

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***”

A majestic, snow-capped mountain peak is reflected in a calm body of water. The water is dark blue, and several icebergs are floating on the surface. The sky is a deep blue with wispy white clouds. The overall scene is serene and majestic.

“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 x

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



About - Project Euler x

Secure | https://projecteuler.net

Project Euler.net

About Archives Recent News Register Sign In

About Project Euler

What is Project Euler?

Project Euler is a series of challenging mathematical/computer programming problems that will require more than just mathematical insights to solve. Although mathematics will help you arrive at elegant and efficient methods, the use of a computer and programming skills will be required to solve most problems.

The motivation for starting Project Euler, and its continuation, is to provide a platform for the inquiring mind to delve into unfamiliar areas and learn new concepts in a fun and recreational context.

Who are the problems aimed at?

The intended audience include students for whom the basic curriculum is not feeding their hunger to learn, adults whose background was not primarily mathematics but had an interest in things mathematical, and professionals who want to keep their problem solving and mathematics on the cutting edge.


Can anyone solve the problems?

The problems range in difficulty and for many the experience is inductive chain learning. That is, by solving one problem it will expose you to a new concept that allows you to undertake a previously inaccessible problem. So the determined participant will slowly but surely work his/her way through every problem.

What next?



In order to track your progress it is necessary to setup an account and have Cookies enabled. If you already have an account then Login, otherwise please Register - It's completely free!

However, as the problems are challenging then you may wish to view the Problems before registering.



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

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.

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

```

/*
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**