Get Smart: With Java Programming

Yaman Omar Alashqar

```
System.out.println("WELCOME TO THIS COURSE\n");
```

Programming Errors
MOD (Reminder)
More Conditions
Scope of a variable

Chat-Bot
Students Fees Calculator

Programming Errors

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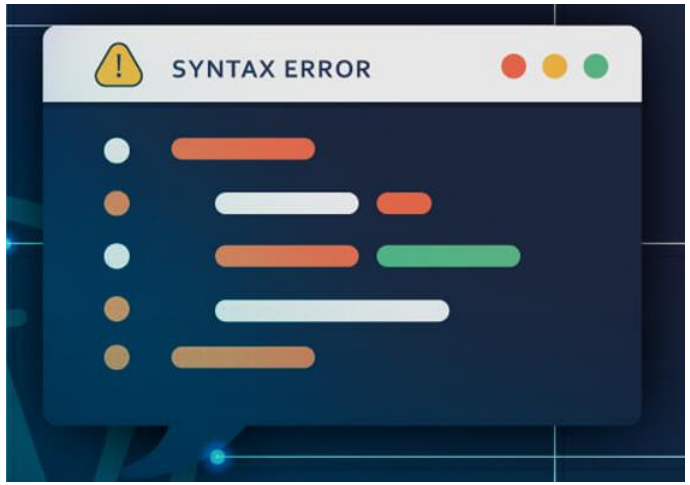
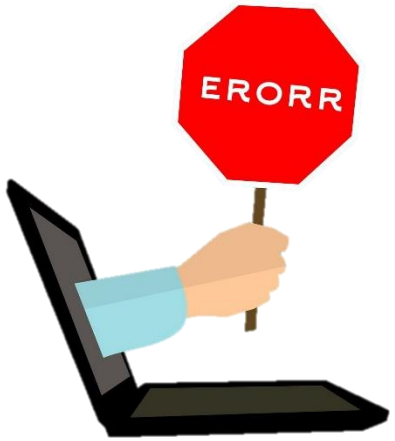
Scope of a variable

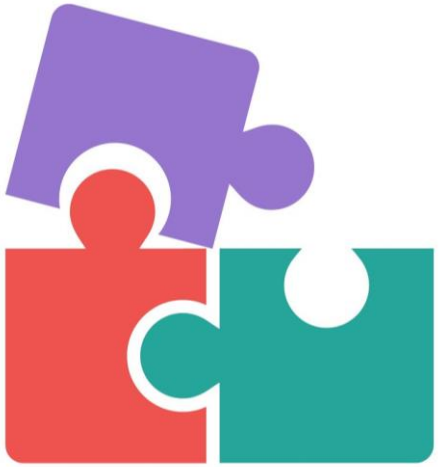
Programming Errors

Exception in thread "main" java.util.InputMismatchException

Syntax Error	Runtime Error	Logical Error
Using a variable that is not declared, misspelled a variable name, misspelled a method's name, forgetting a semi-colon	Dividing by zero, referencing missing files, not handling input correctly (if the user inputs a data of string when the program is expecting an integer)	returning an incorrect result, accidentally adding two variables instead of dividing them, wrong code sequence







```
int password = 222;
if(password == 123); {
System.out.println("-3 IS A NEGATIVE NUMBER"); }
```

Quick Revision & More Examples



The control statements are categorized in two groups:

- Selection control statements
- Repetition control statements

What will the output of this program be?

```
boolean passport = false;
boolean birthCertificate = true;
boolean driversLicense = true;
```

```
if (passport) {
    System.out.println("A passport is a valid ID.");
} else if (birthCertificate) {
    System.out.println("A birth certificate is a valid ID.");
} else if (driversLicense) {
    System.out.println("A driver's license is a valid ID.");
} else {
    System.out.println("Invalid ID. Your application is denied.");
}
```

true

This program will print out:

Assume you have access to an integer variable called dayOfTheWeek (use the key below in grey) and a boolean variable called isHoliday, which is true when it is a holiday and false on normal days.

Write Java code that prints "Wake up at 5:00AM" and sets the alarm to true on weekdays that are not holidays, and prints "Sleep!" and sets the alarm to false on weekends and holidays.

On Friday the program should remind the user that they have a "Java Class @11:PM" but without changing the alarm's state.

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday


```
Calendar calendar = Calendar.getInstance();
int dayOfTheWeek = calendar.get(Calendar.DAY_OF_WEEK);
//or => = Calendar.getInstance().get(Calendar.DAY_OF_WEEK);
```

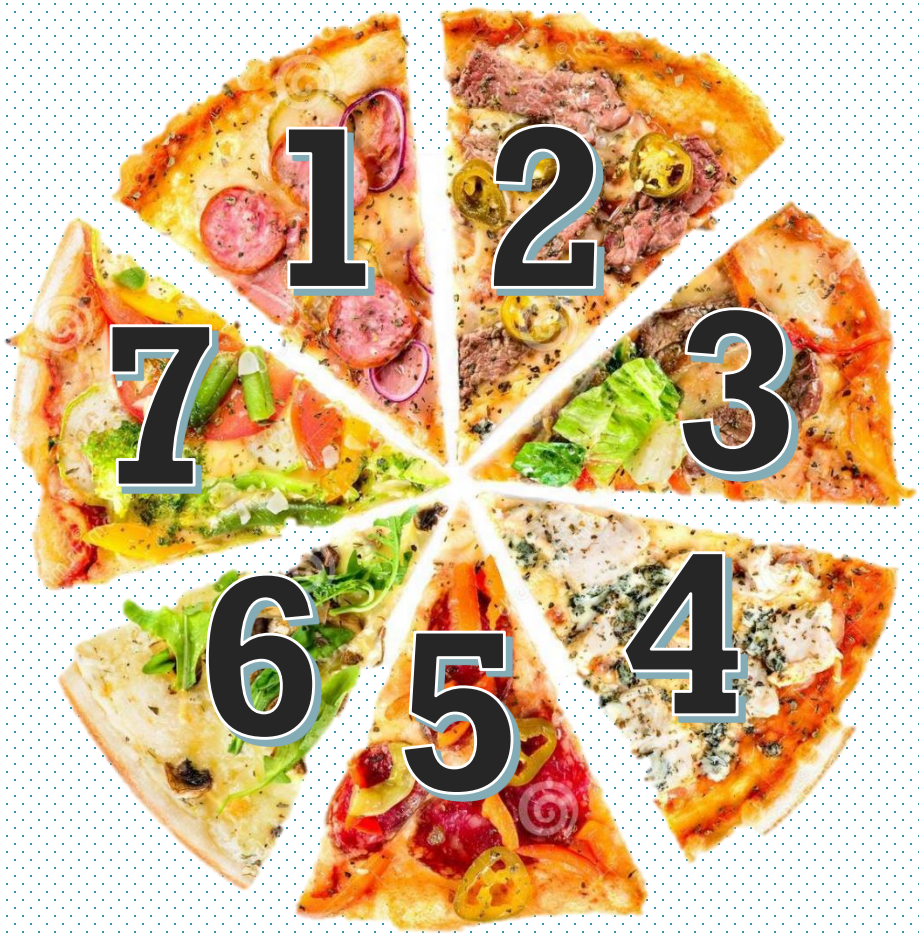
Errors In Java

MOD (Reminder)

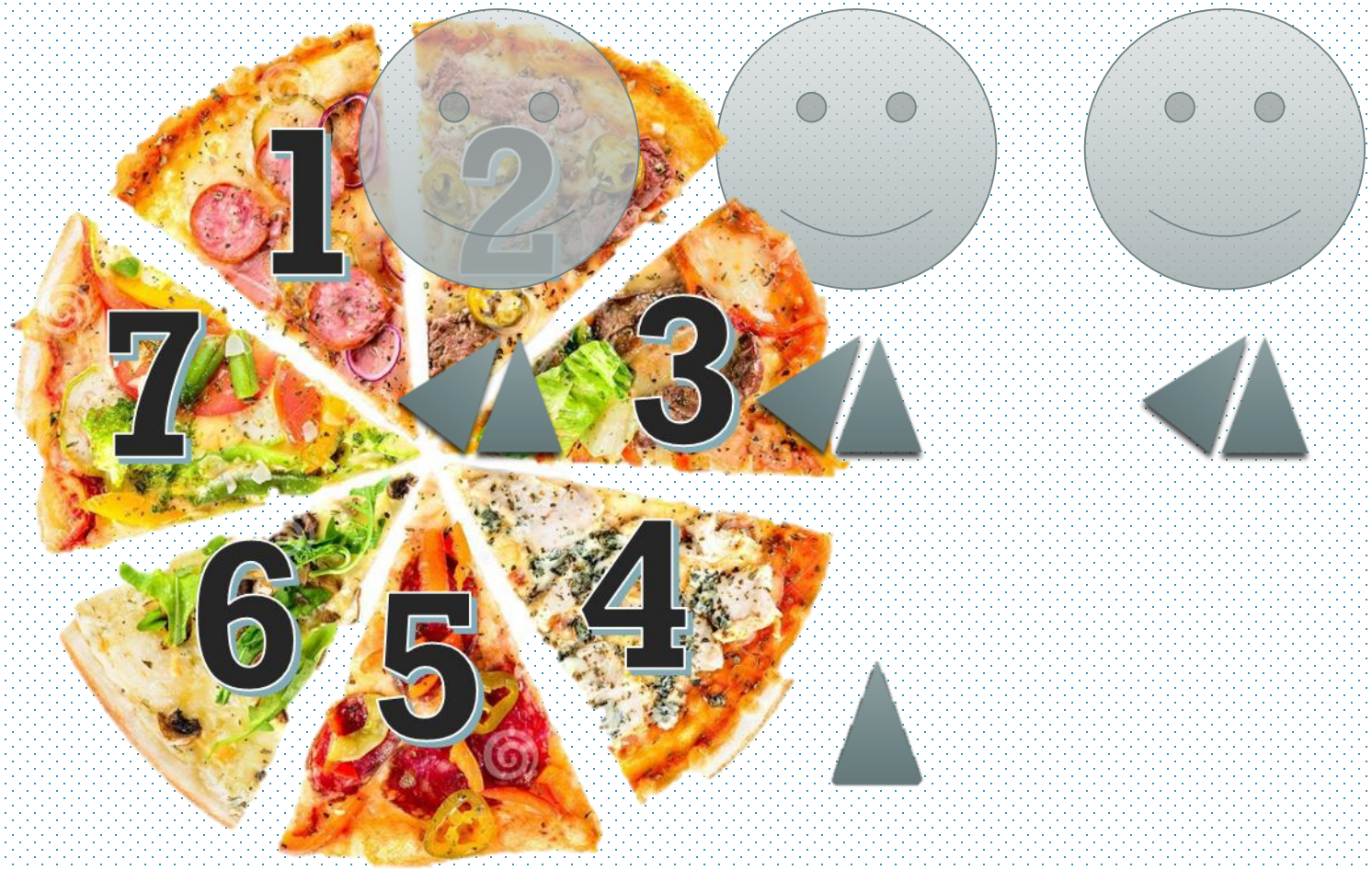
More Conditions

Scope of a variable

Modulus Operator



Modulus Operator



$$7\%3 = 1$$

```java
System.out.println(7 / 3);
System.out.println(7 % 3);
System.out.println(7 / 3.0);
System.out.println(7.0 / 3);
System.out.println((double)7 / 3);
System.out.println((double)(7 / 3));
```

```
2
1
2.3333333333333335
2.3333333333333335
2.3333333333333335
2.0
```

Modulus Operator

Modulus Operator %

quotient

$$3$$

divisor $2\overline{)\ 7}$ dividend

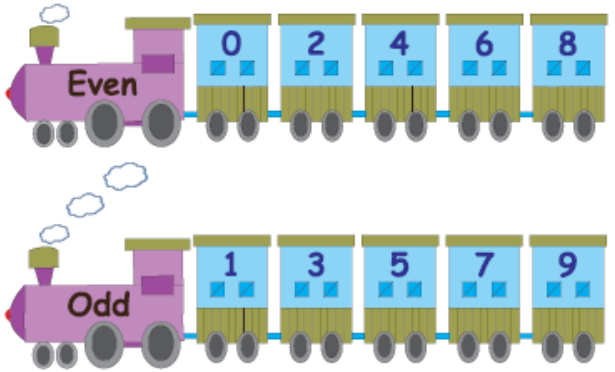
$$-\ 6$$

$$1 \text{ remainder}$$

CHECK IF THE NUMBER IS EVEN/ODD

An even number is a multiple of two.

Any multiple of two leaves a remainder of zero when divided by 2




```
if( num % 2 == 0 ) (“Even”);
    else (“Odd”);
```

The reminder is either 0 (Even) or 1 (Odd)

CHECK IF THE NUMBER IS EVEN/ODD

EXAMPLES

33%2 = 1 (ODD)

44%2 = 0 (EVEN)

ODD & EVEN

To check if a number is odd or even,
we check if the number is divisible by 2,
if yes then it is even, if no then it is odd

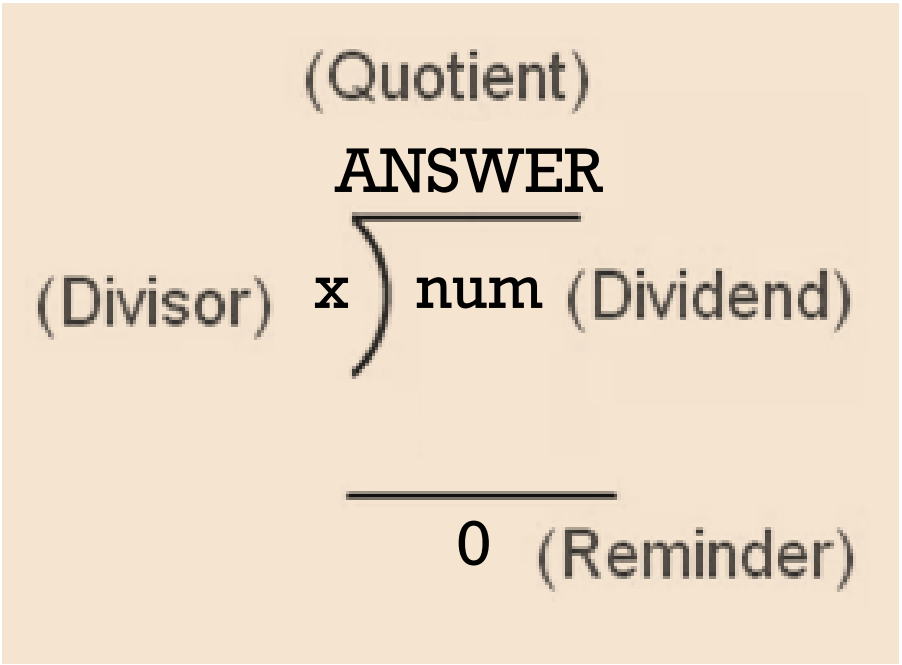
if (num % 2 == 0) → 'NUM' is even

An even number is a multiple of two.

DIVISBLE BY X

To check if a number is divisible by another number
we check if the number is divisible by X,
if yes then it is divisible, if no then it is not

if (num % X == 0) → 'NUM' is divisible by X



أوّضح وزير الدولة لشؤون الإعلام أمجد العضايلة، أنّ الترميز المستخدم للمركبات هو لآخر رقم من نمرة المركبة، وذلك في رده على أحد المواطنين عبر حسابه على "تويتر".

وكانت الحكومة سمحت ابتداءً من يوم الأربعاء باستخدام المركبات الخاصة على نظام الفردي والزوجي.

واشترطت الحكومة أن لا يزيد عدد المتواجدين في المركبة عن شخصين.

SEPERATING DIGITS

LAST DIGIT FROM THE RIGHT = **num % 10;**
CHOPPING OFF THE LAST DIGIT = **num / 10;**

int num = 5482;

5482

int last_digit = num%10;

2

num = num/10;

548.2

Because 'num' is an int, the decimal is ignored

Note:

```
d1 = (num/1000);          //5
d2 = (num/100) % 10;      //4
d3 = (num/10) % 10;       //8
d4 = (num) % 10;          //2
```

❖ Separating Digits

Suppose we have the following number ‘5732’ held in the variable ‘num’ and we want to separate each digit or even reverse the whole number…
A simple technique is used,

LAST DIGIT FROM THE RIGHT = **num % 10;**
CHOPPING OFF THE LAST DIGIT = **num / 10;**

5732 % 10 = 2
5732 / 10 = 573

Use this trick ~~in a loop → while(num>0) …~~
To find out:

- The number of digits or occurrence of a specific digit
- Sum of digits or The Product of digits
- Largest digit or the Minimum digit
- Reverse a number

A program that outputs ***the best*** number and ***the worst*** number.
The best number is the number with the ***largest last digit***
The worst number is the number with the ***smallest last digit.***

For example:

12**3** is better than 12**2**

9 is better than 1**0**

7**7** is better than 8**6**.

Note : A negative number is not allowed

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Variables Scope

The block of code where a variable can be used (between curly brackets)

```
public static void main(String[] args) {
boolean isLightGreen = true;
        if(isLightGreen) {
            int setSpeed = 40;
            System.out.println("DRIVE");
            System.out.println("setSpeed = " + setSpeed);
        }
             System.out.println("setSpeed = " + setSpeed ); }
```

```
public static void main(String[] args) {
 int setSpeed=0;
        boolean isLightGreen = true;
        if(isLightGreen) {
            setSpeed = 40;
            System.out.println("DRIVE");
            System.out.println("setSpeed = " + setSpeed);
        }
             System.out.println("setSpeed = " + setSpeed); }
```

Structure / Method	What it does	When to use // e.g. // Keywords
Selection Statements (Conditions) - if, - if .. else, - if … else if .. else	Choose which set of instructions are obeyed according to a condition	The question will contain a condition or an "if" keyword, or "between x and y" or "Include/Exclude" or "number of XXX" or "multiple cases" or "check if.." or "number relations" >, <, <=, >=, ==, !=
Iteration Statements (Loops) - while - for	Execute a group of statements multiple times, the statements keep looping (repeating) until the condition is false	e.g. 50 students, Multiple grades, read information for 50 departments, * Multiple (repetition) input /output/ statements * Repetition of numbers: e.g. factorial, prime, Fibonacci (or any series) * Digits (sum of digits, max, even digits etc..) * Counting Conditions