

OCaml 환경 및 기본

2012.11.08

2012 봄, 프로그래밍의 원리

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개발환경

컴파일러 설치

- snucse 계정이 있으면 martini 등 snucse 서버 사용
 - martini에는 3.10.2 버전
 - 최신버전은 3.12.1 (금지)
 - 연구실에선 3.11.2 사용
- ocaml.org
 - caml.inria.fr
- Download -> 각자 OS에 맞는 binary 받기
- 혹은 apt-get(Ubuntu), port(MAC) 패키지 매니저

Windows용 인터프리터

Download

OCaml

The most recent version of OCaml is **4.00.1**. It was released on 2012-10-05. Further information and download links can be found on the [release page](#).

Source distribution for Windows and Unix systems (including Linux, MacOS X, and Cygwin)

- [Gzipped tarball](#)
- [Bzipped tarball](#)

Binary distributions for Linux (Intel x86)

- [Debian packages](#) (part of the Debian distribution)
- [Fedora packages](#) (part of the Fedora distribution)
- [Gentoo packages](#) (part of the Gentoo distribution)

Binary distribution for MacOS X

- [Binary MacOS X package \(4.00.1\) for Intel-based Macs](#)

Binary distributions for Microsoft Windows

- [Self installer \(4.00.0\)](#) for the port based on the MinGW toolchain
Some features require the MinGW/MSYS environment.
- [Cygwin packages](#) (distributed as part of the Cygwin environment)

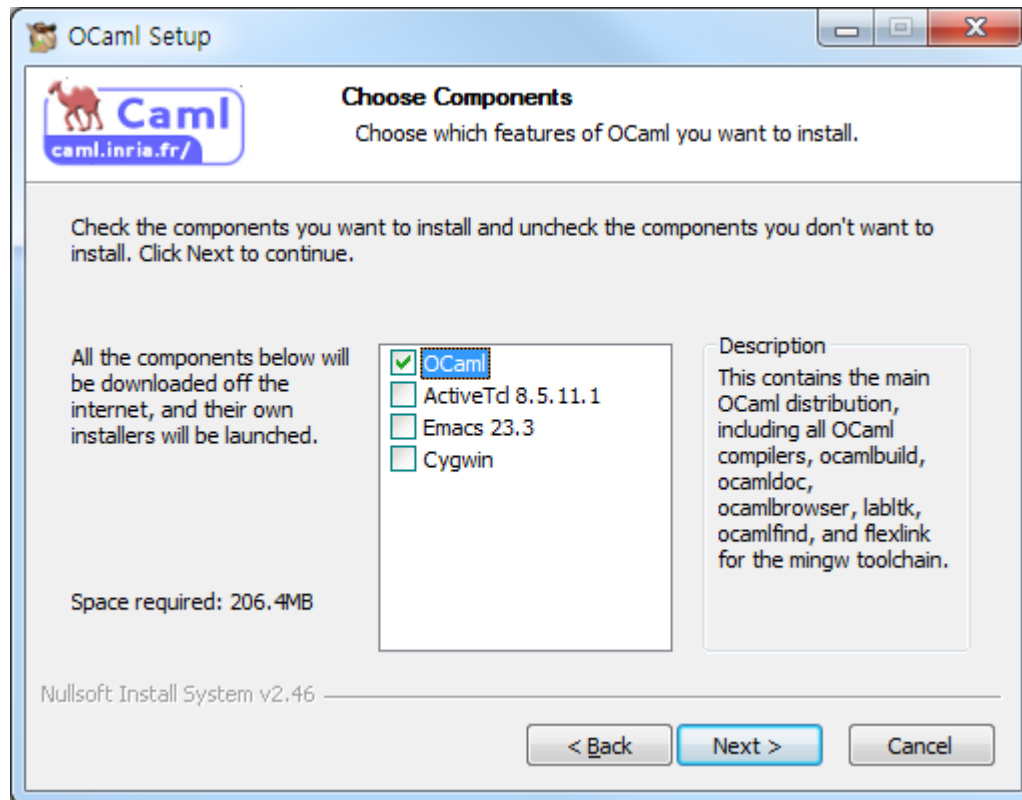
Documentation and User's manual

- Single document in [PostScript](#), [PDF](#) or [plain text](#).
- Bundle of HTML files in a [TAR](#) or [ZIP](#) archive.

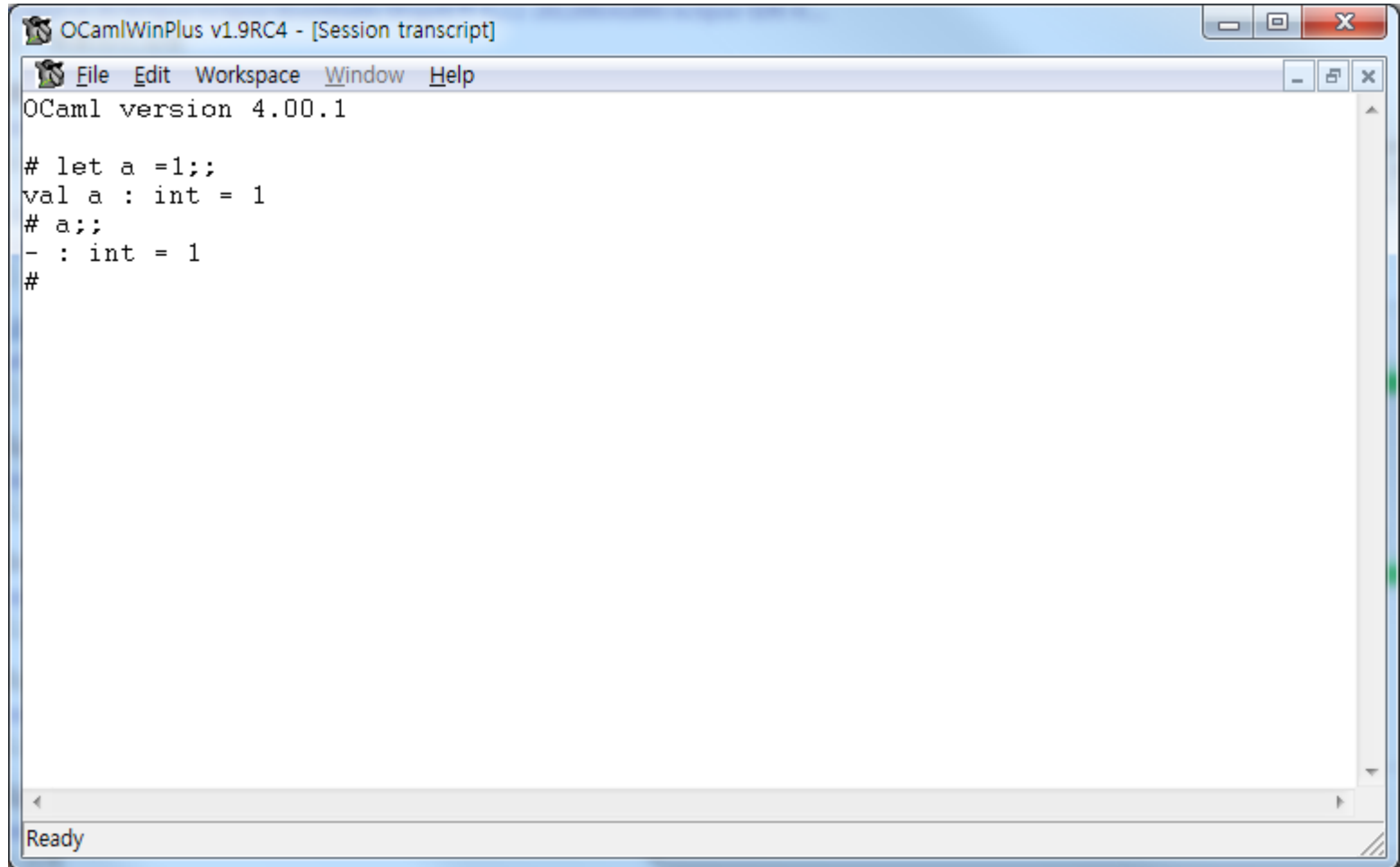
Windows용 인터프리터



Windows용 인터프리터



Windows용 인터프리터



The image shows a screenshot of the OCamlWinPlus v1.9RC4 interpreter window. The window title is "OCamlWinPlus v1.9RC4 - [Session transcript]". The menu bar includes "File", "Edit", "Workspace", "Window", and "Help". The main text area displays the following OCaml code and version information:

```
OCaml version 4.00.1  
  
# let a = 1;;  
val a : int = 1  
# a;;  
- : int = 1  
#
```

The status bar at the bottom left shows "Ready".

eclipse ocaIDE

The screenshot shows the Eclipse website homepage. At the top, there is a navigation bar with links for Home, Downloads, Users, Members, Committers, Resources, Projects, and About Us. A search bar is also present. Below the navigation bar, there is a featured Eclipse Project section, which is currently empty. To the right of this section, there is a yellow button that says "Get Started now... Download Eclipse" with a download icon. Below this button, there are social media links for Twitter (@EclipseFdn) and Facebook (Eclipse Foundation), along with a "3.1.0" version indicator. Further down, there are links for "Plugins", "Contribute", "Documentation", and "Report a Bug".

The "Announcements" section lists several recent updates:

- 2012/11/06 EclipseCon 2013: Call for Papers Deadline Nov 19, 2012**
Submit your proposal now. The EclipseCon Call for Papers deadline for submissions is November 19, 2012.
- 2012/11/06 Eclipse DemoCamps: Nov 11 - 17**
Next weeks' DemoCamps include Vancouver, Canada on November 13 and Hamburg, Germany on November 14.
- 2012/11/05 Register Now for Eclipse Day at the Googleplex 2012**
Eclipse Day at the Googleplex will take place on December 12, 2012 at the Google Mountain View Campus. Click [here](#) to find out more about the event or to register.
- 2012/10/23 Eclipse Survey: Big data, reporting and visualization**
The Eclipse Foundation would like to better understand how developers are using Eclipse with big data and reporting projects. Please take a few minutes to answer this [four question survey](#).
- 2012/10/23 Eclipse DemoCamps: November 2012**
The Eclipse Community is hosting Demo Camps in cities around the world during November 2012. Sign up now to attend or present at a [DemoCamp](#) in your area.

A "More..." link is provided at the end of the announcements list.

The "Community News" section lists:

- 2012/11/05 Chronon Systems releases Chronon 3 with 10x performance improvement**
We have released v3 of Chronon Recording Server and Chronon Time Traveling Debugger. Developers and QA Teams can now experience incredible performance improvements of up to 10X with V3 of the Chronon Recording Server making this the best solution to resolve issues in your development, QA and product...
- 2012/10/30 Actuate Announces Plug In 2 BIRT Contest for Autumn 2012**
Roll up your sleeves and create an awesome extension to BIRT! At EclipseCon Europe 2012, Actuate announced a new worldwide programming contest for developers. Plenty of suggestions, tutorials and code are listed on the contest site. Deadline is Nov 30th for your chance to win an iPad!

The "Eclipse Marketplace" section lists several plugins:

- JDeodorant**
2007/11/28
- Eclipse Icons Editor**
2012/07/04
- Epsilon**
2007/02/19
- Design and Verification Tools - E, SystemVerilog, VHDL**
2008/04/19
- Testdroid Recorder**
2011/10/03

A "View All Plugins" link is located at the bottom right of the marketplace section.

At the top of the page, there is a banner for "eclipseCON EUROPE 2012" with the text "Thanks for a great conference!". To the right of this banner, there are icons for various Eclipse sites and a "Visit other Eclipse Sites" link.

eclipse ocaIDE

www.eclipse.org/downloads/

Pig Toolbox Tip | 해킨토시 경험담 | VI Editor Manual | 서광열의 프로그래... | Detexify LaTeX han... | Scala School | antlr, vim, etc... tips | 까먹지말자! : Linux... | OpenCL - The open... | 그냥 그런 블로그 :: ... | 새벽을 일깨우는 커피

eclipseCON EUROPE 2012 Thanks for a great conference!

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Eclipse Juno (4.2) SR1 Packages for Windows

| | |
|---|----------------------------------|
|  Eclipse IDE for Java EE Developers , 221 MB Downloaded 1,109,909 Times Details | Windows 32 Bit Windows 64 Bit |
|  Eclipse Classic 4.2.1 , 183 MB Downloaded 945,347 Times Details Other Downloads | Windows 32 Bit Windows 64 Bit |
|  Eclipse IDE for Java Developers , 150 MB Downloaded 506,916 Times Details | Windows 32 Bit Windows 64 Bit |
|  JRebel for Eclipse View Java Code Changes Instantly! Free JRebel Trial... Terminate Redeploys! | Download |
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|  Eclipse for Mobile Developers , 144 MB Downloaded 143,946 Times Details | Windows 32 Bit Windows 64 Bit |
|  Eclipse IDE for Java and DSL Developers , 260 MB Downloaded 140,745 Times Details | Windows 32 Bit Windows 64 Bit |
|  Eclipse Modeling Tools , 274 MB Downloaded 90,008 Times Details | Windows 32 Bit Windows 64 Bit |
|  Eclipse for RCP and RAP Developers , 227 MB Downloaded 88,833 Times Details | Windows 32 Bit Windows 64 Bit |

Installing Eclipse


- Install Guide
- Compare/Combine Packages
- Known Issues
- Updating Eclipse



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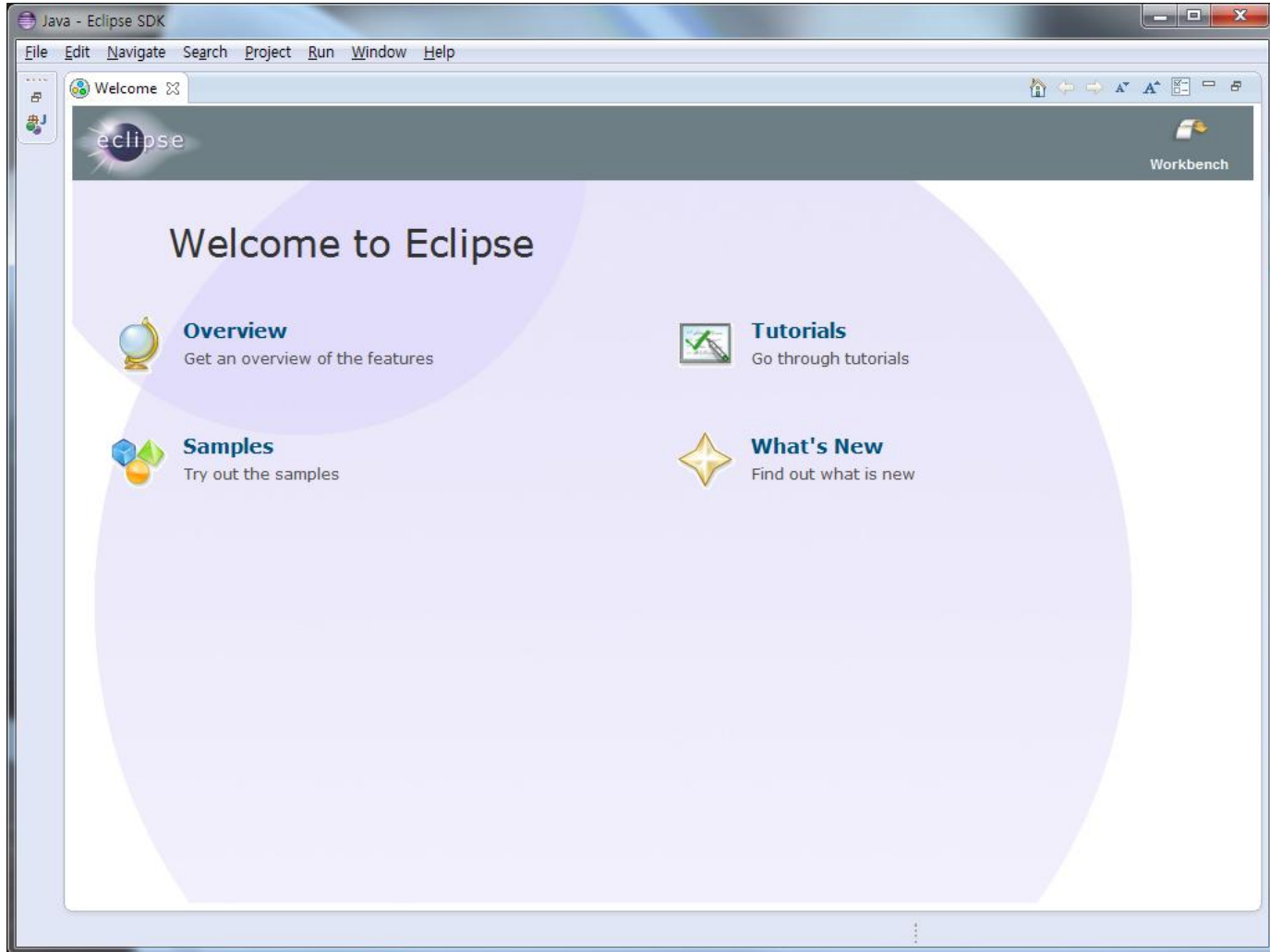


Related Links

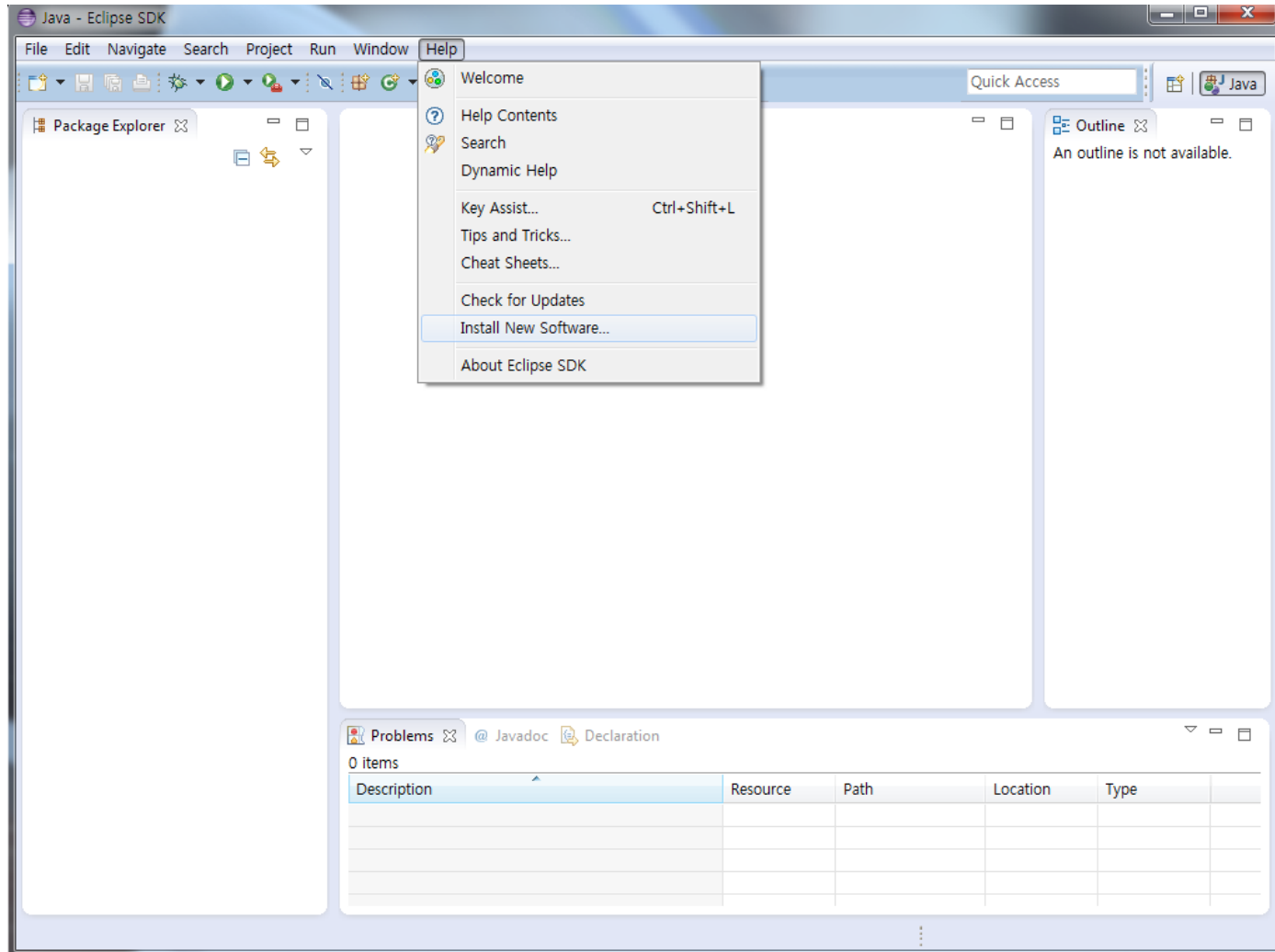
- Documentation
- Make a Donation
- Forums
- Eclipse Juno (4.2)
- Eclipse Indigo (3.7)
- Older Versions

Hint:
You will need a Java runtime environment (JRE) to use Eclipse (Java)

eclipse ocaIDE



eclipse ocaIDE



eclipse ocaIDE

- <http://vimeo.com/35685464>

Cygwin

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Related Sites
Red Hat Cygwin Product

Cygwin

Get that [Linux](#) feeling – on Windows!

This is the home of the Cygwin project

What...

...is it?

Cygwin is:

- a collection of tools which provide a Linux look and feel environment for Windows,
- a DLL (cygwin1.dll) which acts as a Linux API layer providing substantial Linux API functionality.

...isn't it?

Cygwin is not:

- a way to run native Linux apps on Windows. You must rebuild your application *from source* if you want it to run on Windows.
- a way to magically make native Windows apps aware of UNIX® functionality like signals, ptys, etc. Again, you need to build your apps *from source* if you want to take advantage of Cygwin functionality.

The Cygwin DLL currently works with all recent, commercially released x86 32 bit and 64 bit versions of Windows, with the exception of Windows CE and Windows NT4.

For more information see the [FAQ](#).

Current Cygwin DLL version

The most recent version of the Cygwin DLL is [1.7.17-1](#). Install it by running [setup.exe](#).

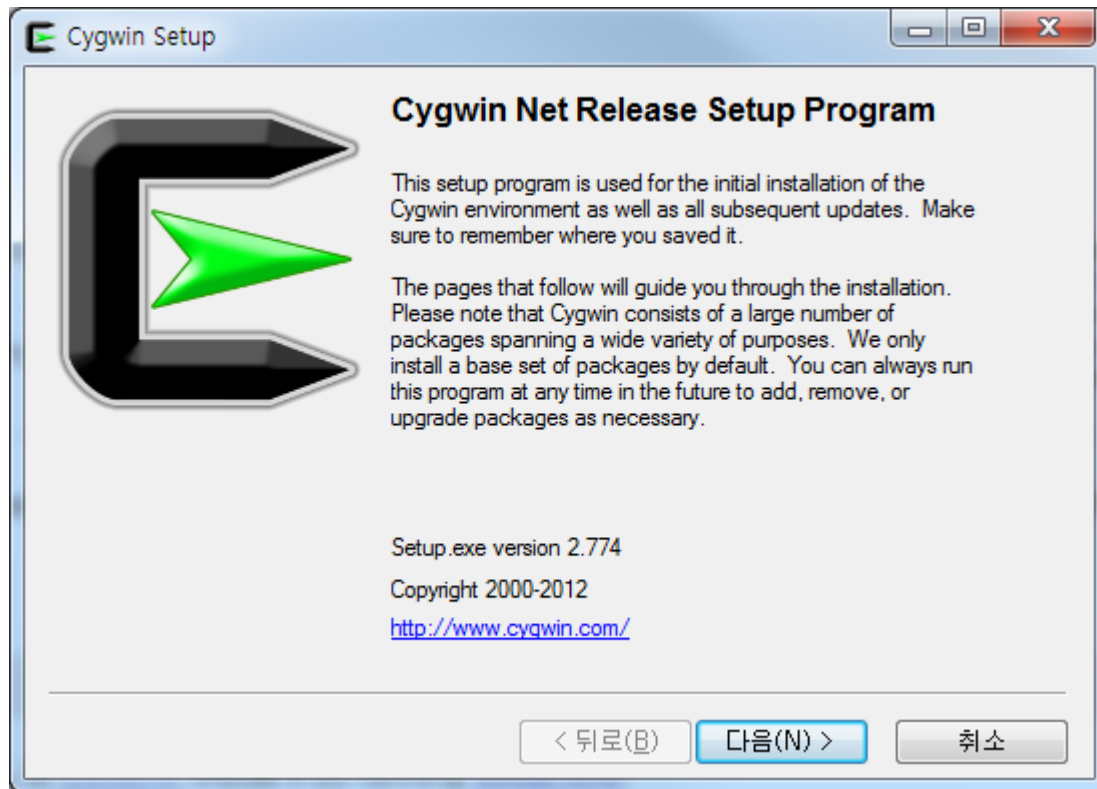
Use [setup.exe](#) to perform a [fresh install](#) or to [update](#) an existing installation.

Note that individual packages in the distribution are updated separately from the DLL so the Cygwin DLL version is not useful as a general Cygwin release number.

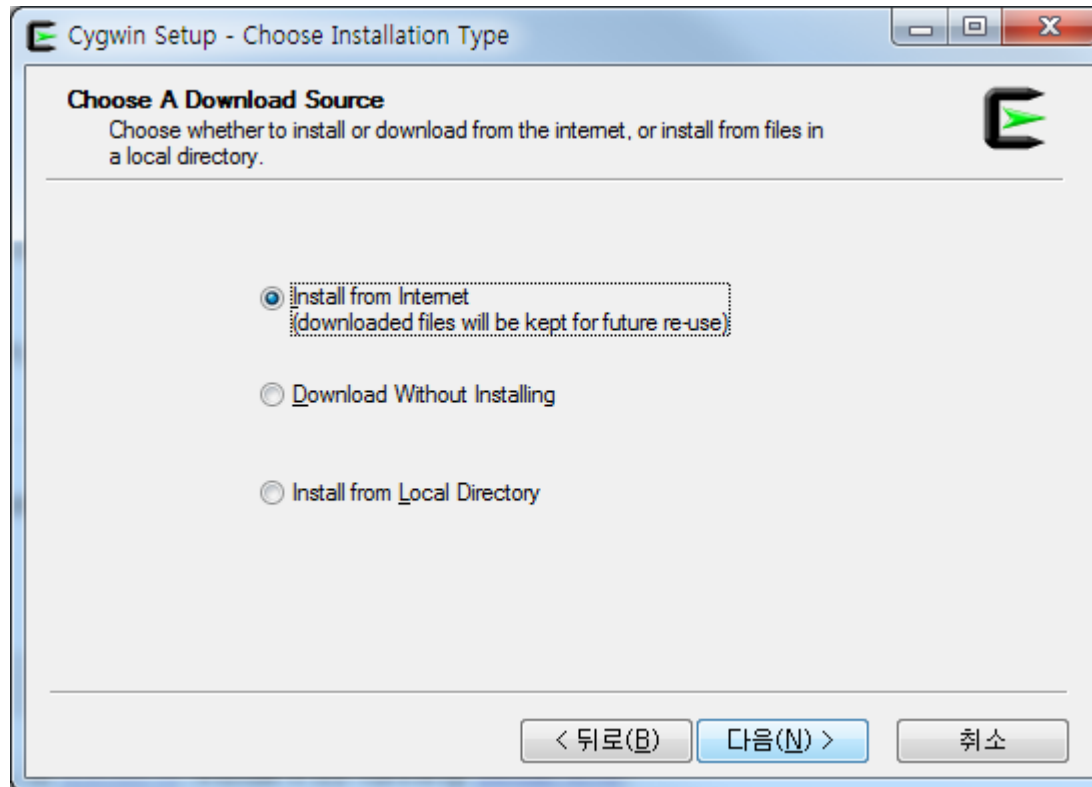
Updating from Cygwin 1.5.x

Updating from Cygwin 1.5.x to Cygwin 1.7.x may require additional **manual changes**. Most notably the mount point storage has been moved from the Windows registry into the `/etc/fstab` file. During installation, standard system mount points are automatically copied from the registry but user mount points *are not copied* into the user-specific `/etc/fstab.d/$USER` file. If you use user mount points then every user will have to run the `/bin/copy-user-registry-fstab` shell script once after the update.

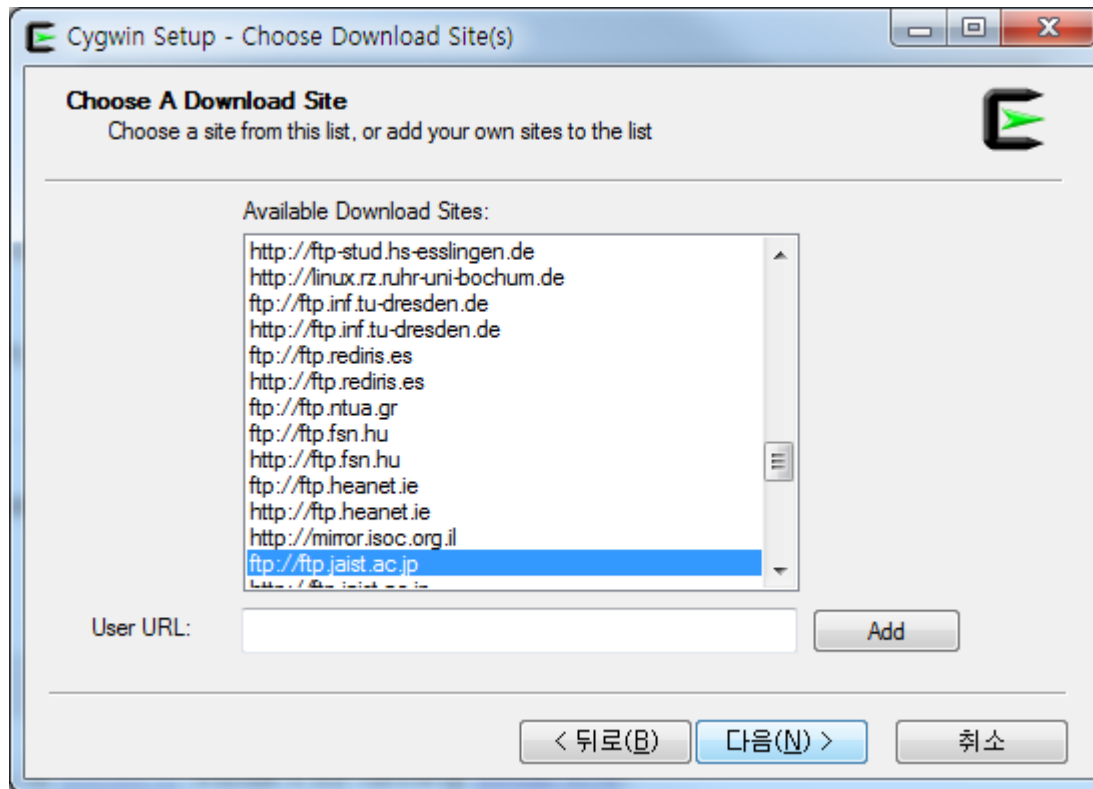
Cygwin



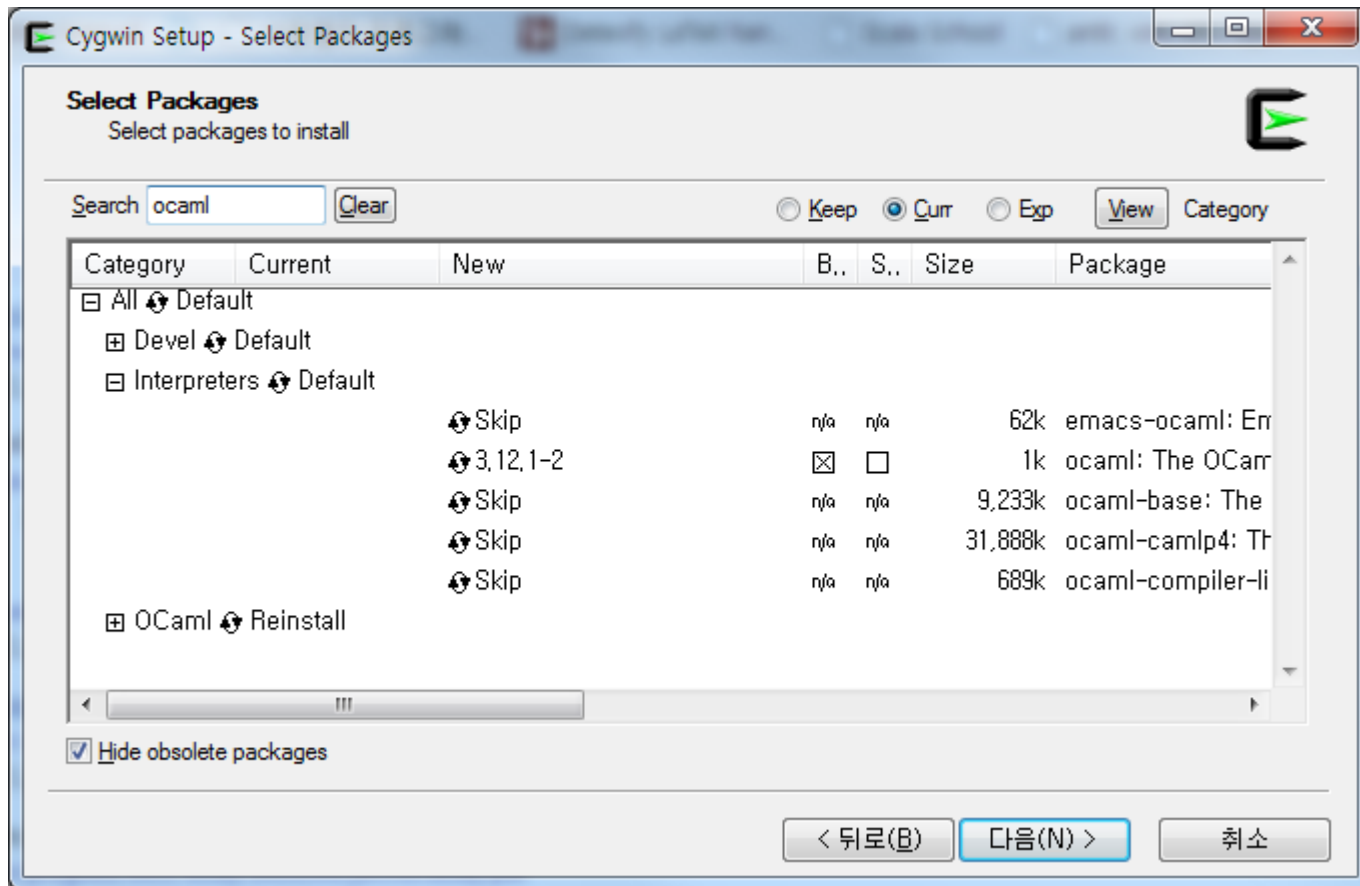
Cygwin



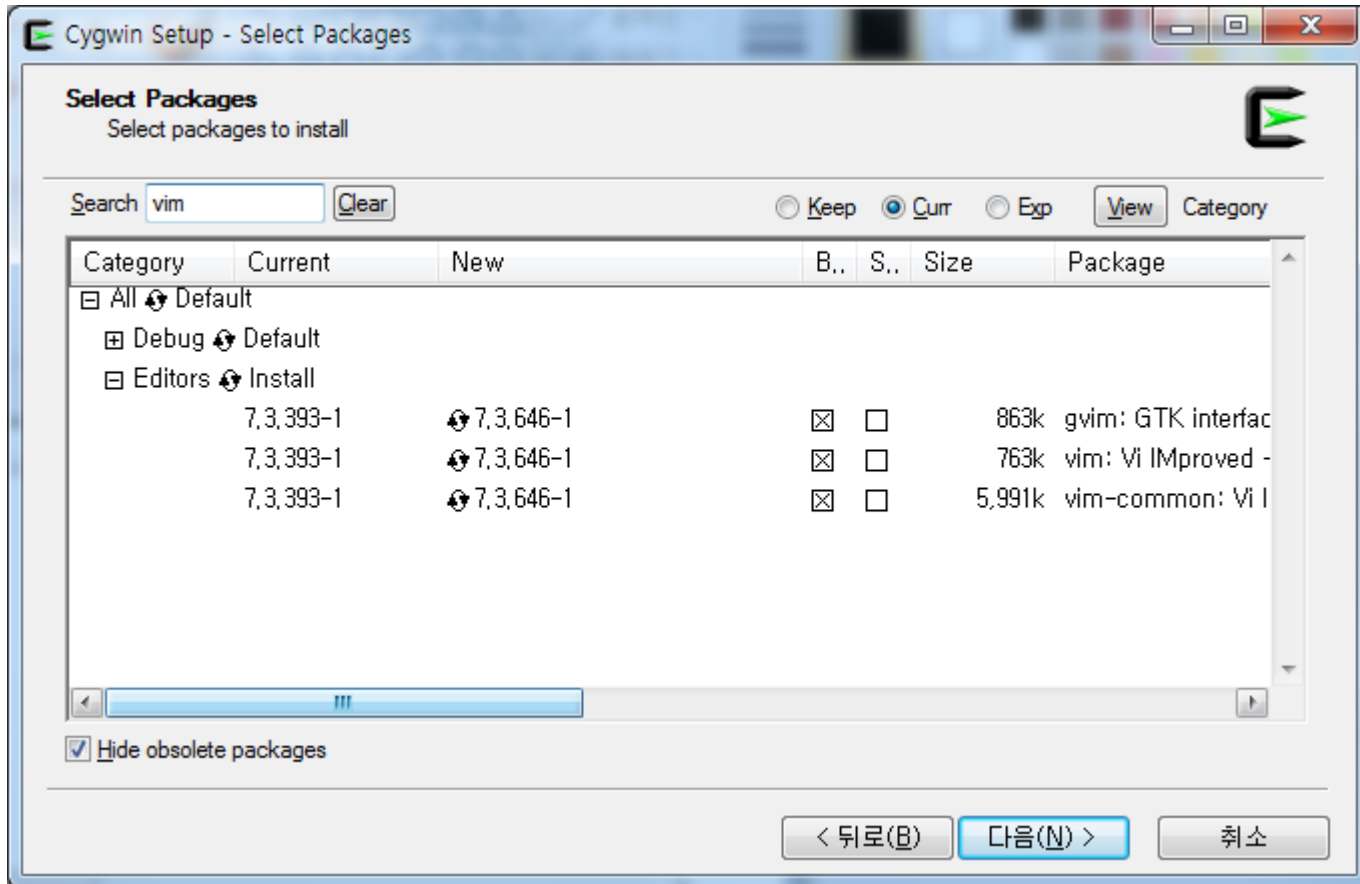
Cygwin



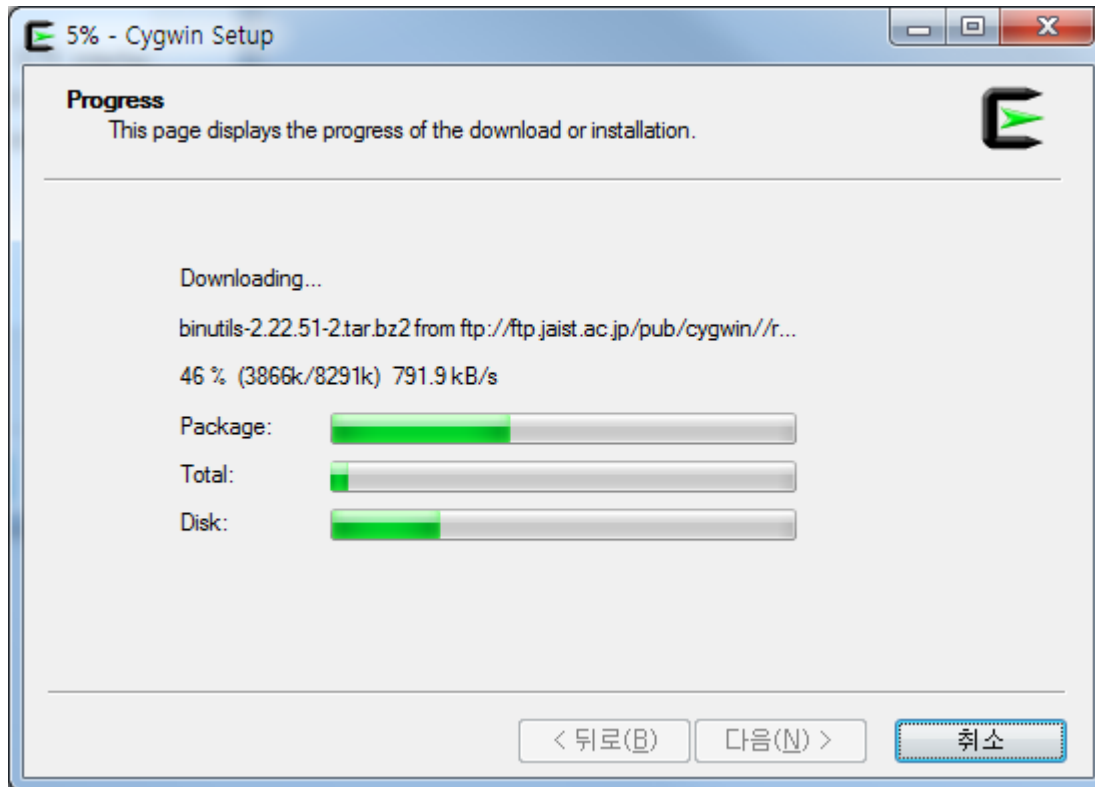
Cygwin



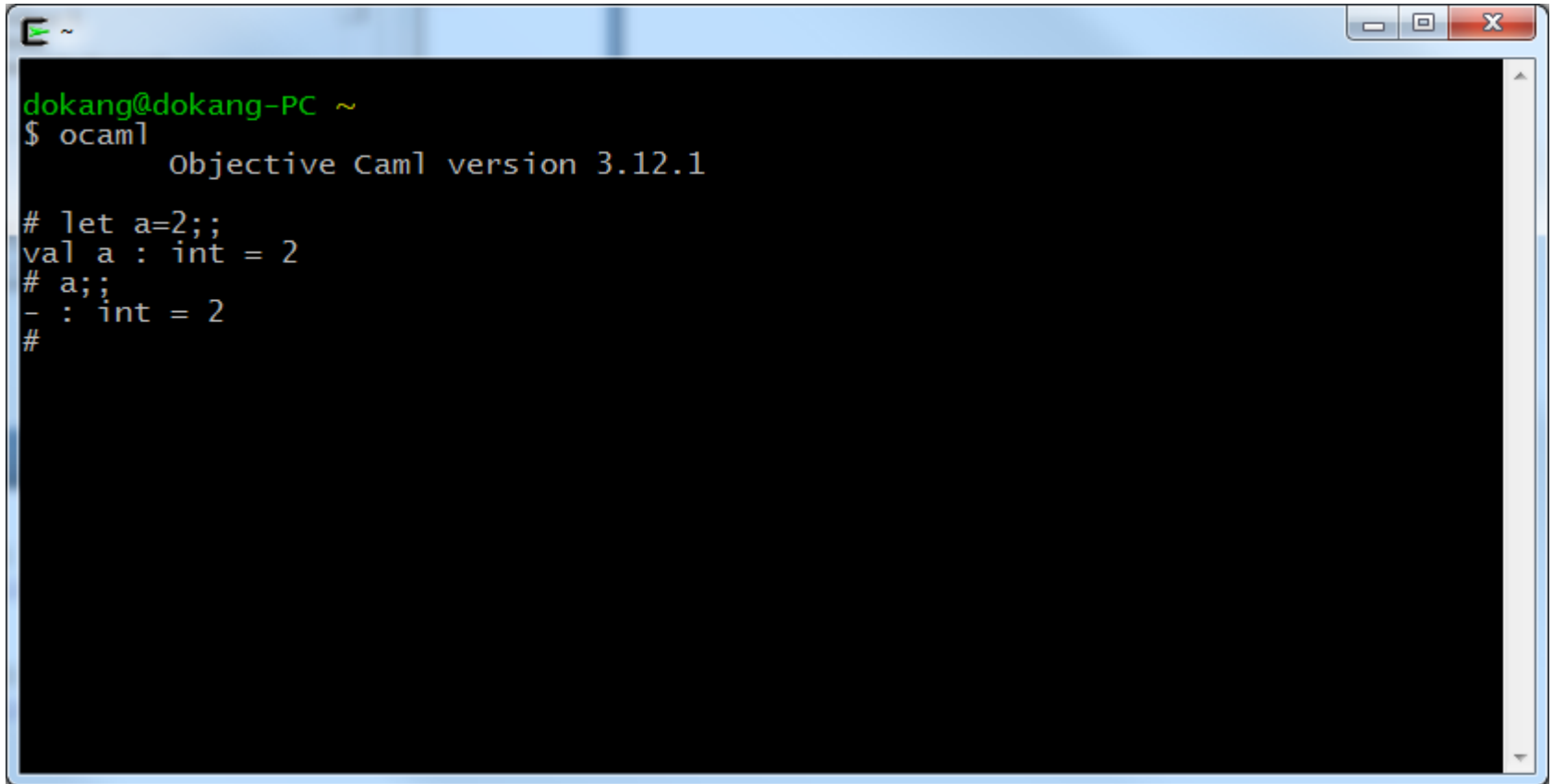
Cygwin



Cygwin



Cygwin

A screenshot of a Cygwin terminal window. The window title bar shows a green icon, a tilde (~), and standard window controls (minimize, maximize, close). The terminal content is as follows:

```
dokang@dokang-PC ~  
$ ocaml  
Objective Caml version 3.12.1  
# let a=2;;  
val a : int = 2  
# a;;  
- : int = 2  
#
```

ocaml 기본

따라해 봅시다-대화형 실행기

```
heychoii@martini: ~  
heychoii@martini:~$ ocaml  
Objective Caml version 3.10.2  
  
# 3;;  
- : int = 3  
# let a = 1;;  
val a : int = 1  
# let b = a + 2;;  
val b : int = 3  
# a + b;;  
- : int = 4  
# let c = 3 in a + c;;  
- : int = 4  
# let incr = fun x -> x+1;;  
val incr : int -> int = <fun>  
# incr 10;;  
- : int = 11  
# let incr x = x+1 in incr 10;;  
- : int = 11  
#
```

따라해 봅시다-대화형 실행기

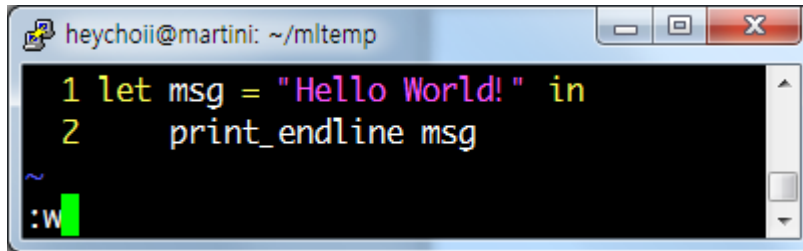
```
heychoii@martini: ~  
# (fun x -> x+1) 1;;  
- : int = 2  
# let s = "hello word!";;  
val s : string = "hello word!"  
# print_endline s;;  
hello word!  
- : unit = ()  
# let l = [1;2;3;4;5];;  
val l : int list = [1; 2; 3; 4; 5]  
# let l2 = 1::2::3::4::5::[];;  
val l2 : int list = [1; 2; 3; 4; 5]  
# let cons a b = a::b;;  
val cons : 'a -> 'a list -> 'a list = <fun>  
#
```

따라해 봅시다-대화형 실행기

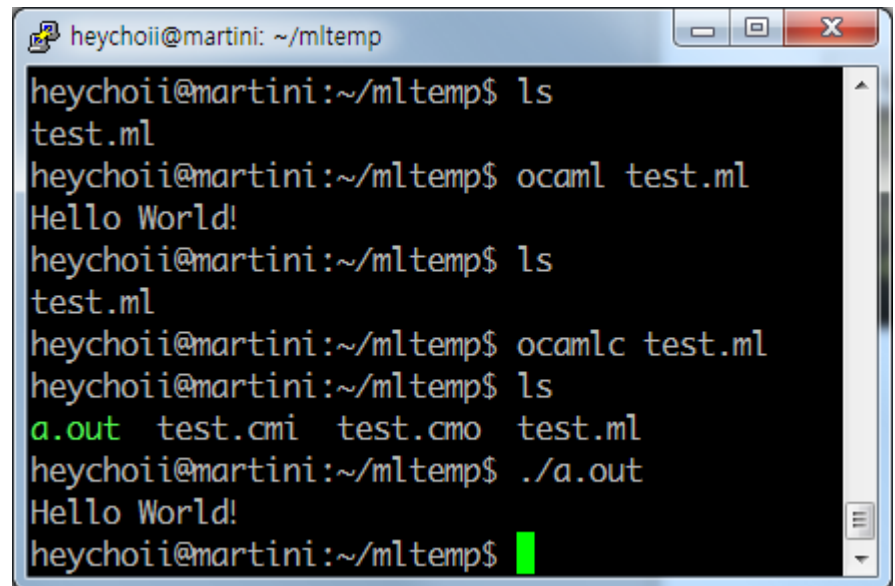
```
heychoii@martini: ~  
# 3.2;;  
- : float = 3.2  
# (1, 2.0);;  
- : int * float = (1, 2.)  
# ("machoi", 100);;  
- : string * int = ("machoi", 100)  
# incr 3;;  
- : int = 4  
# fst ("machoi", 100);;  
- : string = "machoi"  
# snd ("machoi", 100);;  
- : int = 100  
# List.length [1; 2; 3];;  
- : int = 3  
# let rec fact n =  
    if n<0 then raise (Invalid_argument "factorial")  
    else if n=0 then 1  
    else n * fact(n-1)  
    ;;  
val fact : int -> int = <fun>  
# fact 5;;  
- : int = 120  
#
```


컴파일

- 편집 후 컴파일



```
heychoii@martini: ~/mltemp
1 let msg = "Hello World!" in
2   print_endline msg
~
:w
```



```
heychoii@martini: ~/mltemp
heychoii@martini:~/mltemp$ ls
test.ml
heychoii@martini:~/mltemp$ ocaml test.ml
Hello World!
heychoii@martini:~/mltemp$ ls
test.ml
heychoii@martini:~/mltemp$ ocamlc test.ml
heychoii@martini:~/mltemp$ ls
a.out test.cmi test.cmo test.ml
heychoii@martini:~/mltemp$ ./a.out
Hello World!
heychoii@martini:~/mltemp$
```

실행기 vs 컴파일

- 실행기
 - 식을 입력하면 바로 결과를 볼 수 있습니다.
 - 식을 입력하고 ;;로 맺습니다.
 - 끝 땀 #quit;;
- 컴파일(추천)
 - *.ml 파일을 작성해 컴파일합니다.
 - ;;를 붙이지 않습니다.
 - ml 파일은 정의(let) 들의 집합입니다.
 - 과제로는 컴파일이 되는 .ml 파일을 제출합니다.

따라해 봅시다

```
heychoii@martini: ~/mltemp
1 let rec gcd a b =
2   if a=1 || b=1 then 1
3   else if a=b then a
4   else if a<b then gcd b a
5   else gcd (a-b) b
-- 바꾸기 --      1,11      꼭대기
```

```
heychoii@martini: ~/mltemp
1 let rec sum_of_list l =
2   match l with
3   | [] -> 0
4   | h::t -> h + sum_of_list t
~
~
-- 끼워넣기 --      4,32      모두
```

```
heychoii@martini: ~/mltemp
1 let rec length l =
2   match l with
3   | [] -> 0
4   | _::t -> 1 + length t
5
~
~
-- 끼워넣기 --      1,4      모두
```