

## Homework 8

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- 1.1) The frame, engine, wheels, wires, tubes, lights, mirrors, protective glass for lights, drivetrain. I don't think any of them are manufactured at the plant because the plant is for assembling parts that were already made beforehand.
- 1.2) Lights, wiring, carpet, tiling beneath carpet, bed, mattress, sheets, wood, nuts, screws.
- 1.3) I will need a GPU, CPU, RAM, Memory, power supply, Fans, RGB. None of the parts are made by the company because they just order the parts from other companies that actually specialize in making components from scratch. The computer company simply is good at making designs and figuring out how to put the right components together.
- 2.1) To be able to use commands and methods that are not already in the basic Java utility component. Import command allows us to expand what we can do with code by bringing in different libraries of Java into the scope.
- 2.2) Primitive types don't need an import as they are already built into the Java language unlike component types and Java has special syntax already built-in for primitive types but not for component types.
- 2.3) Boolean type

```
if ((0 <= yourAge) && (yourAge <= 3)) {  
    output.println("My, just "+yourAge+" years old!");  
    output.println("What a cute little baby");  
} else {  
    output.println("Thanks for entering your age.");  
}
```

2.4)

- 2.5) 4 years: Oh no! A teenager. 15 years: Oh no! A teenager. 102 years: Oh no! A teenager.
- 3.1) My car and phone
- 3.2) The most prominent in society is second possibility, and the reason why the same should not apply to using software components is that it will waste a lot more time figuring out what a component does than just reading up on it. Another reason is that it can cause issues while the program is using the components since the implementer did not know most of the components functions before using it.
- 3.3) One example is the Volume:  $l \times w \times h$  another example is cardinality of a set:  $2^x$  (x=elements within set)
- 3.4) Mathematical models are very precise and are rigid, meaning that the meaning of their models don't change over time. Mathematical models are very easy to manipulate and formal, making it a perfect solution for scientists and engineers
- 3.5) 0,-1,-2
- 3.6) Because there are no additional constraints needed for the model, since it uses constraints from other models
- 4.1) Should be able to display the time, calculate the difference between current time and a time they input, change from military to standard time
- 4.2) Because there are 4 formal parameters to the constructor
- 4.3) The requires clause is concerned with incoming values, and the requires clause is not specified like that is because it only talks about incoming parameters so it doesn't need to distinguish between incoming and outgoing parameters
- 4.4) myClock = 3:25:48 AM newHours=3

4.5) Sets this.seconds to newSeconds

Parameters:

newSeconds – new seconds for this

Updates:

this.seconds

Requires:

$0 \leq \text{newSeconds} \leq 59$

Ensures:

This.minutes = newSeconds

4.6) myClock = 11:31:48 AM newMinutes = 31, myClock = 11:52:48 AM newMinutes = 52

4.7) myClock = 11:25:48 AM am=true

4.8) Boolean because it can either be true or false

4.9) the value to be returned by isAM is this.am

4.10) this = #this

4.11) int minutes()

Reports this.minutes.

Returns:

this.minutes.

Ensures:

minutes = this.minutes.

4.12) int seconds()

Reports this.seconds.

Returns:

`this.seconds.`

Ensures:

`seconds = this.seconds.`

4.13) `myClock = (8,2,43,true)`

`yourClock = (11,18,6,false)`

`transferMinutes = 2`

`myClock = (8,2,43,true)`

`yourClock = (11,2,6,false)`

`transferMinutes = 2`