Revision

Object Orientated Programming in Java

Benjamin Kenwright

Outline

- Review Java Concepts and Principles
- Today’s Practical
- Review/Discussion

Revision Question

- Does the following code compile? If so what would the output be?

```
public class Question
{
    // Program Entry Point
    public static void main(String[] args)
    {
        int i = 6;
        i = i++ - --i;
        System.out.println("i: " + i);

    }
}// End class Question
```

Answer

- i: 0

Revision Question

- Does the following code compile? If so what would the output be?

```
public class Question
{
    // Program Entry Point
    public static void main(String[] args)
    {
        int i = 6;
        i = i-- - --i + ++i;
        System.out.println("i: " + i);

    }
}// End class Question
```

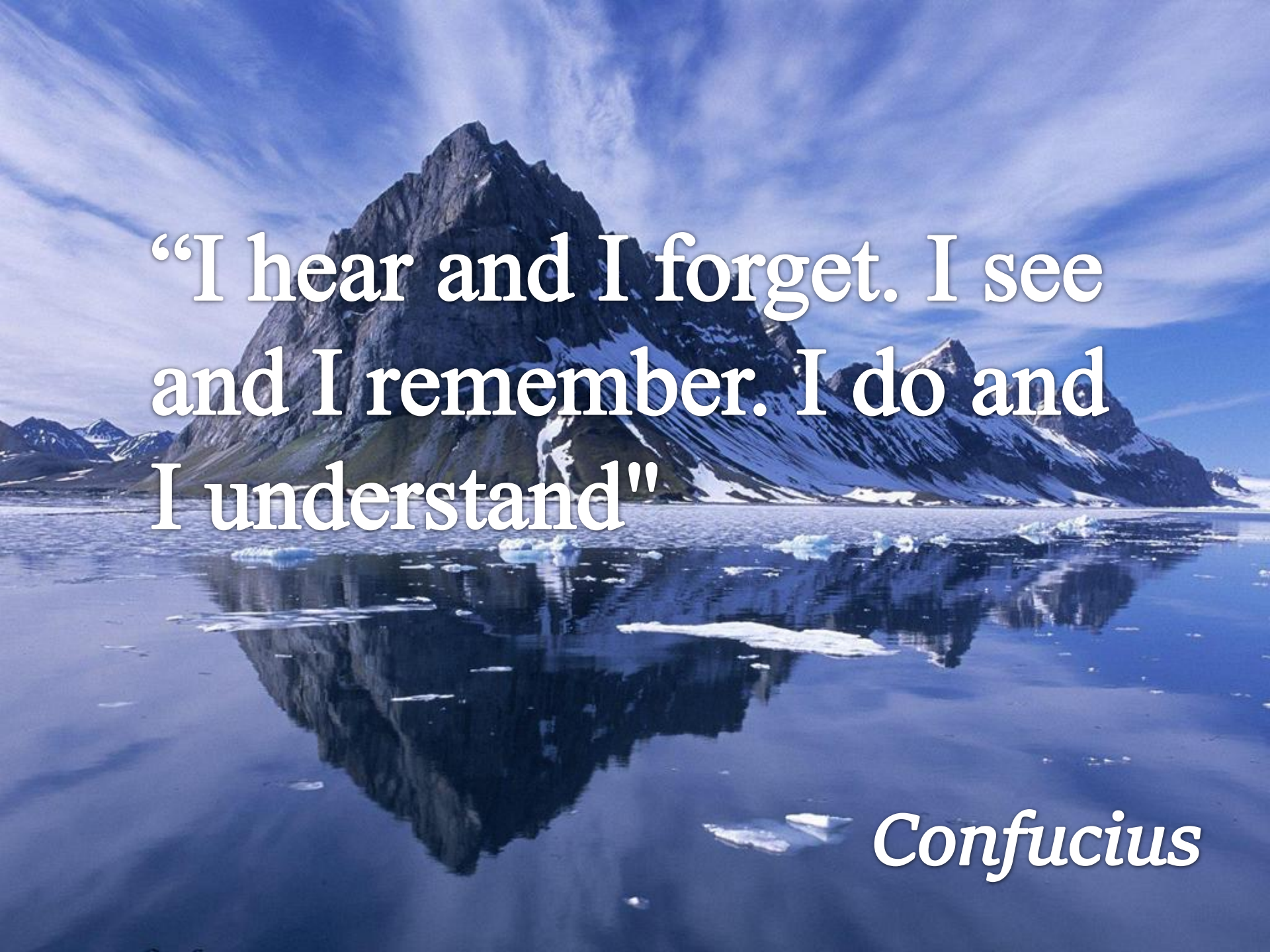
Answer

- i: 7

Question

- Who said:

“I hear and I forget. I see and I remember.
I do and I ***understand***'


“I hear and I forget. I see and I remember. I do and I understand"
Confucius

Work Through Problems

- Variety of open ended problems
  - Different difficulty (easy to hard)
- Use Java to solve them
- Creative and use your initiative

Project Euler

Project Euler is a series of **challenging** mathematical/computer *programming problems* that will require more than just mathematical insights to solve

Sharpening your Java programming skills

Euler Project

- https://projecteuler.net/

1. Register
2. Work through archive exercises
   (easy to hard)
3. As you complete each exercise it will log your achievement
   (also show you other peoples solutions)

Archived Problems - Proj

Secure | https://projecteuler.net/archives

Project Euler.net

About | Archives | Recent | News | Register | Sign In

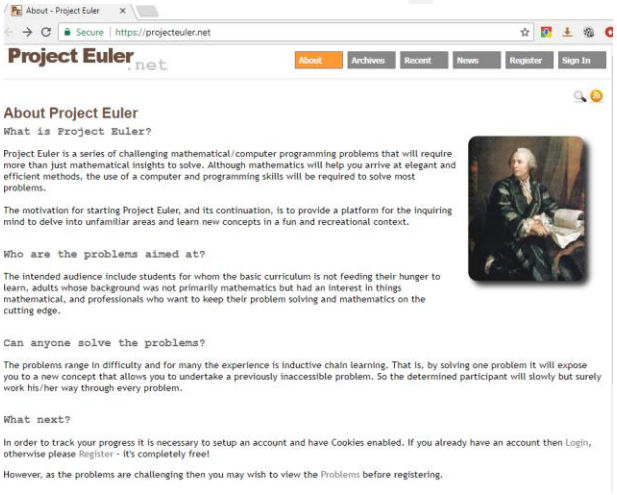
Cache update: 59 minutes

Problems Archives

The problems archives table shows problems 1 to 606. If you would like to tackle the 10 most recently published problems then go to Recent problems.
Click the description/title of the problem to view details and submit your answer.

1 2 3 4 5 6 7 8 9 10 11 ... 13 Go to Problem:

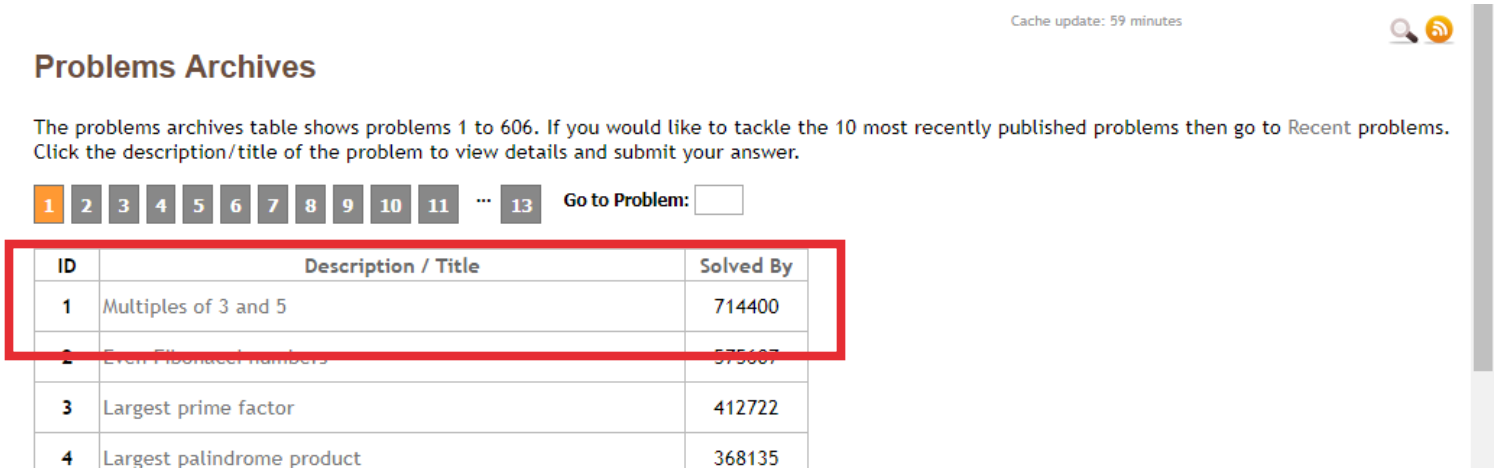
ID	Description / Title	Solved By
1	Multiples of 3 and 5	714400
2	Even Fibonacci numbers	575607
3	Largest prime factor	412722
4	Largest palindrome product	368135
5	Smallest multiple	377155
6	Sum square difference	379239
7	10001st prime	324815
8	Largest product in a series	275299
9	Special Pythagorean triplet	277535
10	Summation of primes	254805
11	Largest product in a grid	185313
12	Highly divisible triangular number	172744
13	Large sum	178547
14	Longest Collatz sequence	177861
15	Lattice paths	147135



https://projecteuler.net/

Example

- Exercise Multiples of 3 and 5



Cache update: 59 minutes

Problems Archives

The problems archives table shows problems 1 to 606. If you would like to tackle the 10 most recently published problems then go to Recent problems.
Click the description/title of the problem to view details and submit your answer.

1 2 3 4 5 6 7 8 9 10 11 ··· 13 Go to Problem:

ID	Description / Title	Solved By
1	Multiples of 3 and 5	714400
2	Even Fibonacci numbers	575607
3	Largest prime factor	412722
4	Largest palindrome product	368135

https://projecteuler.net/

Example

- Exercise Multiples of 3 and 5

- **Problem 1**
- If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23.
- Find the sum of all the multiples of 3 or 5 below 1000.

https://projecteuler.net/

Example

- Exercise Multiples of 3 and 5

- **Problem 1**
- If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23.
- Find the sum of all the multiples of 3 or 5 below 1000.

- How to solve this using Java?
- Write a simple Java program to calculate the answer

```java
/*
Exercise Multiples of 3 and 5
If we list all the natural numbers below 10 that are multiples
of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23
*/
public class Question
{    /*
     Solution
     */
     static void Multiple3and5(int upTo)
     {
          int count = 0;
          for (int i=0; i<upTo; ++i)
          {
               if ( i%3==0 || i%5==0 )
               {
                    count += i;
               }
          }
          System.out.println("Multiple of 3 and 5 upto " + upTo +
                             " is: " + count );
     }
     // Program Entry Point
     public static void main(String[] args)
     {
          // Test
          Multiple3and5(10); // Should give me 23
          //Problem
          Multiple3and5(1000); // Work out the answer
     }
}// End class Question
```

My Example Answer

Answer

- Output

Multiple of 3 and 5 upto 10 is: 23

Multiple of 3 and 5 upto 1000 is: **233168**

Submit your answer to https://projecteuler.net/. Only then will it allow you to continue to the next question (only if your answer is correct)

Summary

- Today writing Java programs to solve various problems (sharpen your abilities)
  - https://projecteuler.net/
- Allow you to review concepts/principles
  - e.g., look online/review slides/exercises, ..
- Hands-On/Practical

This Week

- Read Chapters
- Review Slides
- Exam 2nd January
  - Revising Regularly
  - Practicing/Reviewing Material

Questions/Discussion

- Let me know how many questions you complete in the **first 1 hour**

- **Optionally work as teams**