

First part: Java Basics

<https://github.com/TomNewbie/Java>



Group information

Group name: Don't know how to code

1. Phan Chi Tho

Matriculation numbers: 1403884

Presented problem: Welcome to code Jam

2. Ferid Gökkaya

Matriculation numbers: 1250370

3. Tran Hoang Kim

Matriculation numbers: 1403509



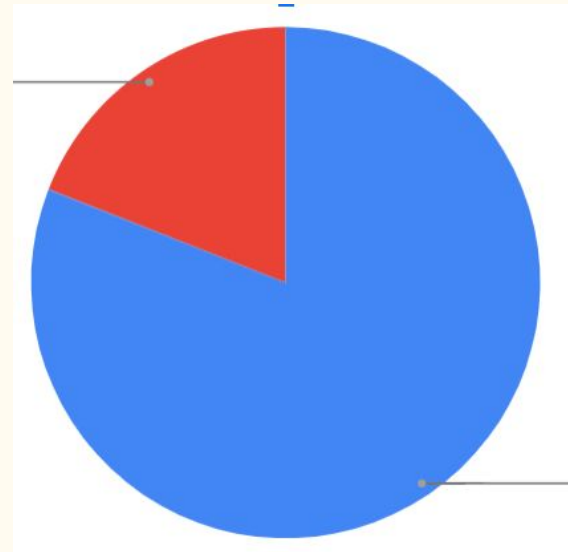
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1. Exercise sheet's result
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Week 1

Task	Solved percent
1	100%
2	100%
3	100%
4	100%
5	100%

Unsolved
(4)

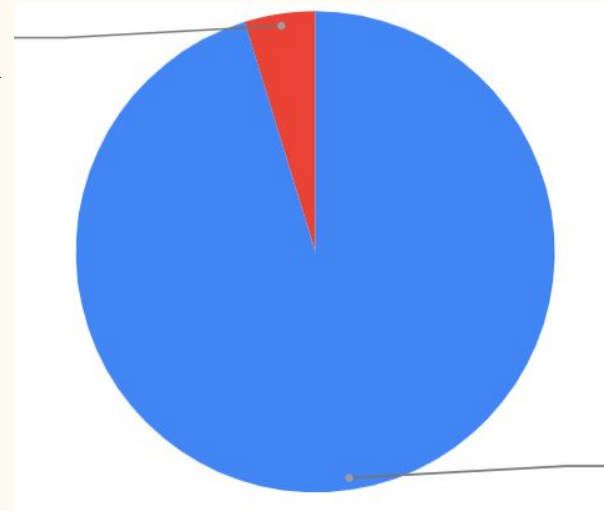


Solved
(17)

Week 2

Task	Solved percent
1	100%
2	100%
3	100%
4	100%

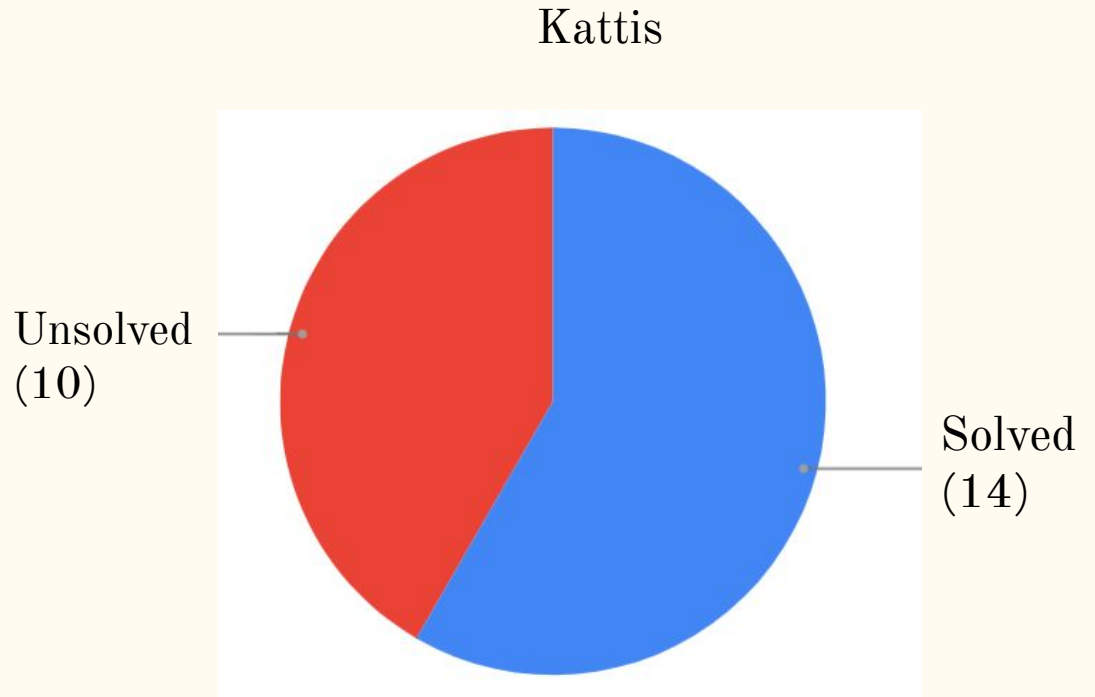
Unsolved
(1)



Solved
(20)

Week 3

Task	Solved percent
1	100%
2	100%
3	100%
4	100%
5	100%
6	100%



Week 4

Task	Solved percent
1	100%
2	100%
3	100%
4	100%
5	100%
6	100%

Kattis (Solved all)



Kattis Standing and Number of solved problems

Week 1

9	Don't know how to code	17	132458
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Week 2

8	Dont know how to code	20	86273
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Week 3

5	Dont know how to code	14	68937
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Week 4

4	Don't know how to code	21	117148
---	------------------------	----	--------

Katis Profile of each member



Tho Phan

tho.phanchi@stud.fra-uas.de

RANK

9995

SCORE

101.0



Germany



Trần Hoàng Kim

kim.tranhoang@stud.fra-uas.de

RANK

14194

SCORE

71.0



Germany



Ferid Gökkaya

ferid.gokkaya@aol.com

RANK

26276

SCORE

36.1



Germany

How we work as a team?

- 1 Online meeting per week
- Use github to share code and collect files
- Divide task equally and suitable for each member

How to survive Kattis?

- Know the language
(<https://docs.oracle.com/javase/tutorial/java/>)
- It is ok to look at solution
- Try to understand the code/ idea of the problem

Some Error That Frustrate You

Ladder

✖ Compile Error

Divisors

✖ Time Limit Exceeded

Smallest Multiple

✖ Wrong Answer

Divisors

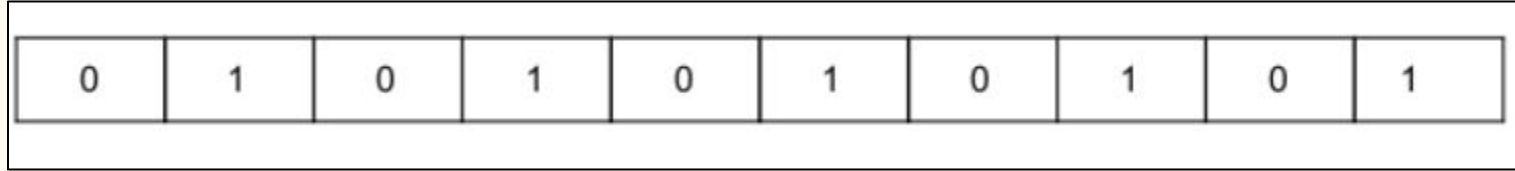
✖ Run-Time Error

Prime Sieve



Memory Limit Exceeded

Bitset Data Structure



- An array has value true and false, and each items only cost 1 bit
- Regular array of boolean, each cost 1 byte

⇒ 8 times smaller than regular array.

Reference: <https://docs.oracle.com/javase/7/docs/api/java/util/BitSet.html>

Prime Number Generator

```
public class prime {  
    public static boolean isPrime(int n) {  
        if (n <= 1)  
            return false;  
        for (int i = 2; i <= Math.sqrt(n); i++) {  
            if (n % i == 0)  
                return false;  
        }  
        return true;  
    }  
  
    public static void generatePrime(int n) {  
        for (int i = 2; i <= n; i++) {  
            if (isPrime(i)) {  
                System.out.println(i);  
            }  
        }  
    }  
}
```

- Too long and ineffective
- To find each prime cost $O(n)$
- Easy to get **Memory Limit Exceeded**

Prime Sieve (Sieve of Eratosthenes)

	2	3	4	5	6	7	8	9	10	Prime numbers
11	12	13	14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	
31	32	33	34	35	36	37	38	39	40	
41	42	43	44	45	46	47	48	49	50	
51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	
71	72	73	74	75	76	77	78	79	80	
81	82	83	84	85	86	87	88	89	90	
91	92	93	94	95	96	97	98	99	100	
101	102	103	104	105	106	107	108	109	110	
111	112	113	114	115	116	117	118	119	120	

```
int n = scan.nextInt();
int numPrime = n - 1;
arrPrime = new BitSet();
arrPrime.set(fromIndex: 1, n, value: true);
for (int i = 2; i <= Math.sqrt(n); i++) {
    if (arrPrime.get(i - 1)) {
        for (int j = i * i; j <= n; j += i) {
            if (arrPrime.get(j - 1)) {
                numPrime--;
            }
            arrPrime.set(j - 1, value: false);
        }
    }
}
```

Java vs C/C++

- Very important and useful features
 - Collections: Hash Map, ArrayList, ..
- Some things are easier than in C/C++
 - Java has garbage collector, not mess up with memory like C/C++

Why using eclipse?

- Eclipse is for free
- Easy to use
- Very common at students
- Well developed
- Recommendable



Problem: Is It Halloween

Input

The input consists of a single line containing a date of the format FEB 9, with the month and date separated by a single space.

Output

If the date is October 31 or December 25, output yup. Otherwise, output nope.

Right way: Use equals() method

Wrong way: Almost people use “==” to check the month

```
1  import java.util.Scanner;
2
3  public class IsItHalloween {
4      Run | Debug
5      public static void main(String[] args) {
6          Scanner sc = new Scanner(System.in);
7          String month = sc.next();
8          int day = sc.nextInt();
9
10         if((month == "OCT") && day == 31 || (month == "DEC") && day == 25) {
11             System.out.println(x: "yup");
12         } else {
13             System.out.println(x: "nope");
14         }
15     }
```

```
1  import java.util.Scanner;
2
3  public class IsItHalloween {
4      Run | Debug
5      public static void main(String[] args) {
6          Scanner sc = new Scanner(System.in);
7          String month = sc.next();
8          int day = sc.nextInt();
9
10         if((month.equals(anObject: "OCT") && day == 31) || (month.equals(anObject: "DEC") && day == 25)) {
11             System.out.println(x: "yup");
12         } else {
13             System.out.println(x: "nope");
14         }
15     }
```

Quiz task

Week 2:

1. In Java, an object is created from:
A. a class
B. a constructor
C. a name
D. a subclass
2. What are the parameters?
A. Variables in a method or block of code
B. Member variables in a class
C. Variables in method declarations
D. Member variables in a subclass
3. Which components can class declarations include? (choose more than 1 answer)
A. Modifiers such as public, private, and a number of others that you will encounter later.
B. The class name, with the initial letter capitalized by convention.
C. The name of the class's parent (superclass), if any, preceded by the keyword extends. A class can extend (subclass) parents.
D. A comma-separated list of interfaces implemented by the class, if any, preceded by the keyword implements. A class can implement more than one interface.
E. The class body, surrounded by braces, {}
4. Reorder three components that Field declarations are composed:
a. The field's name.
b. Zero or more modifiers, such as public or private.
c. The field's type.
A. a,b,c
B. b,c,a
C. c,b,a
D. a,c,b

Week 3:

1. It is said that an interface declaration can contain method signatures, default methods, static methods and constant definitions.
A. True
B. False
2. What methods does the interface body contain?
A. Abstract methods, default methods
B. Abstract methods, default methods and static methods
C. Default methods and static methods
D. Abstract methods and static methods
3. Choose the right answers below:
A. A class that is derived from another class is called a subclass (also a derived class, extended class, or child class).
B. A superclass inherits all the members (fields, methods, and nested classes) from its subclass.
C. The class from which the subclass is derived is called a superclass (also a base class or a parent class).
D. Constructors are members, so they are inherited by subclasses
E. Classes can be derived from classes that are derived from classes
4. Fill in the blanks:
An instance method in a subclass with the signature (name, plus the number and the type of its parameters) and return type as an method in the superclass overrides the superclass's method.
A. unique - new
B. different - instance
C. special - new
D. same - instance
5. It is said that inherited instance methods from classes can override abstract interface methods.
A. True
B. False

- Learn more ways to create the quiz
- Select impressive knowledge in lots of information
- Remember more knowledge



THANK YOU

**FOR LISTENING TO MY
PRESENTATION**