [10, 51)
(int)[10, 51) = only integer, range from [10, 50]

Logic
given birds
if 95%
        consum = random(10, 50]
        totalConsum = consum * birds
        currentFood = currentFood – totalConsum
        if currentFood < 0 then currentFood = 0
else
        currentFood = 0

```
(a)  public void simulateOneDay(int numBirds)
     {
         double condition = Math.random();
         if (condition < 0.05)
         {
             currentFood = 0;
         }
         else
         {
             int eachBirdEats = (int) (Math.random() * 41) + 10;
             int totalEaten = numBirds * eachBirdEats;
             if (totalEaten > currentFood)
             {
                 currentFood = 0;
             }
             else
             {
                 currentFood -= totalEaten;
             }
         }
     }
```
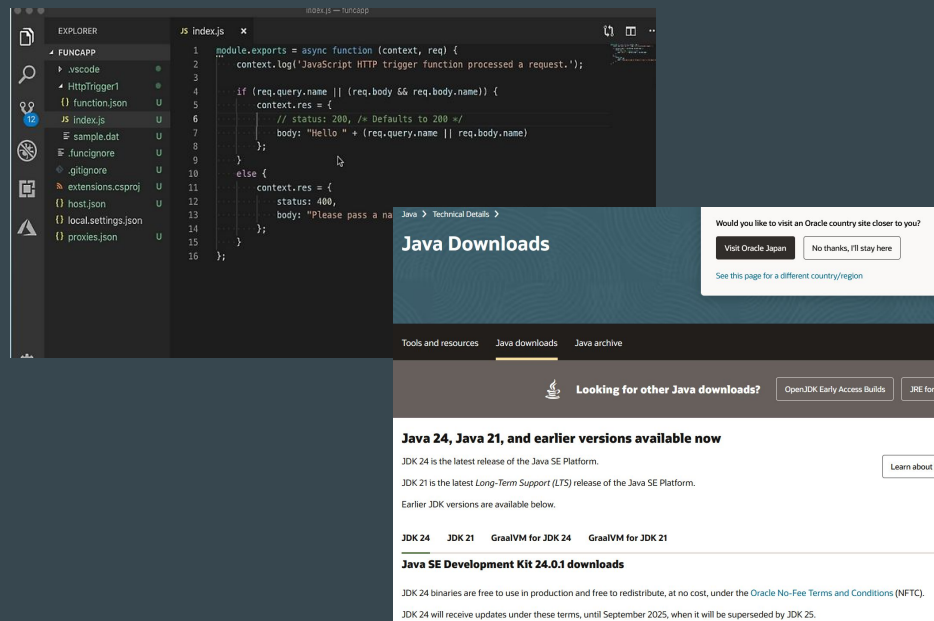
Practical Setup + Hands-on Coding

Why?

- Many students fail the FRQ because they're too afraid to try coding on their own.

- Practice makes the difference — we'll write code together, not just watch.

You need

- Windows (or MacOS)

- IDE (VSCode)

- Java SDK

or......

Or......

Hello World!

```java
public class Hello {
  public static void main(String[] args) {
    System.out.println("Hello, world!");
  }
}
```
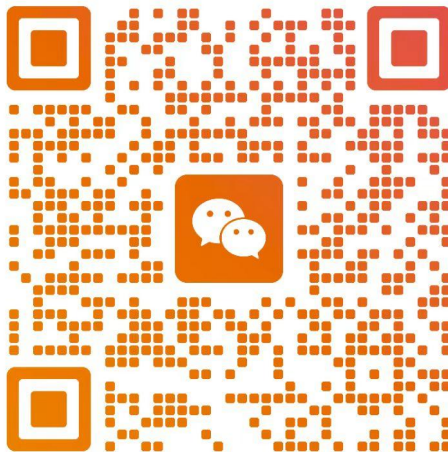
Thanks!

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网页前端Yunu

扫一扫上面的二维码图案，加我为朋友。