# ZombieTime – JSR 310 for the Undead

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# We just want to fit in

https://www.flickr.com/photos/philippeleroyer/4071842319/

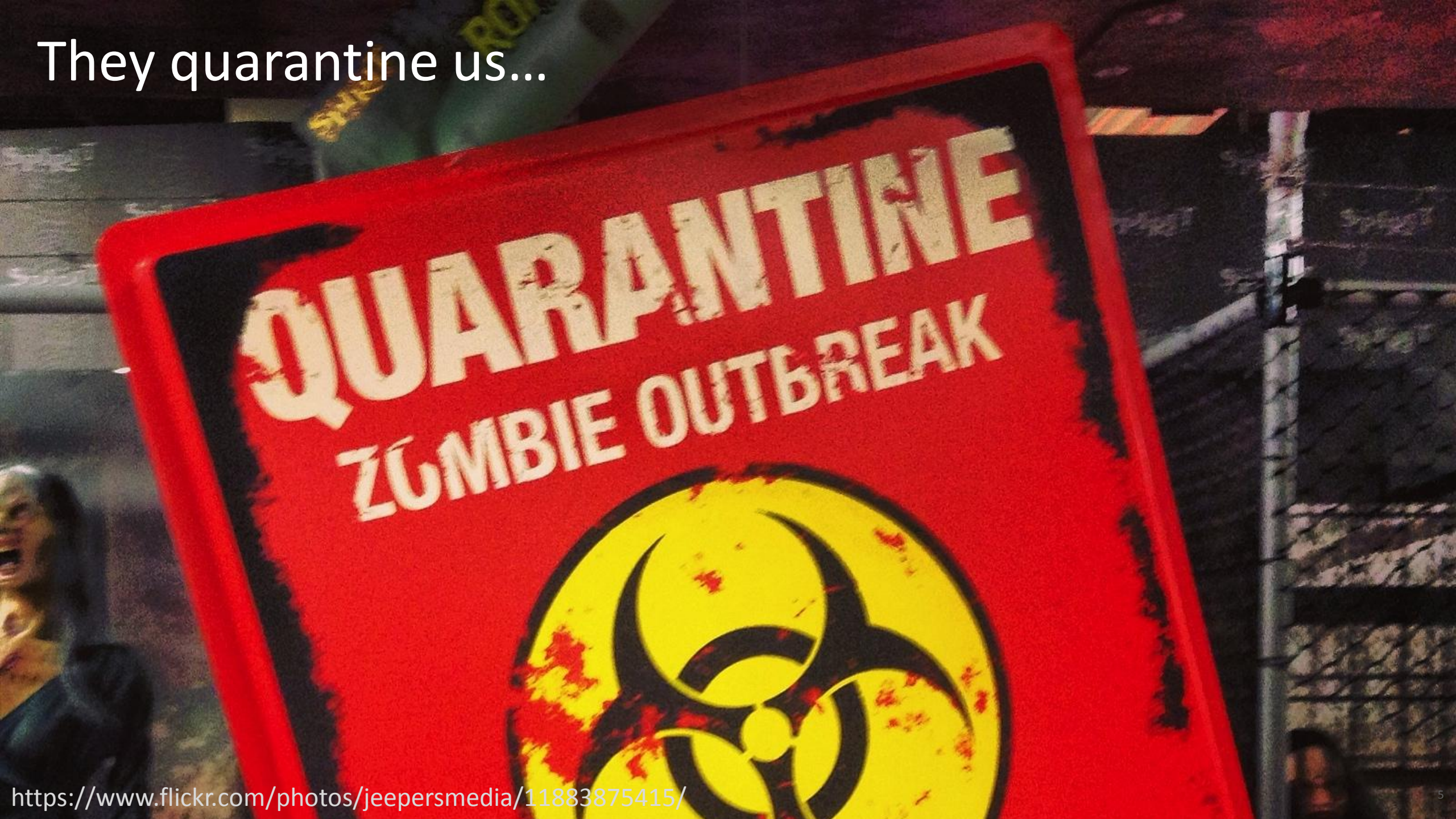
# But humans are scared of us!

https://www.flickr.com/photos/moira_fee/5632351014/

# Is it just because we eat brains?

https://www.flickr.com/photos/dwilliss/7861599590/

# They quarantine us…




https://www.flickr.com/photos/jeepersmedia/11883875415/

# And attack us with weapons…

https://www.flickr.com/photos/nichpics/10628256503/

# But when it is us vs. them…

https://www.flickr.com/photos/icedsoul/4511648609/in/photostream/

# Humans don't stand a chance!

https://www.flickr.com/photos/icedsoul/4470494133/

# JSR 310, a New Weapon Against the Humans!

- Our researchers have come up with a new weapon against the humans!
  - Modern API – Zombies type slow, so we need a fluent API with easy conversions
  - Thread safe – Don't get caught in a deadlock with armed humans!
  - Simplified Time Zone Handling – Coordinated global attacks!


https://www.flickr.com/photos/soul_stealer/8249718101/

# Don't repeat this failure…

- // hit the humans while they are celebrating!
- Date attackDate = new Date(2013, 12, 25);

+1900

0-based (No Range Checking!)

In the yea 3914 3

https://www.flickr.com/photos/frogdna/6948427148/

# January 25th, 3914 : Failed Zombie Trooper Invasion


https://www.flickr.com/photos/starwarsblog/516181007/

# ZombieTime – Undead Trainer for JSR 310

# Basic Concepts

- LocalDate, LocalTime, LocalDateTime
  - Represents a calendar date, time, or both
- Instant
  - Amount of time since the epoch – ideal for timestamps and calculations
- Period
  - A span of time between two dates (goes well with LocalDateTime)
- Duration
  - A precise span of time (goes well with Instants)

# Creating Dates and Times

- Now
  - LocalDate.now()
- Static
  - LocalDate.of(2013, Month.DECEMBER, 25)  // Use the enums!
  - LocalTime.of(11, 30, 5, 999_999_999)  // Time to go to work…
  - LocalDateTime.of(2013, Month.DECEMBER, 25, 11, 30, 5, 999_999_999)  // Even on Christmas
- Parsing
  - LocalDate.parse()
- Conversion
  - new Date().toInstant()
  - Calendar.getInstance().toInstant()

# PixelatedClock

```
Timeline clockTimeline = new Timeline(
  new KeyFrame(Duration.millis(1),
  actionEvent -> {
    LocalTime now = LocalTime.now();
}));
```

ZombieTime

23:03:37.164

# Formatting Dates and Times

- Constants
  - DateTimeFormatter.BASIC_ISO_DATE  // '2011-12-03+01:00'
  - DateTimeFormatter.ISO_TIME // '10:15:30+01:00'
  - DateTimeFormatter.ISO_DATE_TIME // '2011-12-03T10:15:30+01:00[Europe/Paris]'
  - DateTimeFormatter.ISO_WEEK_DATE // 2012-W48-6'
- Localized Formatters
  - DateTimeFormatter.ofLocalizedTime(FormatStyle.SHORT)
- Strings
  - date.toString("d MMM uuuu")  // '25 Dec 2014'
- Formatters are immutable and thread-safe for reuse!

# Localized PixelatedClock

```
DateTimeFormatter clockFormat =
DateTimeFormatter.ofLocalizedTime(FormatStyle.SHORT);


Timeline clockTimeline = new Timeline(
  new KeyFrame(Duration.millis(1),
  actionEvent -> {
    setText(now.format(clockFormat));
}));
```

ZombieTime

9:02 AM

GAME OVER

# I HATE SUNBURN!

https://www.flickr.com/photos/rosenwald/4534092922/

# Using LocalTime/LocalDate

- Comparing Times/Dates:
  - time.isBefore(LocalTime.NOON) // before noon
  - date.isAfter(LocalDate.ofYearDay(2014, 365 / 2)) // appx. halfway through the year
- Year Info:
  - date.getYear()
  - date.getDayOfYear()
  - date.lengthOfYear()
  - date.isLeapYear()
- Time Info:
  - time.getHour() / time.getMinute() / time.getSecond() / time.getNano()

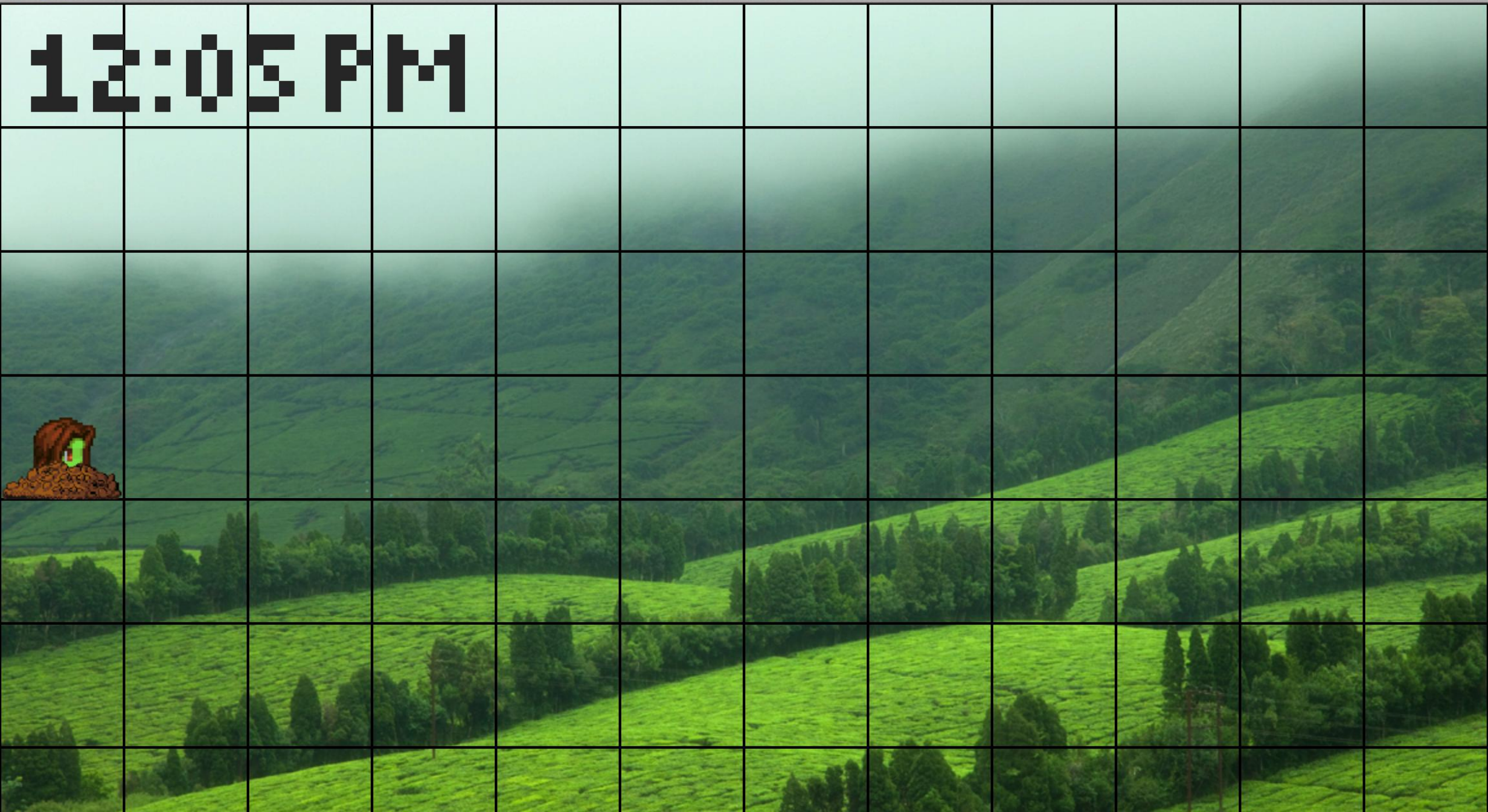
# Hide from the sunlight!

```
public BooleanProperty isNight = new
SimpleBooleanProperty();


isNight.setValue(now.isAfter(LocalTime.of(6, 0)) &&
now.isBefore(LocalTime.of(19, 0)));


underground.bind(Main.pixelatedClock.isNight.not());
```

ZombieTime



# Let's Add Some Villagers!

```
children.add(new SpriteView.Fred(new Location(8, 2)));
children.add(new SpriteView.Sam(new Location(9, 4)));
children.add(new SpriteView.Ted(new Location(7, 6)));
children.add(new SpriteView.Sarah(new Location(5, 4)));
children.add(new SpriteView.Jenn(new Location(6, 5)));
```


8:58 AM
Ouch! Don't step on me

# Using Time Zones

Creating ZoneIds:

- zoneId = ZoneId.of("Europe/Paris");
- zoneId = ZoneId.of(ZoneId.SHORT_IDS.get("EST"));
- zoneId = ZoneOffset.ofHours(-8);

Using ZoneIds:

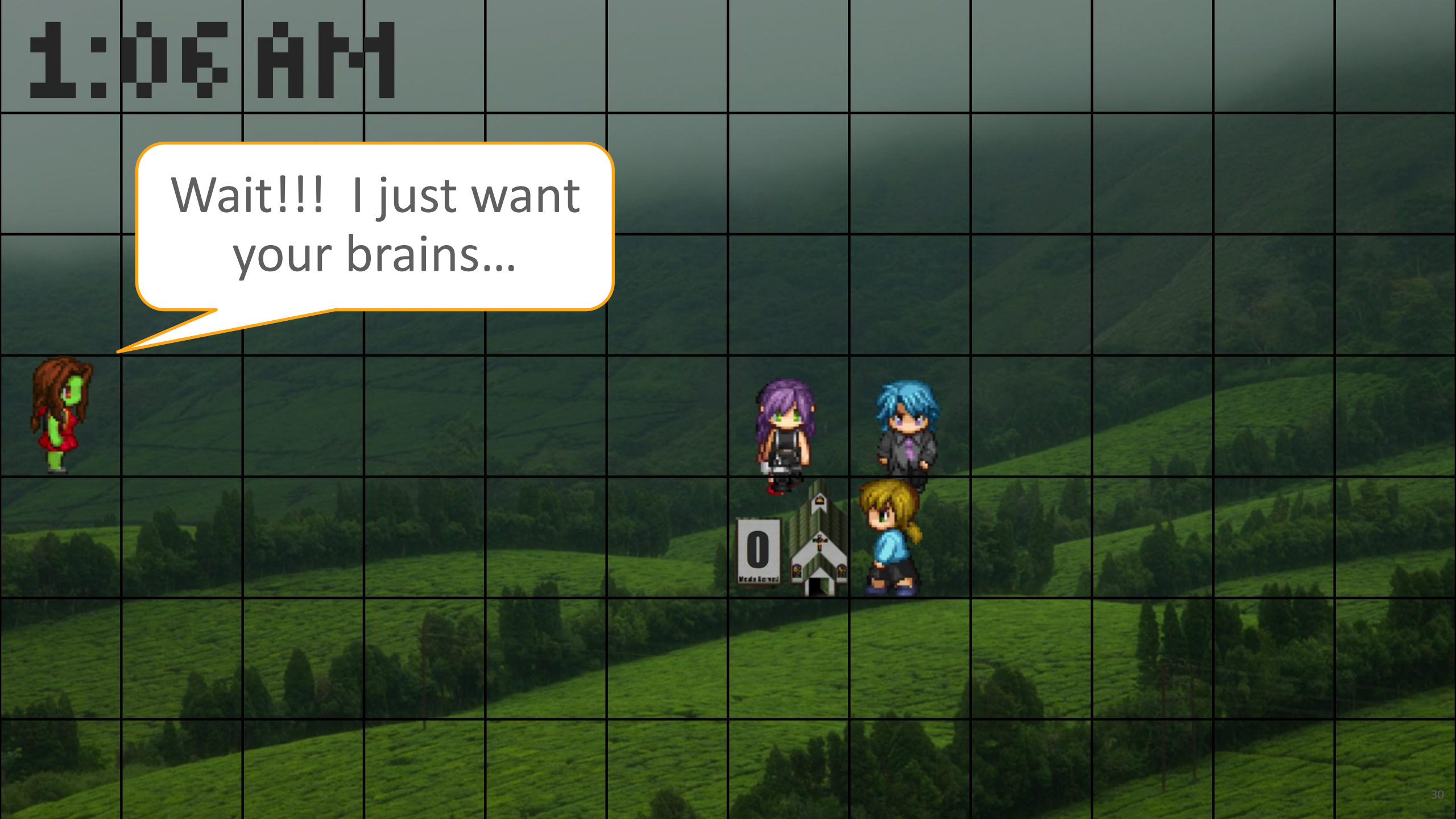
- dateTime.now(zoneId);
- dateTime.atZone(zoneId);
- Clock.system(zoneId);

# Make it Night!

```
ZoneId zoneId = ZoneId.of("Europe/London");
LocalTime now = LocalTime.now(zoneId);
```

# Make it Night! (with a clock)

```
ZoneId zone = ZoneId.of("Europe/London");
Clock clock = Clock.system(zone);
LocalTime now = LocalTime.now(clock);
```

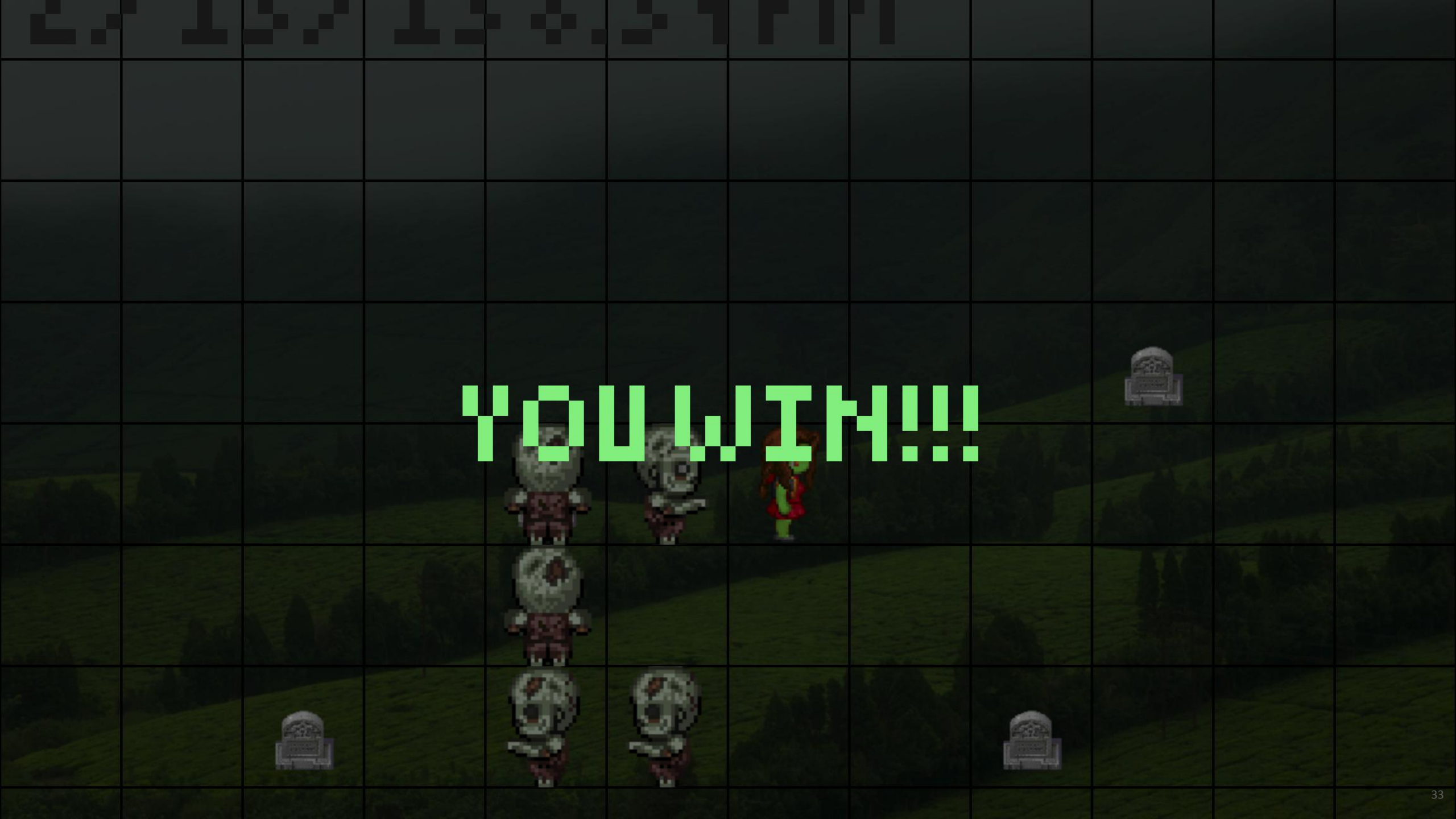

1:06 AM
Wait!!! I just want your brains…

# Temporal Adjustors

- Predefined adjustors for common cases
  - First or last day of month
    - date.with(TemporalAdjusters.firstDayOfMonth())
  - First or last day of year
    - date.with(TemporalAdjusters.firstDayOfNextYear())
  - Last Friday of the month
    - date.with(TemporalAdjusters.lastInMonth(DayOfWeek.FRIDAY))
- Custom adjustors for your own business logic

# Friday 13th TimeAdjustor

```
TemporalAdjuster friday13Adjuster = temporal -> {
    if (temporal.get(ChronoField.DAY_OF_MONTH) > 13) temporal =
        temporal.plus(1, ChronoUnit.MONTHS);
    temporal = temporal.with(ChronoField.DAY_OF_MONTH, 13);
    System.out.println("temporal = " + temporal);
    while (temporal.get(ChronoField.DAY_OF_WEEK) !=
           DayOfWeek.FRIDAY.getValue()) {
        temporal = temporal.plus(1, ChronoUnit.MONTHS);
        System.out.println("temporal = " + temporal);
    }
    return temporal;
};
```


YOU WIN!!!


https://www.flickr.com/photos/s1mone/1833002341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NightHacking Tour


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