

Last login: Mon Jan 29 15:42:36 on ttys006

carbon:\$ pwd

/project/evw/Teaching/18\_Spring\_2041/carbon-repos/public-class-repo/Sample Programs/Sec\_01\_1-25pm

carbon:\$ uto

-bash: uto: command not found

carbon:\$ utop

Welcome to utop version 2.0.2 (using OCaml version 4.06.0)!

Type #utop\_help for help about using utop.

```
-( 13:38:03 )-< command 0 >-----{ counter: 0 }-
utop # #use "find_and_lookup.ml";;
val m : (string * int) list =
  [("dog", 1); ("chicken", 2); ("dog", 3); ("cat", 5)]
val lookup_all : 'a -> ('a * 'b) list -> 'b list = <fun>
val find_all_by : ('a -> 'b -> bool) -> 'a -> 'b list -> 'b list =
  <fun>
-( 13:38:08 )-< command 1 >-----{ counter: 0 }-
utop # find_all_by (fun x y -> x = y) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [5; 5; 5]
-( 13:38:08 )-< command 2 >-----{ counter: 0 }-
utop # find_all_by (fun x y -> x > y) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [1; 2; 3; 4; 4]
-( 13:39:25 )-< command 3 >-----{ counter: 0 }-
utop # find_all_by (fun x y -> x < y) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [6; 6; 7]
-( 13:39:53 )-< command 4 >-----{ counter: 0 }-
utop # find_all_by (fun ch n -> n = Char.code ch) 'z' [92;93;94;95;96;97;98;99;100
] ;;
- : int list = []
-( 13:40:18 )-< command 5 >-----{ counter: 0 }-
utop # Char.code ;;
- : char -> int = <fun>
-( 13:43:02 )-< command 6 >-----{ counter: 0 }-
utop # Char.code 'z' ;;
- : int = 122
-( 13:43:10 )-< command 7 >-----{ counter: 0 }-
utop # find_all_by (fun ch n -> n = Char.code ch) 'z' [92;93;94;95;96;97;98;99;100
;122;123;122] ;;
- : int list = [122; 122]
-( 13:43:10 )-< command 8 >-----{ counter: 0 }-
utop # #use "find_and_lookup.ml";;
val m : (string * int) list =
  [("dog", 1); ("chicken", 2); ("dog", 3); ("cat", 5)]
val lookup_all : 'a -> ('a * 'b) list -> 'b list = <fun>
val find_all_by : ('a -> 'a -> bool) -> 'a -> 'a list -> 'a list =
  <fun>
-( 13:43:23 )-< command 9 >-----{ counter: 0 }-
utop # find_all_by (fun x y -> x = y) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [5; 5; 5]
-( 13:44:21 )-< command 10 >-----{ counter: 0 }-
```

```

utop # find_all_by (=) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [5; 5; 5]
-( 13:46:04 )<- command 11 >-----{ counter: 0 }-
utop # (=) ;;
- : 'a -> 'a -> bool = <fun>
-( 13:46:19 )<- command 12 >-----{ counter: 0 }-
utop # find_all_by (>) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [1; 2; 3; 4; 4]
-( 13:46:22 )<- command 13 >-----{ counter: 0 }-
utop # (+) ;;
- : int -> int -> int = <fun>
-( 13:46:33 )<- command 14 >-----{ counter: 0 }-
utop # ( *
) ;;
- : int -> int -> int = <fun>
-( 13:47:38 )<- command 15 >-----{ counter: 0 }-
utop # List.sort ;;
- : ('a -> 'a -> int) -> 'a list -> 'a list = <fun>
-( 13:47:49 )<- command 16 >-----{ counter: 0 }-
utop # 1 + 3 :: [] ;;
- : int list = [4]
-( 13:49:21 )<- command 17 >-----{ counter: 0 }-
utop # let find_all = find_all_by (=) ;;
val find_all : 'weak1 -> 'weak1 list -> 'weak1 list = <fun>
-( 13:57:49 )<- command 18 >-----{ counter: 0 }-
utop # let find_all elem lst = find_all_by (=) elem lst ;;
val find_all : 'a -> 'a list -> 'a list = <fun>
-( 13:59:46 )<- command 19 >-----{ counter: 0 }-
utop # (=) ;;
- : 'a -> 'a -> bool = <fun>
-( 14:00:42 )<- command 20 >-----{ counter: 0 }-
utop # (fun x -> x + 1) = (fun y -> 1 + y)
;;
Exception: Invalid_argument "compare: functional value".
-( 14:01:14 )<- command 21 >-----{ counter: 0 }-
utop # #use "find_and_lookup.ml";;
val m : (string * int) list =
  [("dog", 1); ("chicken", 2); ("dog", 3); ("cat", 5)]
val lookup_all : 'a -> ('a * 'b) list -> 'b list = <fun>
val find_all_by : ('a -> 'b -> bool) -> 'a -> 'b list -> 'b list =
  <fun>
val find_all_with : ('a -> bool) -> 'a list -> 'a list = <fun>
val find_all_by' : ('a -> 'b -> bool) -> 'a -> 'b list -> 'b list =
  <fun>
val find_all_with' : ('a -> bool) -> 'a list -> 'a list = <fun>
-( 14:15:31 )<- command 22 >-----{ counter: 0 }-
utop # find_all_by (>) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [1; 2; 3; 4; 4]
-( 14:15:31 )<- command 23 >-----{ counter: 0 }-
utop # find_all_by' (>) 5 [ 1;2;3;4;5;6;5;4;5;6;7] ;;
- : int list = [1; 2; 3; 4; 4]
-( 14:16:08 )<- command 24 >-----{ counter: 0 }-
utop # find_all_with (fun x -> x = 4) [1;2;3;4;5;4;5;6] ;;
- : int list = [4; 4]

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-( 14:16:14 )-< command 25 >-----{ counter: 0 }-
utop # find_all_with' (fun x -> x = 4) [1;2;3;4;5;4;5;6] ;;
- : int list = [4; 4]
-( 14:16:39 )-< command 26 >-----{ counter: 0 }-
utop # #quit;;
carbon:$ git add find_and_lookup.ml
carbon:$ up
/project/evw/Teaching/18_Spring_2041/carbon-repos/public-class-repo/Sample Program
s
carbon:$ cd utop-sessions/Sec_01_1-25pm/
carbon:$ mv ~/Desktop/utop_Jan_31.pdf .
carbon:$ git add utop_Jan_31.pdf
carbon:$ git commit -m "Jan 31 materials"
[master 8b9d759] Jan 31 materials
 2 files changed, 29 insertions(+)
 create mode 100644 Sample Programs/Sec_01_1-25pm/find_and_lookup.ml
 create mode 100644 Sample Programs/utop-sessions/Sec_01_1-25pm/utop_Jan_31.pdf
carbon:$ git push
To github.umn.edu:umn-csci-2041S18/public-class-repo.git
 ! [rejected]          master -> master (fetch first)
error: failed to push some refs to 'git@github.umn.edu:umn-csci-2041S18/public-cla
ss-repo.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository pushing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
carbon:$ utop

```

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Welcome to utop version 2.0.2 (using OCaml version 4.06.0)!

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Type #utop\_help for help about using utop.

```

-( 14:44:32 )-< command 0 >-----{ counter: 0 }-
utop # let eq x y = x = y ;;
val eq : 'a -> 'a -> bool = <fun>
-( 14:44:32 )-< command 1 >-----{ counter: 0 }-
utop # eq 5 6 ;;
- : bool = false
-( 14:44:47 )-< command 2 >-----{ counter: 0 }-
utop # eq 5 5 ;;
- : bool = true
-( 14:44:54 )-< command 3 >-----{ counter: 0 }-
utop # eq "H" "H" ;;
- : bool = true
-( 14:44:57 )-< command 4 >-----{ counter: 0 }-
utop # #quit;;
carbon:$ upp
/project/evw/Teaching/18_Spring_2041/carbon-repos/public-class-repo/Sample Program
s
carbon:$ cd Sec_01_1-25pm/
carbon:$ utop

```

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Welcome to utop version 2.0.2 (using OCaml version 4.06.0)!

Type #utop\_help for help about using utop.

```
-( 14:45:54 )-< command 0 >-----{ counter: 0 }-
utop # #use "find_and_lookup.ml";;
val m : (string * int) list =
  [("dog", 1); ("chicken", 2); ("dog", 3); ("cat", 5)]
val lookup_all : 'a -> ('a * 'b) list -> 'b list = <fun>
val find_all_by : ('a -> 'b -> bool) -> 'a -> 'b list -> 'b list = <fun>
val find_all_with : ('a -> bool) -> 'a list -> 'a list = <fun>
val find_all_by' : ('a -> 'b -> bool) -> 'a -> 'b list -> 'b list = <fun>
val find_all_with' : ('a -> bool) -> 'a list -> 'a list = <fun>
-( 14:45:54 )-< command 1 >-----{ counter: 0 }-
utop # let myeq x y = x = y ;;
val myeq : 'a -> 'a -> bool = <fun>
-( 14:45:59 )-< command 2 >-----{ counter: 0 }-
utop # find_all_by myeq 5 [1;2;3;4;5;4;5;6] ;;
- : int list = [5; 5]
-( 14:46:10 )-< command 3 >-----{ counter: 0 }-
utop # find_all_by (>) 5 [1;2;3;4;5;4;5;6] ;;
- : int list = [1; 2; 3; 4; 4]
-( 14:46:20 )-< command 4 >-----{ counter: 0 }-
utop # find_all_by < 5 [1;2;3;4;5;4;5;6] ;;
Error: Syntax error
-( 14:49:14 )-< command 5 >-----{ counter: 0 }-
utop # find_all_by (<=) 5 [1;2;3;4;5;4;5;6] ;;
- : int list = [5; 5; 6]
-( 14:49:26 )-< command 6 >-----{ counter: 0 }-
utop # (=) ;;
- : 'a -> 'a -> bool = <fun>
-( 14:49:35 )-< command 7 >-----{ counter: 0 }-
utop # myeq ;;
- : 'a -> 'a -> bool = <fun>
-( 14:49:56 )-< command 8 >-----{ counter: 0 }-
utop # let bit str = String.length > 10 ;;
Error: This expression has type int but an expression was expected of type
      string -> int
-( 14:50:00 )-< command 9 >-----{ counter: 0 }-
utop # let big str = String.length > 10 ;;
Error: This expression has type int but an expression was expected of type
      string -> int
-( 15:03:05 )-< command 10 >-----{ counter: 0 }-
utop # let big str = String.length str > 10 ;;
val big : string -> bool = <fun>
-( 15:03:09 )-< command 11 >-----{ counter: 0 }-
utop # big "asfd" ;;
- : bool = false
-( 15:03:19 )-< command 12 >-----{ counter: 0 }-
utop # big "asdfadfasdfasd" ;;
- : bool = true
-( 15:03:28 )-< command 13 >-----{ counter: 0 }-
utop # big "0123456789" ;;
```

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- : bool = false
-( 15:03:32 )-< command 14 >-----{ counter: 0 }-
utop # big "01234567890" ;;
- : bool = true
-( 15:03:41 )-< command 15 >-----{ counter: 0 }-
utop # (fun str -> String.length str > 10) "asdf" ;;
- : bool = false
-( 15:03:45 )-< command 16 >-----{ counter: 0 }-
utop # (fun str -> String.length str > 10) "asdadsfasdfadsff" ;;
- : bool = true
-( 15:04:09 )-< command 17 >-----{ counter: 0 }-
utop # find_all_with ;;
- : ('a -> bool) -> 'a list -> 'a list = <fun>
-( 15:04:15 )-< command 18 >-----{ counter: 0 }-
utop # big ;;
- : string -> bool = <fun>
-( 15:08:13 )-< command 19 >-----{ counter: 0 }-
utop # find_all_with big ["asdf"; "asdfasdfasdf"] ;;
- : string list = ["asdfasdfasdf"]
-( 15:09:14 )-< command 20 >-----{ counter: 0 }-
utop # find_all_by ;;
- : ('a -> 'b -> bool) -> 'a -> 'b list -> 'b list = <fun>
-( 15:09:44 )-< command 21 >-----{ counter: 0 }-
utop # big;;
- : string -> bool = <fun>
-( 15:11:55 )-< command 22 >-----{ counter: 0 }-
utop #

```

Arg	Array	ArrayLabels	Assert_failure	Bigarray	Buffer	Bytes	BytesLabels	Callback	
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