### Working with Formatting Dates and Time Zones



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#### Module Overview



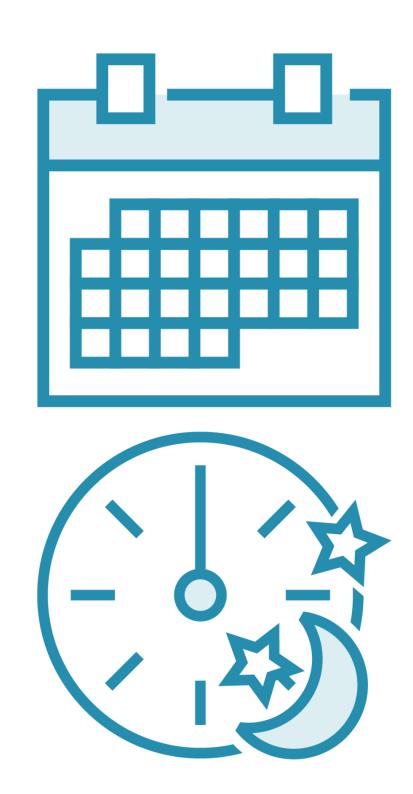
Why to format date and time?

Date-time localization and formatting

Time zone formatting

Timestamp formatting

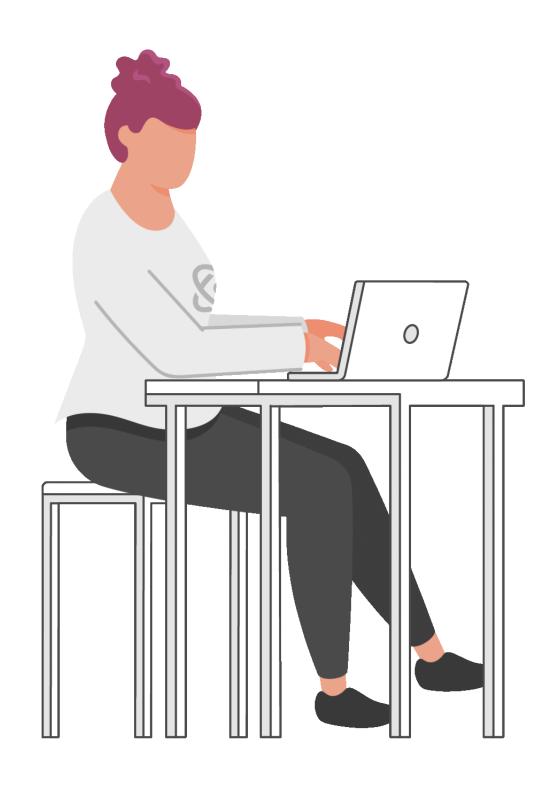
#### Why to Format Date, Timestamp and Time Zone?



Approx. 24 time zones in the world

Locale specific date, time and time zone

Locale specific date and time format



Requirement to support locale date, time and time zone

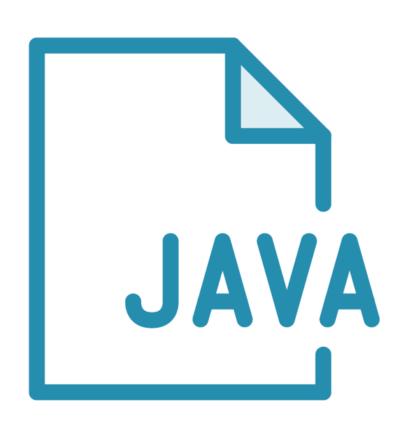
Display date and time in the locale supported format

Java classes that can help format local Date and time?



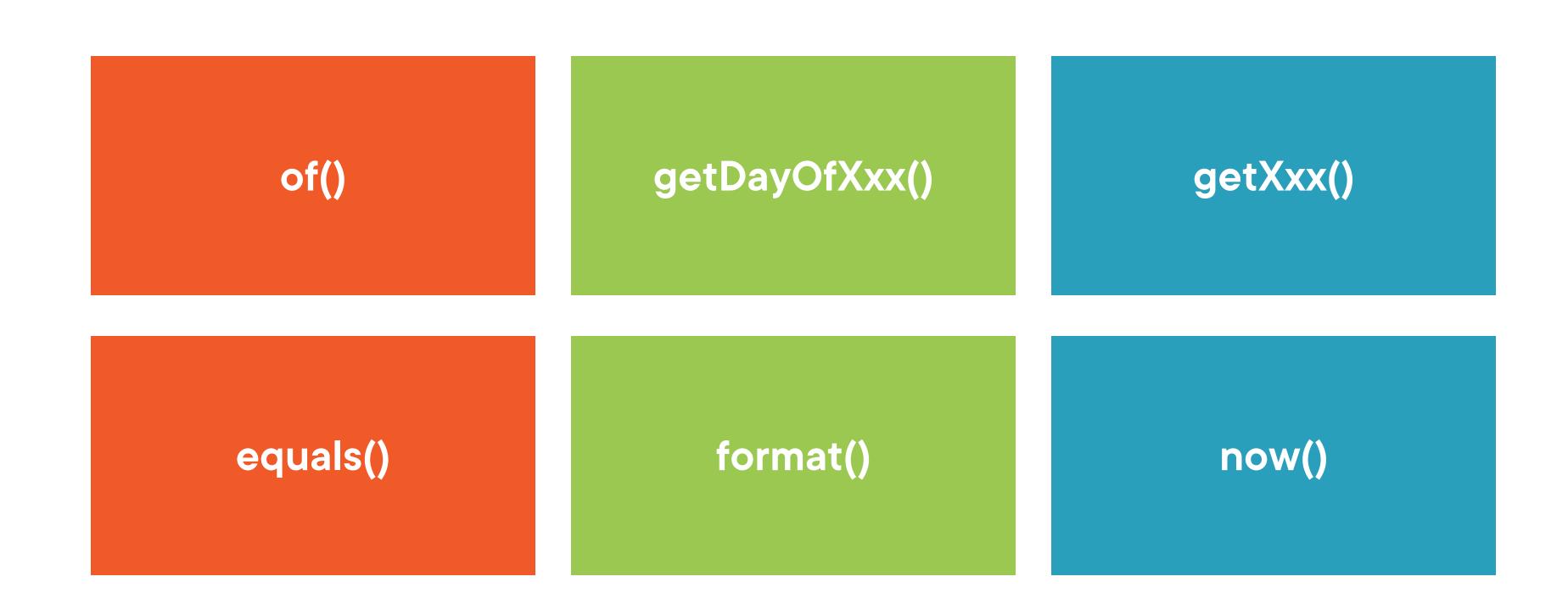
## LocalDateTime Class LocalTime Class DateTimeFormatter Class

#### LocalDateTime Class



Represents a date and time
day-of-year, day-of-week and week-of-year
Doesn't represent a time zone
java.time.LocalDateTime

#### LocalDateTime Class Methods



#### LocalTime Class



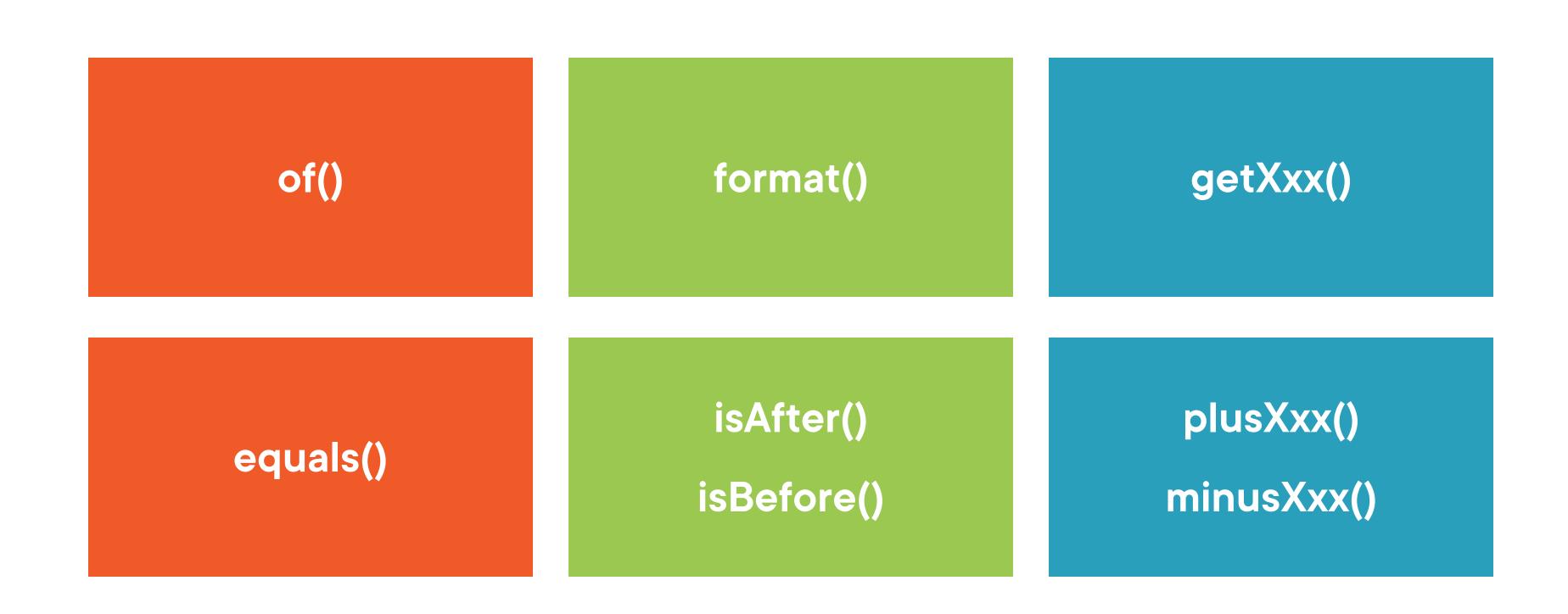
Represents a time

hour-minute-second

Doesn't store date and time zone

ISO-8601

#### LocalTime Class Methods



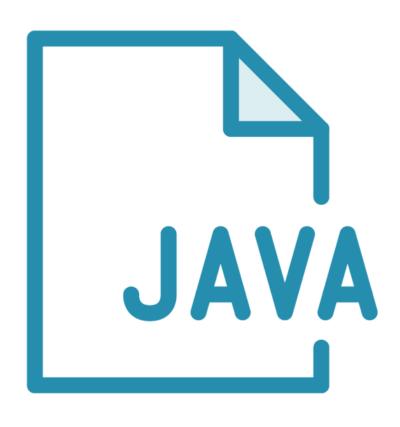
```
DayOfMonth - 7
import java.time.LocalDateTime;
public class DateTimeDemo {
                                               Month - MARCH
    public static void main(String args[]) {
        LocalDateTime localDateTime = LocalDateTime.of(2021,3,7,12,44,36);
        System.out.println("DayOfMonth - " + localDateTime.getDayOfMonth());
        System.out.println("Month - " + localDateTime.getMonth());
```

```
DayOfMonth - 1
import java.time.LocalDateTime;
public class DateTimeDemo {
                                               Month - MARCH
   public static void main(String args[]) {
        LocalDateTime localDateTime = LocalDateTime.now();
        System.out.println("DayOfMonth - " + localDateTime.getDayOfMonth());
        System.out.println("Month - " + localDateTime.getMonth());
```

```
import java.time.LocalDateTime;
import java.time.LocalTime;
                                                Hour - 12
                                                Minute - 44
public class DateTimeDemo {
    public static void main(String args[]) {
        LocalDateTime localDateTime = LocalDateTime.of(2021,3,7,12,44,36);
        LocalTime localTime = localDateTime.toLocalTime();
        System.out.println("Hour - " + localTime.getHour());
        System.out.println("Minute - " + localTime.getMinute());
```

```
import java.time.LocalDateTime;
import java.time.LocalTime;
                                                Hour - 10
                                                Minute - 23
public class DateTimeDemo {
    public static void main(String args[]) {
        LocalDateTime localDateTime = LocalDateTime.now();
        LocalTime localTime = localDateTime.toLocalTime();
        System.out.println("Hour - " + localTime.getHour());
        System.out.println("Minute - " + localTime.getMinute());
```

#### DateTimeFormatter Class



#### Printing and parsing date-time objects using

- Predefined constants (e.g. ISO\_LOCAL\_DATE)
- Pattern letters (e.g. yyyy-MMM-dd)
- Localized styles (e.g. long, medium)

DateTimeFormatterBuilder for more complex formatting

#### DateTimeFormatter Class Methods

ofPattern() ofLocalizedXxx() getXxx() withLocale() localizedBy() withZone()

#### Formatting Date and Time

```
Default Format Date Time - 09-March-2021
                                                  12:44:36.000
public class DateTimeDemo {
    public static void main(String args[]) {
        LocalDateTime localDateTime = LocalDateTime.now();
        String pattern = "dd-MMMM-yyyy HH:mm:ss.SSS";
        DateTimeFormatter dateTimeFormatter = DateTimeFormatter.ofPattern(pattern);
        String formatDateTime = localDateTime.format(dateTimeFormatter);
        System.out.println("Default Format Date Time - " + formatDateTime);
```

Java classes that can help format time zone and time stamp?



# TimeZone Class ZonedDateTime Class TimeStamp Class

#### TimeZone Class

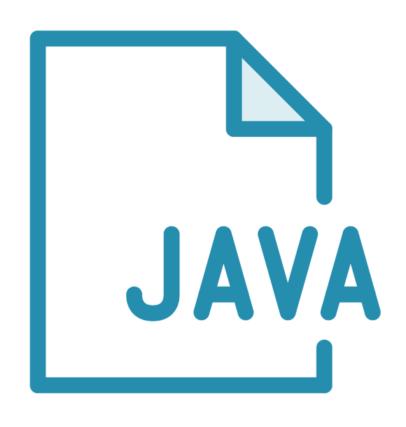


Represents a time-zone offset
getDefault() and getTimeZone()
Zone IDs (e.g. "America/Los\_Angeles")

#### TimeZone Class Methods

getDisplayName() setDefault() toZoneld() inDayLightTime() useDaylightTime() setID()

#### ZonedDateTime Class

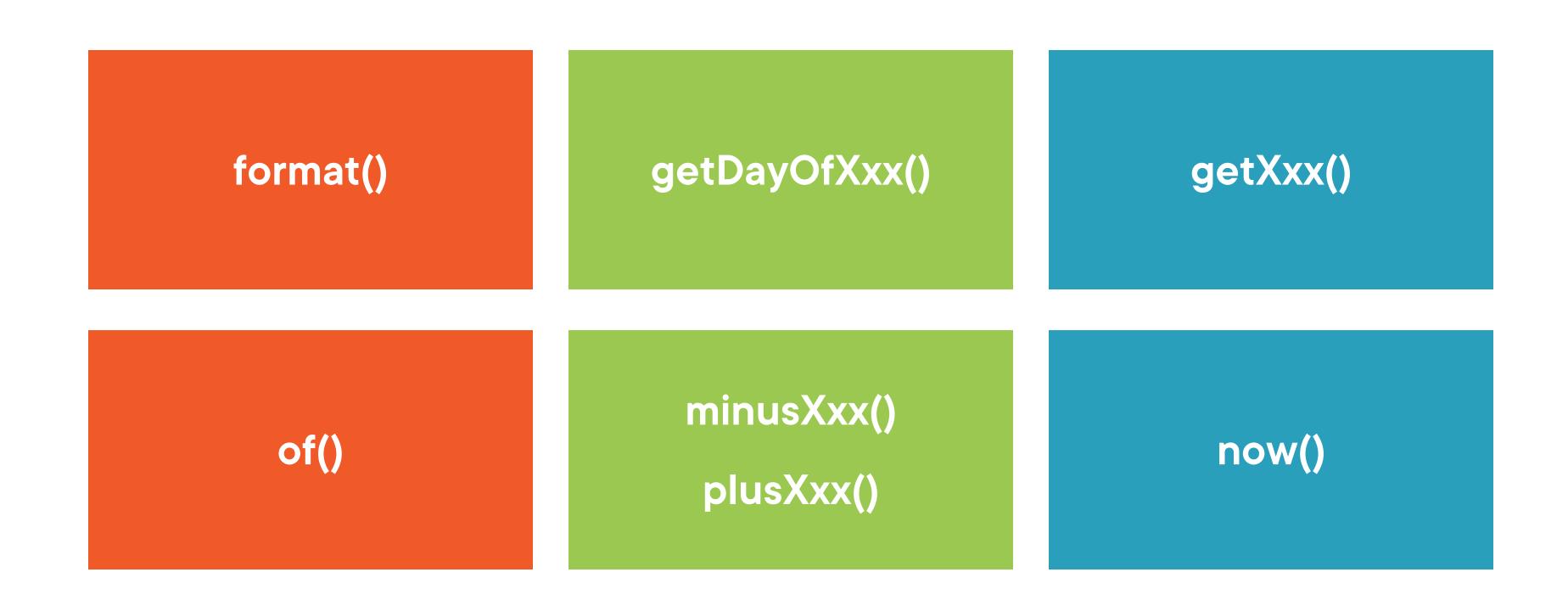


Represents a date-time with time-zone

2021-09-03T12:44:30+01:00 Europe/Paris

Supports time-line conversion

#### ZonedDateTime Class Methods



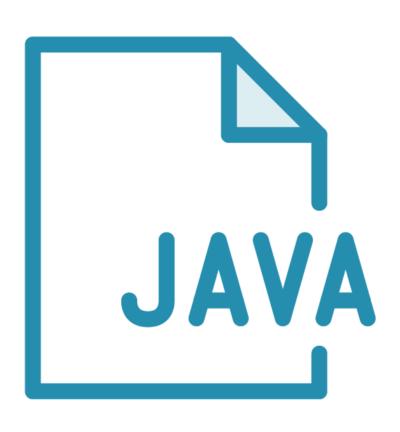
#### Dealing with Time Zones

```
public class TimeZoneDemo {
                                                  TimeZone - Indische Zeit
    public static void main(String args[]) {
        Locale.setDefault(Locale.GERMANY);
        TimeZone localTimeZone = TimeZone.getDefault();
        System.out.println("TimeZone - " +
localTimeZone.getDisplayName(Locale.getDefault()));
```

#### Dealing with ZonedDateTime

```
ZonedDateTime - 2021-03-
                                                  11T08:04:31.547795800+09:00[Asia/Tokyo]
public class TimeZoneDemo {
                                                  DayOfMonth - 11
    public static void main(String args[]) {
        ZonedDateTime zonedDateTime = ZonedDateTime.now(ZoneId.of("Asia/Tokyo"));
        System.out.println("ZonedDateTime - " + zonedDateTime.toString());
        System.out.println("DayOfMonth - " + zonedDateTime.toLocalDateTime().
getDayOfMonth());
```

#### Timestamp Class



Wrapper around java.util.Date

Interpreted as SQL TIMESTAMP by JDBC API

Precision of 19-21 characters

yyyy-mm-dd hh:mm:ss

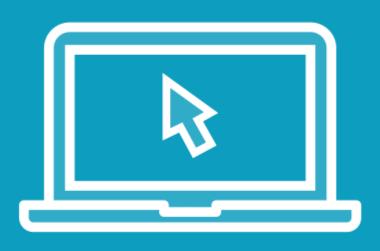
#### Timestamp Class Methods



#### Dealing with Timestamp

```
Timestamp - 2021-03-07 12:44:36.0
public class TimestampDemo {
    public static void main(String args[]) {
        LocalDateTime localDateTime = LocalDateTime.now();
        Timestamp timestamp = Timestamp.valueOf(localDateTime);
        System.out.println("Timestamp - " + timestamp.toString());
```

#### Demo

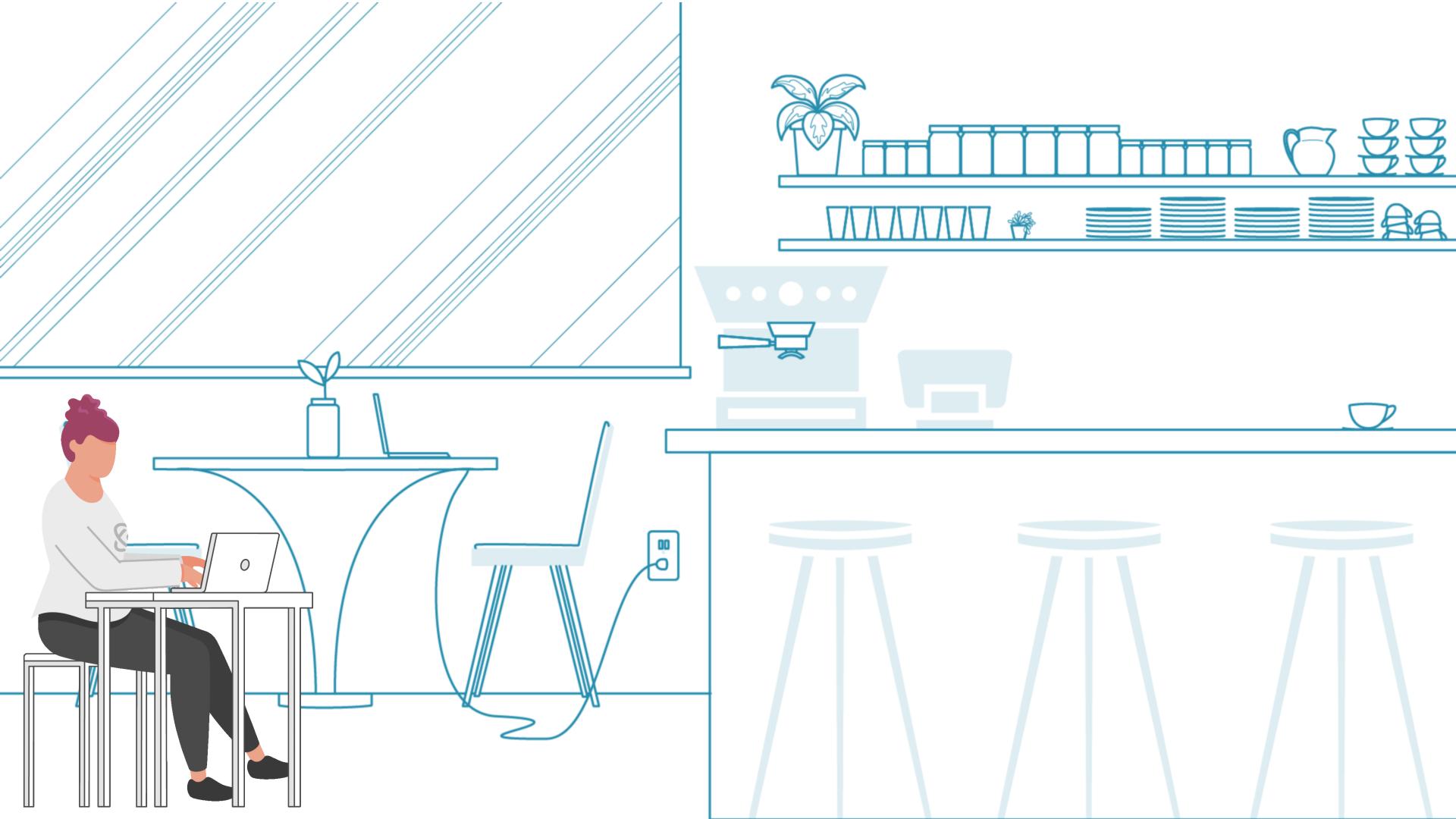


Obtaining local date and time

Formatting date and time based on locale

Adding time-zone field along with date and time

**Dealing with timestamps** 



#### Module Summary



### Motivation behind Date, time and time zone formatting

LocalDateTime class

LocalTime class

**DateTimeFormatter class** 

TimeZone class

**ZonedDateTime class** 

Timestamp class

Up Next:
Working with Formatting Numbers