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(and her friend Ama

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Contents

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Miranda / Amanda

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- Miranda will run on U
- For Windows, you c
  Cygwin **or** you c
- Amanda is a PC version of Miranda
- Amanda is almost (but not quite) the same as Miranda!
- Get it from the link on Moodle - although it hasn't been tested on the latest v

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Miranda Installation on OS X

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- OS X's System Integrity Protection (SIP) feature (El Capitan +) prevents changes to /usr (but not /usr/local).
- Miranda installs in
- Thus, to install Mira
  - (i) force install
  - (ii) disable SIP, install Miranda in the standard place, then re-enabl
- The first way is better - it doesn't require rebooting OS X and there is no dan re-enable SIP. But the procedure is slightly ugly :

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  - tar xpf mira-2044-x86_64-Darwin.tar -C /usr/local
  - sudo ln -s /usr/local/usr/local/bin/mira /usr/local/bin/mira

Miranda Demonstration

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- Interpretive envir
- Simple use as a calcu
- Simple definition
  intermediate code that is interpreted)
- Main definition — the function called "main" is special in Amanda bu
- Define and use functions

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Miranda Demonstration

- Similar to the Lambda Calculus

Miranda $(3 + 4) * (6 + 7)$

- But (inside a program file) you can give names to expressions

$$inc\ x = x + 1$$
$$main = inc\ 56$$

- Also give names to functions (no lambdas!)

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Comments

- VERY important !
- Use them from the start
- Example :

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```
||a simple definition for some text
message = "hello mum"
||here is a function which adds one to a n
inc x = x + 1    ||another c
```

Legal names

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- BINDING :
  - NAME = EXPRESSION
  - funcname arg
    - Binds fu
    - Binds a
  - Each binding is _____
    - Scope of argname is the function body (only)
    - Nested scopes (see later) permit nested bindings for the same nam
      λ-calculus supports such name clashes, but they are generally no
- Names MUST start with an alphabetic character
- Names MUST NOT start with a capital letter
  - and thereafter may contain uppercase and lowercase characters, numbers and underscores

Types

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- Data can be, for exa
  - Numbers (42, i
  - Characters (
  - Text ("string
  - Truth values (True) is of type **bool**
  - Functions are of type **argtype -> resulttype**. E.g. the f pe **num -> num**
- Types help organize data and programs better
- Helps detect errors - the type system is a debugger

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Type Checking and Type Inference

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- Performed at com
- Checks that operat
- Checks that functi
- On the command line you can ask "what type is this?"
- In a program you can specify "this is a Boolean value" etc
- If types are not given, Miranda will attempt to INFER types from the wa used

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Tuples

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- A simple data struct
- ("Sheila Bloggs", 23, "
- (34, True) is of type (num, bool)
- (34, True) DOES NOT EQUAL (True, 34)
- ("increment", (+1), inc) is of type [char], num->num, num->num

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Simple Functions

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```
inc : : num -> num
inc x = x + 1

|| the hello function
hello : : num -> [char]
hello x = "good morning" , if x<=10
        ="goodbye" , otherwise
```

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Summary

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- Miranda/Aman
- Miranda demonst
- Comments
- Legal names and binding
- Types and type checking
- Tuples
- Simple functions

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