

COMP90041
Programming and Software Development
2020 - Semester 2
Lab 11

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Introduction

- ❖ **Timetable**

- ❖ Tue(18) 16:15-17:15 (Melbourne Time)
 - ❖ <https://unimelb.zoom.us/j/94854648719?pwd=WUY0NmR6MkI5UVZBUWhGNWFIU216Zz09>
- ❖ Wed(19) 17:15-18:15 (Melbourne Time)
 - ❖ <https://unimelb.zoom.us/j/93723434766?pwd=MGh4QkJuZnhJR21LZ0VqeXhJQU52UT09>

- ❖ **GitHub Page (Tutorial Materials, Solutions, Additional Resources)**

- ❖ <https://github.com/Beaconsyh08/COMP90041-2020SEM2>

- ❖ **PollEv**

- ❖ <https://pollev.com/yuhsong>

Outline

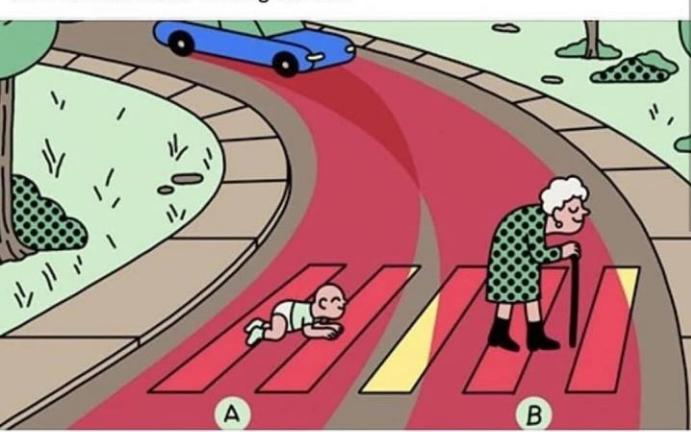
- ❖ Final Project
- ❖ Survey



innovative_coder



Who should a self-driving car kill?



TECHNOLOGYREVIEW.COM

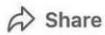
Should a self-driving car kill the baby or the grandma?
Depends on where you're from

1 583

479 Comments 333



Comment

If you drift you should be able to take out
both of them.

Like · Reply · 23h



1,294 likes

innovative_coder Read the comment 😊

... more

View all 23 comments

10 hours ago



Final Project

- ❖ Read through the specification
- ❖ If you find any doubts, read a more carefully of the **specification**
- ❖ The first choice is a search on the **discussion board**, if not been answered, post on it. That will help your peers who have the same doubts. (avoid same questions has been answered many times, but through email only)
- ❖ If you have more specific doubts, you could email us

Class Invariant

- ❖ In computer programming, specifically object-oriented programming, a **class invariant** (or type invariant) is an invariant used for **constraining** objects of a class. Methods of the class should **preserve** the invariant. The class invariant constrains the state stored in the object.

```
/*@invariant day >= 1 && day <= 31; @*/ //class invariant
/*@invariant hour >= 0 && hour <= 23; @*/ //class invariant

/*
@requires d >= 1 && d <= 31;
@requires h >= 0 && h <= 23;
*/
public DemoDate (int d, int h) { // constructor
    day = d;
    hour = h;
}
```

Random Seed

- ❖ A **random seed** (or seed state, or just seed) is a number (or vector) used to **initialize a pseudorandom number generator**.
- ❖ A pseudorandom number generator's number sequence is **completely determined by the seed**: thus, if a pseudorandom number generator is reinitialized with the **same seed**, it will produce the **same sequence of numbers**.
- ❖ **Truly Random**: Non-Determinism, natural
- ❖ **Pseudorandom**: Determinism, computer
- ❖ [Pseudorandom number generators | Computer Science | Khan Academy]
<https://www.youtube.com/watch?v=GtOt7EBNEwQ&t=1s>

Random Seed for Computer

- ❖ A **random seed** specifies the **start point when a computer generates a random number sequence**. This can be any number, but it usually comes from **seconds** on a **computer system's clock** (Henkemans & Lee, 2001)
- ❖ → **Unix Time:** January 1st, 1970 ~ January 19, 2038 UTC
- ❖ On this date the Unix Time Stamp will cease to work due to a 32-bit overflow. Before this moment millions of applications will need to either **adopt a new convention** for time stamps or be **migrated to 64-bit systems** which will buy the time stamp a "bit" more time.
- ❖ [Current Unix Time] <https://www.epochconverter.com/>

Why Seed

- ❖ Computers don't generate **truly random numbers** — they are **deterministic**, which means that they **operate by a set of rules**. (Just toy example, **much much more complicated** in reality)
 - ❖ For example, "**take a number x, add 900, then subtract 52.**" In order for the process to start, you have to specify a starting number, x (the seed). Let's take the starting number **77**:
 - ❖ $77 + 900 - 52 = 925$
 - ❖ Following the same algorithm, the second "random" number would be:
 - ❖ $925 + 900 - 52 = 1773$
 - ❖ **Same output** of random numbers again:
 - ❖ If you set **77**, you will get the **same number sequence**.
 - ❖ If you set **33**, you'll get an **entirely different number sequence**.

Some Methods for Random in Java

`setSeed(long seed)`

Sets the seed of this random number generator using a single `long` seed.

`nextInt()`

Returns the next pseudorandom, uniformly distributed `int` value from this random number generator's sequence.

`nextInt(int bound)`

Returns a pseudorandom, uniformly distributed `int` value between 0 (inclusive) and the specified value (exclusive), drawn from this random number generator's sequence.

- ❖ <https://docs.oracle.com/javase/8/docs/api/java/util/Random.html>

Command-Line Arguments

- ❖ A Java application can accept **any number** of arguments from the **command line**. This allows the user to **specify configuration information** when the application is launched.
- ❖ The user enters command-line arguments when invoking the application and specifies them **after the name of the class** to be run.
- ❖ When an application is launched, the runtime system passes the command-line arguments to the application's **main method** via an **array of Strings → args**

```
public static void main(String[] args) {
```

Command-Line Arguments Conventions

- ❖ The **dash character (-)** precedes options, **flags**, or series of flags.
- ❖ Arguments can be given **in any order**, except where an argument requires another argument.
- ❖ **Flags** can be listed **in any order**, separately or **combined**: **-xn** or **-nx** or **-x -n** or **-n -x**.
- ❖ Filenames typically come last.
- ❖ The program prints **a usage error** when a command line argument is **unrecognized**. Usage statements usually take the form:

usage: *application_name* [optional_args] required_args

- ❖ <http://journals.ecs.soton.ac.uk/java/tutorial/java/cmdLineArgs/parsing.html>

Parsing Numeric Command-Line Arguments

- ❖ If an application needs to support a **numeric** command-line argument, it **must convert a String argument** that represents a number, such as "34", **to a numeric value**.
- ❖ **parseInt** throws a **NumberFormatException** if the format of `args[i]` isn't valid. All of the Number classes — Integer, Float, Double, and so on — have **parseXXX** methods that convert a **String representing a number** to an object of their type.
- ❖ <https://docs.oracle.com/javase/tutorial/essential/environment/cmdLineArgs.html>

Survey

- ❖ <https://forms.gle/AFGHbBigvTnwUh6q7>



- ❖ No Official survey from Unimelb this year due to the pandemic
- ❖ This is created by myself, fill it if you willing to (not compulsory)

Recording

- ❖ <https://github.com/Beaconsyh08/COMP90041-2020SEM2>
- ❖ I will provide you with the recordings of tutorials probably on next week via **my repo**.
- ❖ Typically we won't provide the recordings. However, due to the pandemic, if you haven't been able to attend the tutorials, there is a chance for you to catch up.
- ❖ The general feedback and common mistakes for Assignment2 will be announced via Our **Discord Server**

ANYTHING ABOUT THIS SUBJECT. PLEASE USE EMAIL OR DISCUSSION BOARD ONLY!!!

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