

# Edinburgh Concurrency Workbench

## Getting Started

Colin Stirling (cps)

School of Informatics

10th October 2013

# The Edinburgh Concurrency Workbench

- ▶ Type `cwb` on a dice machine

# The Edinburgh Concurrency Workbench

- ▶ Type `cwb` on a dice machine
- ▶ All commands end with a semicolon `;` and a newline

# The Edinburgh Concurrency Workbench

- ▶ Type `cwb` on a dice machine
- ▶ All commands end with a semicolon `;` and a newline
- ▶ Type `quit;` to finish a session

# The Edinburgh Concurrency Workbench

- ▶ Type `cwb` on a dice machine
- ▶ All commands end with a semicolon `;` and a newline
- ▶ Type `quit;` to finish a session
- ▶ Defining processes

```
agent Process = a.0 + 'a.Process;
```

# The Edinburgh Concurrency Workbench

- ▶ Type cwb on a dice machine
- ▶ All commands end with a semicolon ; and a newline
- ▶ Type quit; to finish a session
- ▶ Defining processes

```
agent Process = a.0 + 'a.Process;
```

- ▶ Process names begin with upper case and action names are written in lower case

# The Edinburgh Concurrency Workbench

- ▶ Type `cwb` on a dice machine
- ▶ All commands end with a semicolon `;` and a newline
- ▶ Type `quit;` to finish a session
- ▶ Defining processes

`agent Process = a.0 + 'a.Process;`

- ▶ Process names begin with upper case and action names are written in lower case
- ▶ `'a` denotes the action  $\bar{a}$

# The Edinburgh Concurrency Workbench

- ▶ Type `cwb` on a dice machine
- ▶ All commands end with a semicolon `;` and a newline
- ▶ Type `quit;` to finish a session
- ▶ Defining processes

```
agent Process = a.0 + 'a.Process;
```

- ▶ Process names begin with upper case and action names are written in lower case
- ▶ `'a` denotes the action  $\bar{a}$
- ▶ Process can be used in other definitions

```
agent Process1 = b.Process | a.Process;
```



# Modal logic in the workbench

- ▶  $\text{tt}$  is written  $\mathbf{T}$

# Modal logic in the workbench

- ▶ `tt` is written `T`
- ▶ `ff` is written `F`

# Modal logic in the workbench

- ▶  $tt$  is written  $\mathbf{T}$
- ▶  $ff$  is written  $\mathbf{F}$
- ▶  $\wedge$  is written  $\&$

# Modal logic in the workbench

- ▶ `tt` is written `T`
- ▶ `ff` is written `F`
- ▶ `∧` is written `&`
- ▶ `∨` is written `|`
- ▶ Defining properties

```
prop Property = ⟨a⟩T;
```

# Modal logic in the workbench

- ▶ `tt` is written `T`
- ▶ `ff` is written `F`
- ▶ `∧` is written `&`
- ▶ `∨` is written `|`
- ▶ Defining properties

`prop Property = <a>T;`

- ▶ `Property` can be used in other definitions

`prop Property1 = [b]Property | [a]F;`

## CTL<sup>-</sup> in the workbench

- ▶ The workbench's specification language is not CTL<sup>-</sup>, but the *modal mu-calculus*.

## CTL<sup>-</sup> in the workbench

- ▶ The workbench's specification language is not CTL<sup>-</sup>, but the *modal mu-calculus*.
- ▶ CTL<sup>-</sup> can be encoded into the mu-calculus. The encoding is contained in a file that can be downloaded from the modules homepage. After giving it a name, say `ctl.cwb`, type the command

## CTL<sup>-</sup> in the workbench

- ▶ The workbench's specification language is not CTL<sup>-</sup>, but the *modal mu-calculus*.
- ▶ CTL<sup>-</sup> can be encoded into the mu-calculus. The encoding is contained in a file that can be downloaded from the modules homepage. After giving it a name, say `ctl.cwb`, type the command
- ▶ `input "ctl.cwb";`



## CTL<sup>-</sup> in the workbench

- ▶ The workbench's specification language is not CTL<sup>-</sup>, but the *modal mu-calculus*.
- ▶ CTL<sup>-</sup> can be encoded into the mu-calculus. The encoding is contained in a file that can be downloaded from the modules homepage. After giving it a name, say `ctl.cwb`, type the command
- ▶ `input "ctl.cwb";`
- ▶ AG  $\Phi$  is written `AG ( $\Phi$ )`

## CTL<sup>-</sup> in the workbench

- ▶ The workbench's specification language is not CTL<sup>-</sup>, but the *modal mu-calculus*.
- ▶ CTL<sup>-</sup> can be encoded into the mu-calculus. The encoding is contained in a file that can be downloaded from the modules homepage. After giving it a name, say `ctl.cwb`, type the command
- ▶ `input "ctl.cwb";`
- ▶ AG  $\Phi$  is written `AG ( $\Phi$ )`
- ▶ Given a process  $E$  and a property  $P$ , the command  
`checkprop(E,P);`  
checks if  $E$  satisfies  $P$

## CTL<sup>-</sup> in the workbench

- ▶ The workbench's specification language is not CTL<sup>-</sup>, but the *modal mu-calculus*.
- ▶ CTL<sup>-</sup> can be encoded into the mu-calculus. The encoding is contained in a file that can be downloaded from the modules homepage. After giving it a name, say `ctl.cwb`, type the command
- ▶ `input "ctl.cwb";`
- ▶ AG  $\Phi$  is written `AG ( $\Phi$ )`
- ▶ Given a process  $E$  and a property  $P$ , the command  
`checkprop(E,P);`  
checks if  $E$  satisfies  $P$
- ▶ Answer the questions about playing games with "no".