

CS480

Compilers

Eclipse, SVN, Makefile examples

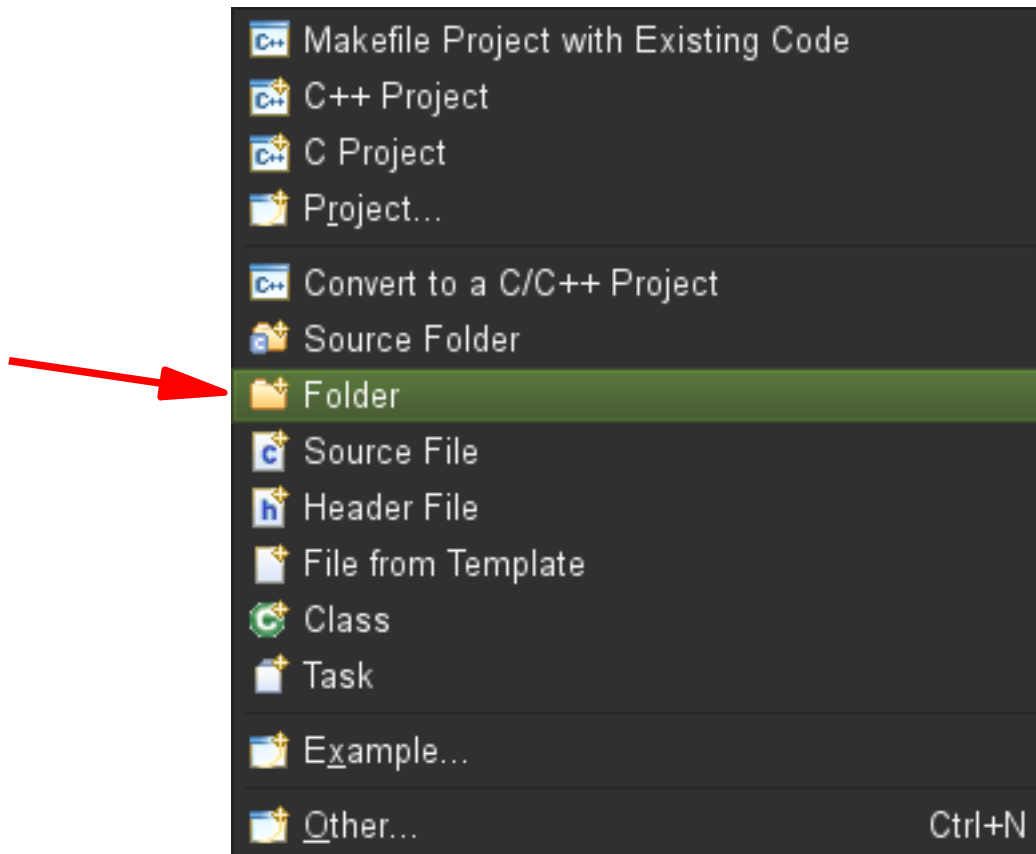
January 31, 2011

New Project

- New Project | C/C++ Project
- Create a New C Project
- Choose Makefile Project
 - EmptyProject
 - Toolchain: Linux GCC
- Next
- Advanced
- C/C++ Build
 - Generate Makefile Automatically (Should already be unchecked! Leave it that way!)
- Finish

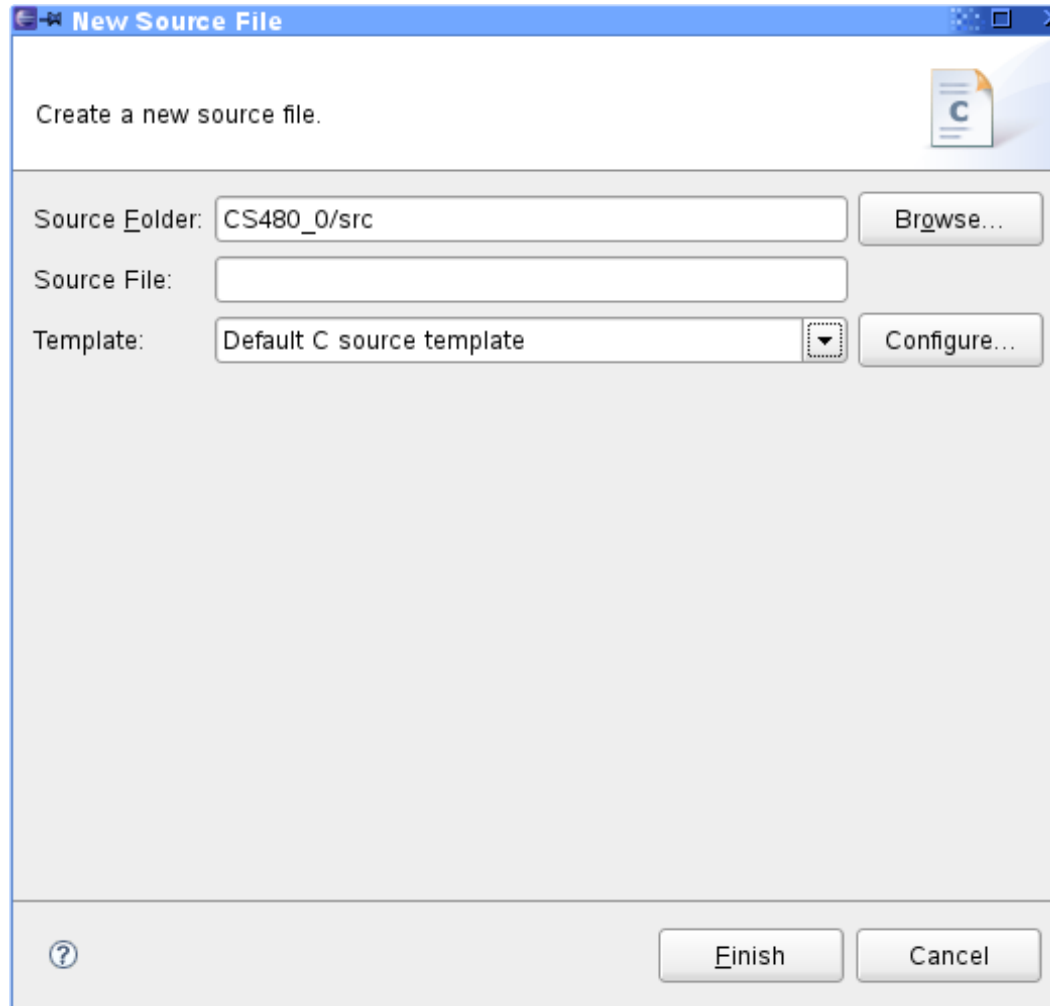
Add Directory

- File | New | Folder



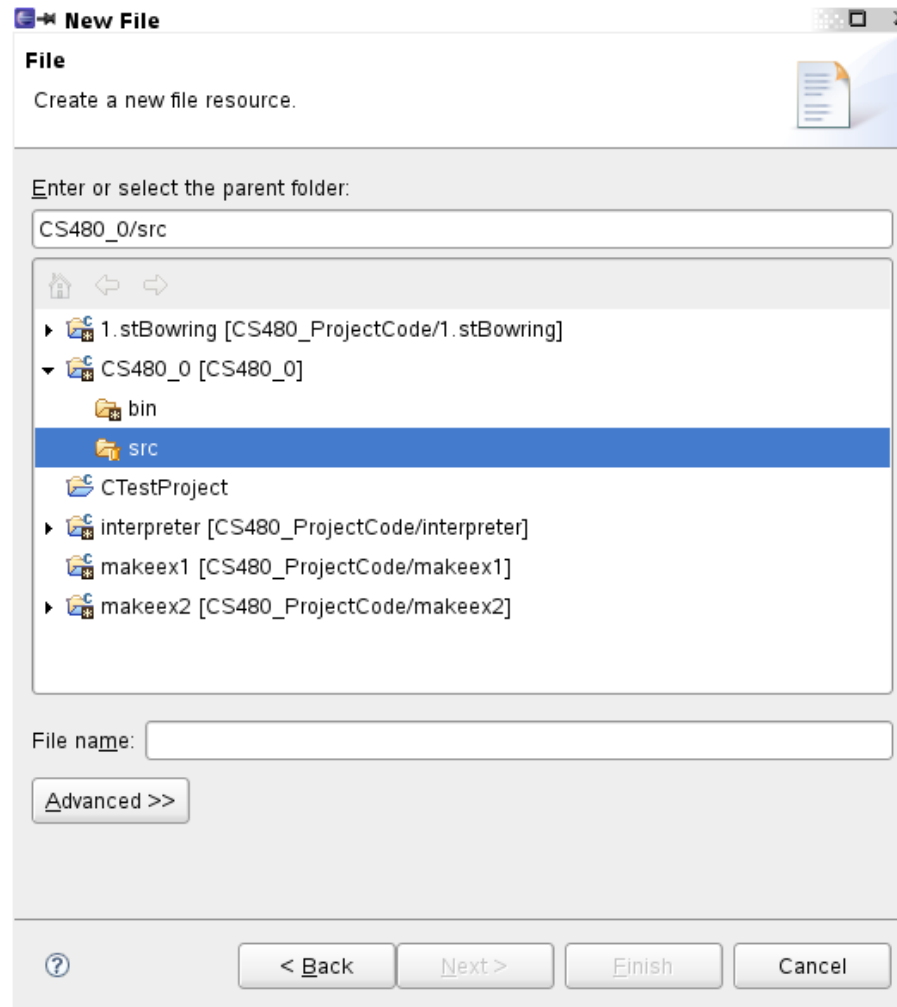
Add Source File

- New | {Source File, Header File}



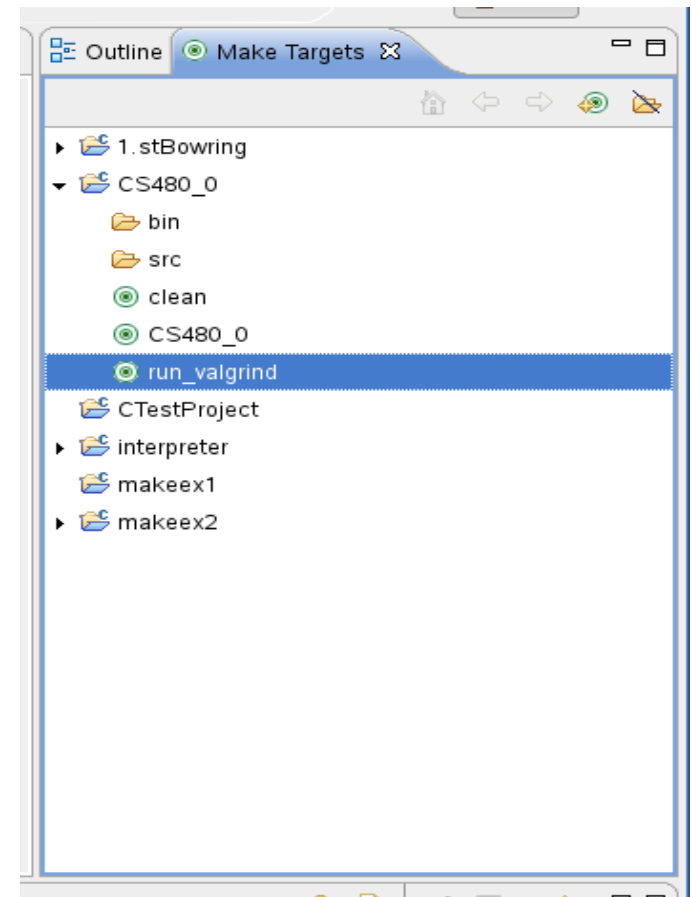
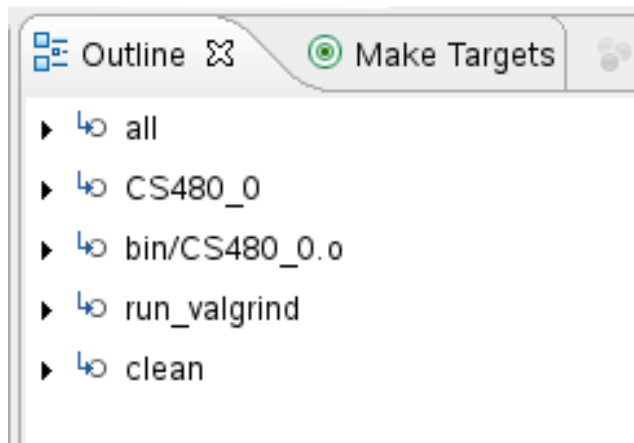
Add Makefile

- File | New | Other | General | File



Add Make Targets

- Open Makefile, write all:, CS480_0:, clean:
- Open Outline on right side
- Right click on name
- “Add make target”
- Click green dot to
invoke make

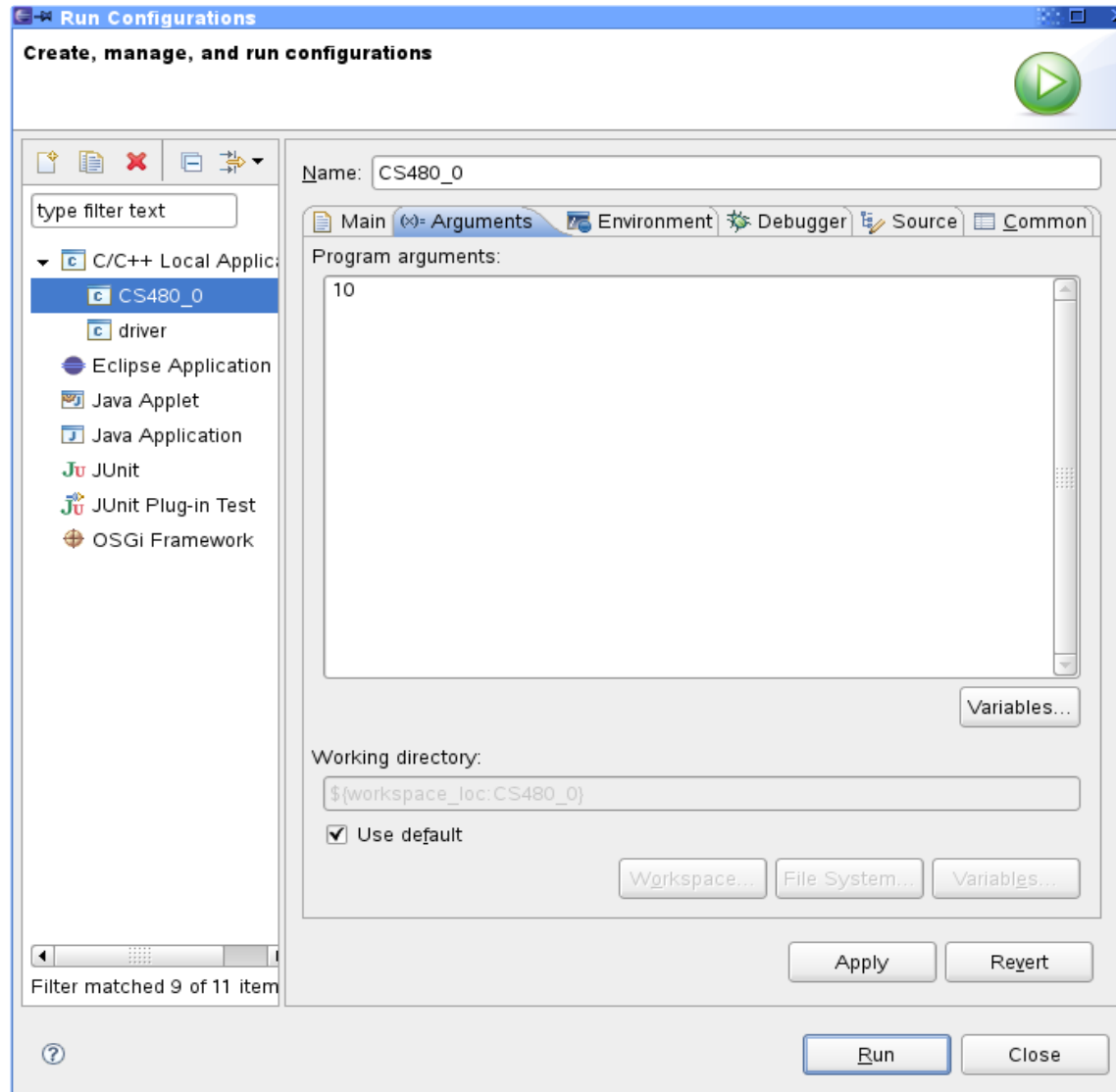


Run Binary

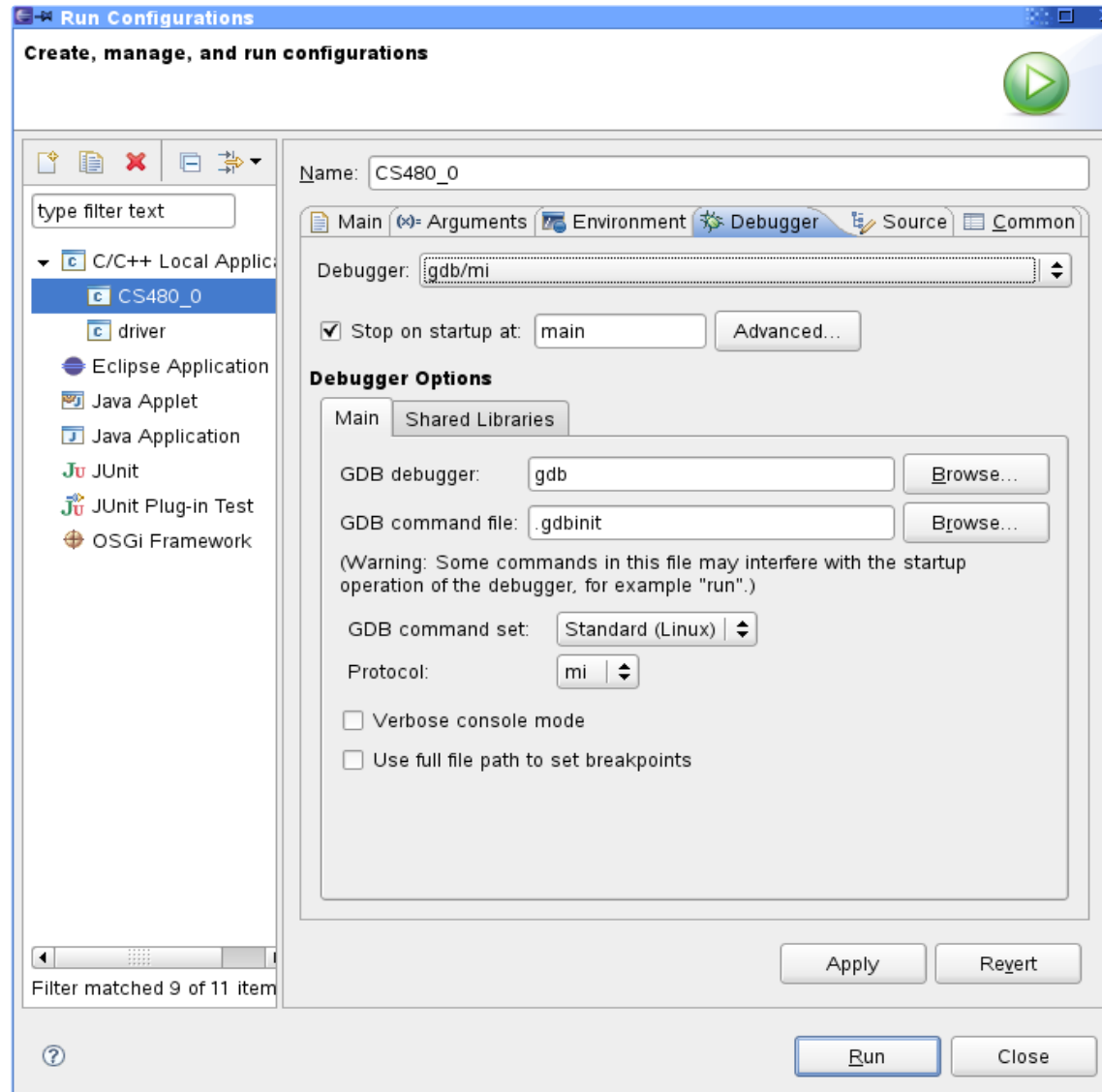
The image shows the Eclipse IDE interface. On the left, a project named 'CS480_0' is selected, and a context menu is open over the 'bin' directory. The menu options include 'New', 'Open', 'Copy', 'Paste', 'Delete', 'Move...', 'Rename...', 'Import...', 'Export...', 'Refresh', 'Exclude from build...', 'Build Configurations', 'Make targets', 'Run As', 'Debug As', 'Clean Selected File(s)', 'Build Selected File(s)', 'Team', 'Compare With', 'Replace With', and 'Properties'. The 'Run As' option is highlighted, and a sub-menu is visible with 'Local C/C++ Application' and 'Run Configurations...'. A red arrow points to the 'Run Configurations...' option.

The 'Run Configurations' dialog is open, showing the configuration for 'CS480_0'. The dialog has tabs for 'Main', 'Arguments', 'Environment', 'Debugger', 'Source', and 'Common'. The 'Name' field is 'CS480_0'. The 'Project' field is 'CS480_0'. The 'C/C++ Application' field is 'bin/CS480_0'. The 'Connect process input_output to a terminal' checkbox is checked. The 'Run' button is highlighted.

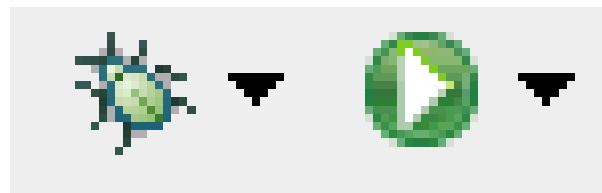
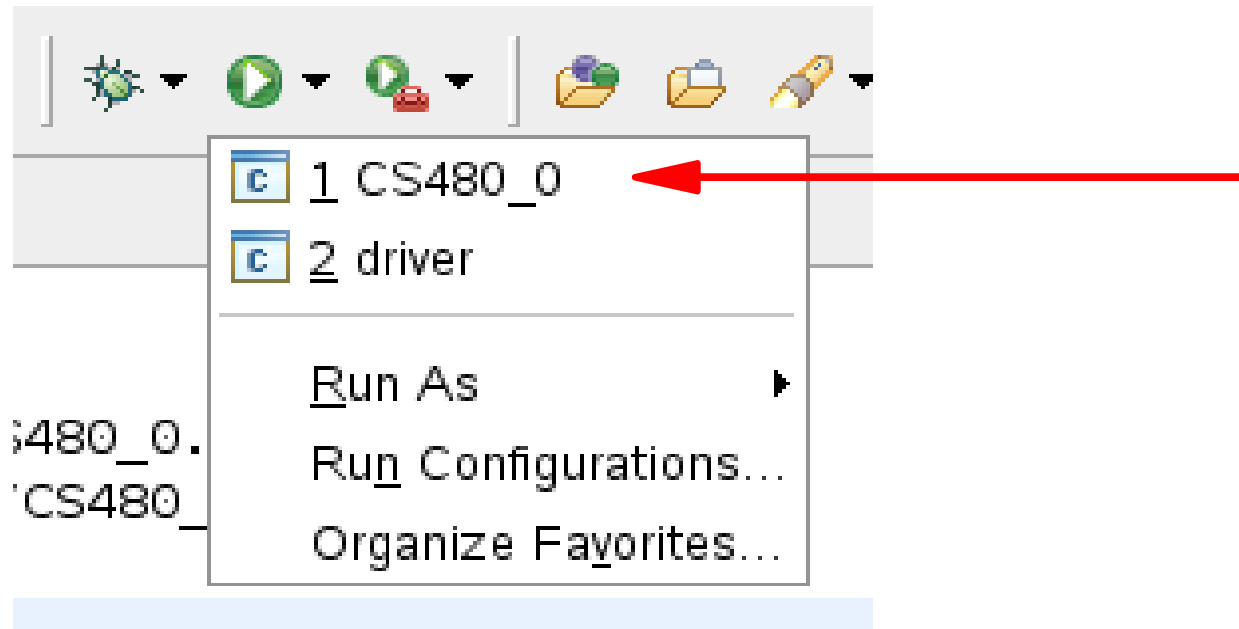
Set command line arguments



Set up debugger



Run Binary (take two)



Debug Run

Printing

- Windows | Preferences
- General | Appearance | Colors and Fonts
- C/C++ | Editor | C/C++ Editor Text Font
 - Use Courier 10 Pitch, Size 8
- This changes the font on the screen!
 - You may want to change back after printing
- Print doubled sided!

Create SVN Repository

```
zeus$ svnadmin create /home/login/SVNREPOS/
```

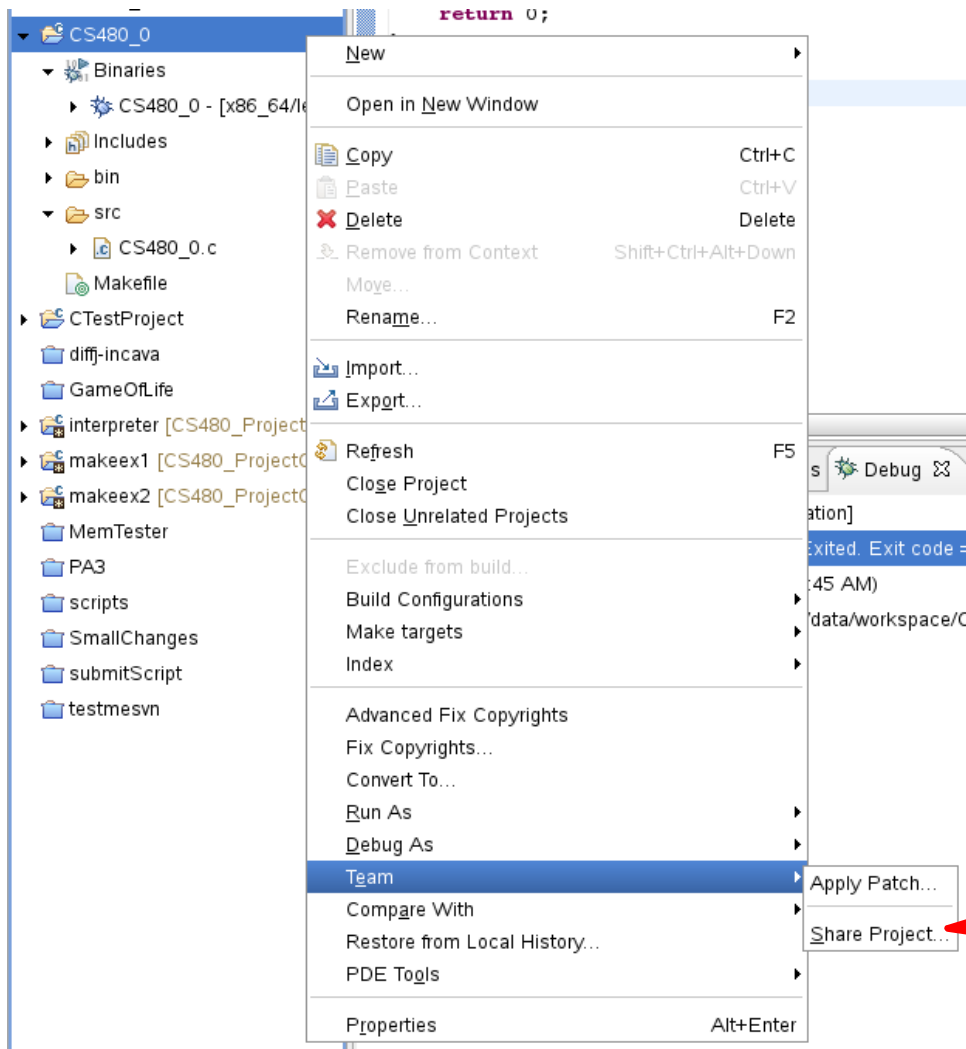
Run **once** on Zeus.

If you have an different repository name (SVNREPOS),
email it to me!

Never touch SVNREPOS again.

Subversion: add to repository

- SVN
- Create New OR
- Use Existing
- Use Project name as folder name



Subversion: Commit Files

- Team | Commit
- What do I commit?
 - Source files
 - Makefiles
 - .cproject / .project
 - Test files
- What do I *not* commit?
 - *.o
 - Binaries
 - Temporary files

Subversion: Update from Repos

- Team | Update
- Team | Synchronize with Repository
 - Shows how files differ from repos
- Revert from bad code
 - Team | Show History
 - “Revert changes from revision ###”
- Team | Compare With
- Team | Replace With

Revert **One File**

- Team | Replace With | Revision
- Copy All Non-Conflicting Changes from Right to Left
- Right click on Workspace File Pane | Save
- Next commit will save the changes to a new revision in the repository

Project Explorer

- 1.stBowing [CS480_ProjectCode/1.stBowing]
 - CS360s07_PA1
 - CS360s07_PA2
 - CS360s07_PA3
 - CS360s07_PA4
 - CS460_Life
 - CS460_PiThread
 - CS460_Shell
- CS480_0 [CS480_0]
 - CTestProject
 - diffj-incava [diffj-incava2]
 - GameOfLife
 - HowDoIRevert [HowDoIRevert]
 - Binaries
 - main - [x86_64/le] 154 2/3/09 10:24 AM c
 - Includes
 - src
 - main.c 158 2/3/09 10:26 AM chadd
 - bin
 - main - [x86_64/le] 154 2/3/09 10:24 AM c
 - main.o - [x86_64/le]
 - Makefile 154 2/3/09 10:24 AM chadd
 - interpreter [CS480_ProjectCode/interpreter]
 - makeex1 [CS480_ProjectCode/makeex1]
 - makeex2 [CS480_ProjectCode/makeex2]
 - MemTester
 - PA3
 - scripts
 - SmallChanges [SmallChanges]
 - submitScript
 - testmesvn

main.c Makefile Compare main.c <workspace> and versions

Structure Compare

Revisio	Merged Revisions	Tags	Date	Author	Comment
*158			2/3/09 10:26 AM	chadd	added funct prototype
157			2/3/09 10:25 AM	chadd	re-added !
156			2/3/09 10:25 AM	chadd	added funct
155			2/3/09 10:24 AM	chadd	added !
154			2/3/09 10:24 AM	chadd	initial source commit

C Compare Viewer

Workspace file: main.c Repository file: main.c

```

void printer(char* ;
int main()
{
    printer("HELLO WORLD!");
}
void printer(char *str)
{
    printf("%s\n", str);
}
  
```

Problems Tasks Console Properties

<terminated> main [C/C++ Local Application] /home/chadd/data/workspace/HowDoIRevert/bin/main (2/3/09 10:28 AM)
HELLO WORLD!

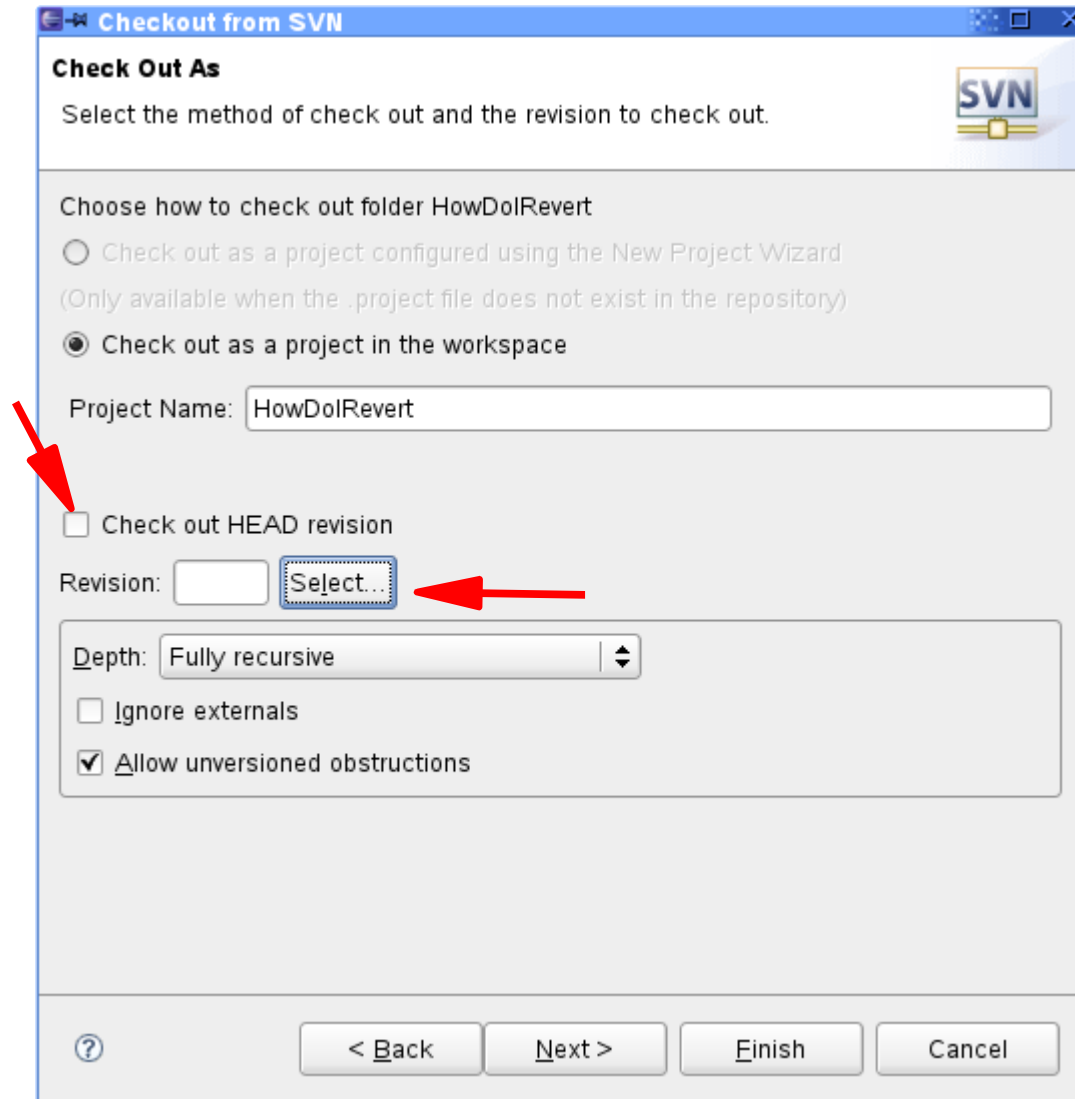
Revert the **Entire Project**

- Rename existing Project
- Right click Project Name | Rename


- Don't worry, from Eclipse, you cannot destroy your SVN Repository
 - Unless you really, really try

Revert the Entire Project


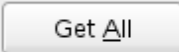

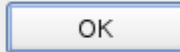
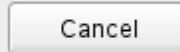
- Check out New Project from SVN
- Don't check out the HEAD
- Select Revision



Resource History - HowDoIRevert

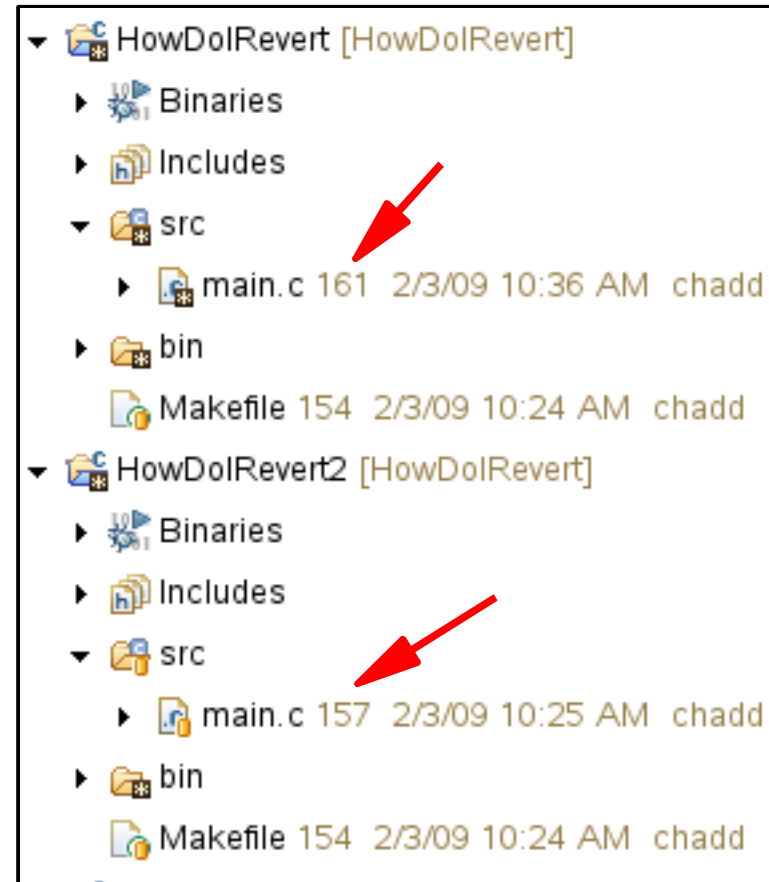
R#	Date	Author	Comment
*161	2/3/09 10:36 AM	chadd	changed func name again! I can't decide!
160	2/3/09 10:36 AM	chadd	change func name
159	2/3/09 10:34 AM	chadd	reverted a bunch of stuff!
158	2/3/09 10:26 AM	chadd	added funct prototype
157	2/3/09 10:25 AM	chadd	re-added ! 
156	2/3/09 10:25 AM	chadd	added funct
155	2/3/09 10:24 AM	chadd	added !
154	2/3/09 10:24 AM	chadd	initial source commit
153	2/3/09 10:23 AM	chadd	Initial import.

Stop on Copy/Rename

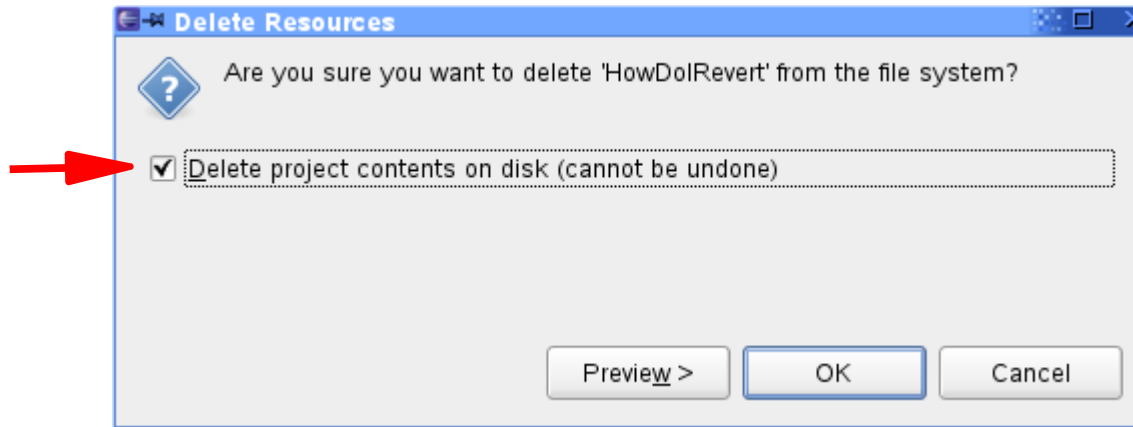
Both Projects

- Project checked out twice
- Different revisions in each project



Delete Old Project

- Not strictly necessary
- Right click on (Old) Project Name | Delete



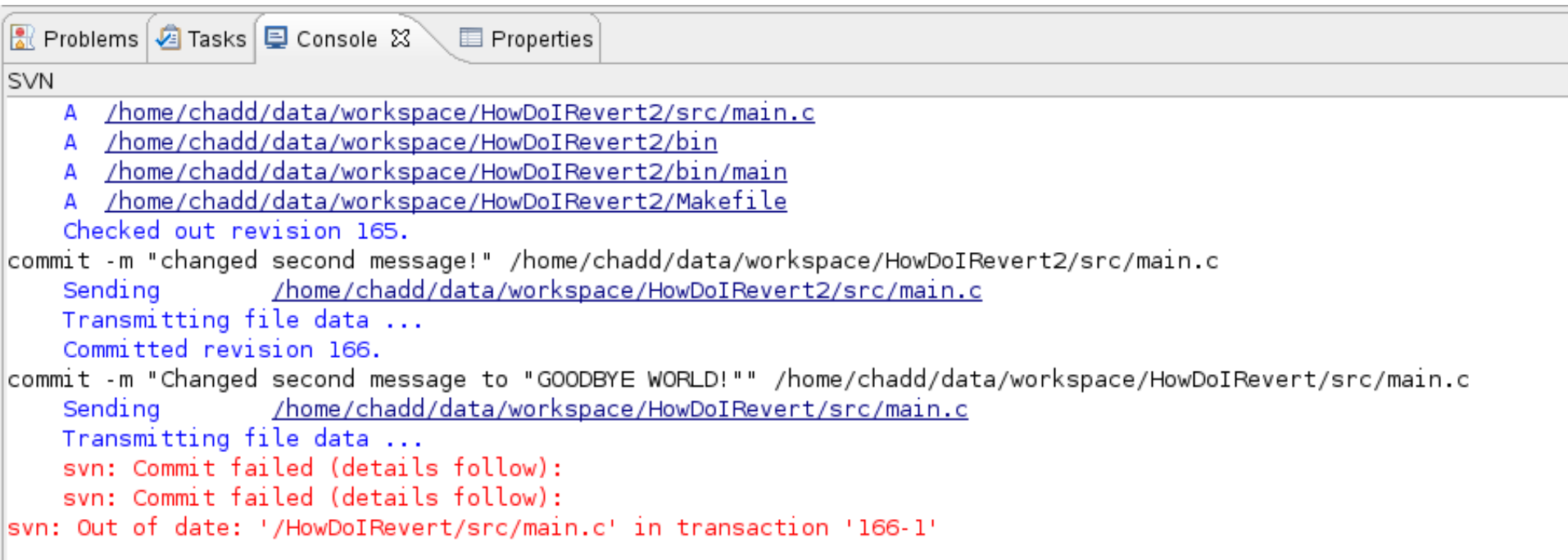
- Make sure you delete Project from disk
 - Does not affect Subversion repository
- Close Eclipse and restart
 - To clean up the workspace

Reverted Project: Commit new Changes

- Update code in project
- Right click Project Name | Team | Synchronize with Repository
- Right click Project Name | Mark as merged
- Go back to C/C++ Perspective
- Right click {File,Project} | Team | Commit

Merge Conflict!

- Changes in the Repository conflict with changes in your local directory



The screenshot shows an IDE interface with tabs for Problems, Tasks, Console, and Properties. The Console tab is active, displaying the following text:

```
SVN
A /home/chadd/data/workspace/HowDoIRevert2/src/main.c
A /home/chadd/data/workspace/HowDoIRevert2/bin
A /home/chadd/data/workspace/HowDoIRevert2/bin/main
A /home/chadd/data/workspace/HowDoIRevert2/Makefile
Checked out revision 165.
commit -m "changed second message!" /home/chadd/data/workspace/HowDoIRevert2/src/main.c
Sending /home/chadd/data/workspace/HowDoIRevert2/src/main.c
Transmitting file data ...
Committed revision 166.
commit -m "Changed second message to "GOODBYE WORLD!"" /home/chadd/data/workspace/HowDoIRevert/src/main.c
Sending /home/chadd/data/workspace/HowDoIRevert/src/main.c
Transmitting file data ...
svn: Commit failed (details follow):
svn: Commit failed (details follow):
svn: Out of date: '/HowDoIRevert/src/main.c' in transaction '166-1'
```


Update!

- Right click file | Team | Update

```
#include <stdio.h>

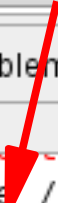
void printer(char *str)
{
    printf("%s\n", str);
}

int main()
{
    printer("HELLO WORLD!");
    <<<<<<< .mine
    printer("GOODBYE WORLD!");
    =====
    printer("GOODBYE!");
    >>>>>>> .r166
}
```



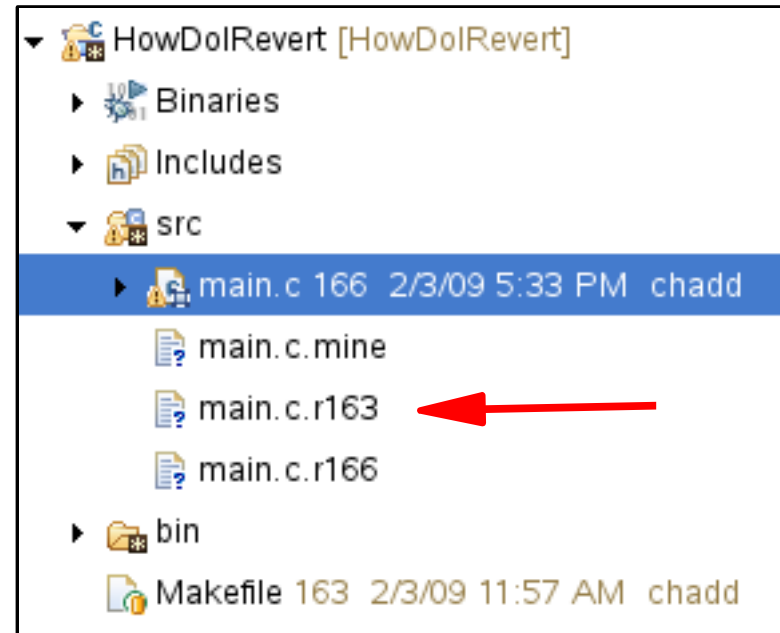
Problems Tasks Console Properties

```
SVN
update /home/chadd/data/workspace/HowDoIRevert/src/main.c -r HEAD --force
C /home/chadd/data/workspace/HowDoIRevert/src/main.c
Updated to revision 166.
==== File Statistics: ====
Conflicts: 1
```



Resolve!

- Edit the source file
main.c
 - Remove <<<<< >>>>>
- Right Click File | Team | Mark Resolved
- Commit



Subversion: Check out

- File | New | Project | SVN | Checkout projects from SVN

- Create new:

```
svn+ssh://zeus/home/login/SVNROOT/CS480_0
```

- **login**: your zeus login
- **CS480_0**: project in repository

Subversion: Check out by hand

```
zeus$ svn co svn+ssh://zeus/home/login/SVNROOT/CS480_0 CS480_0
```

- **login**: your zeus login
- **CS480_0**: project in repository
- **CS480_0**: local directory to create

```
zeus$ cd CS480_0
```

```
zeus$ make
```

```
zeus$ bin/CS480_0 10
```

GCC (compiler)

- `gcc -o example.o -c example.c`
 - `-o` output file
 - `-c` compile only (produce `.o` file)
- `gcc -o example example.o`
 - Use `example.o` to build executable file `example`
 - Run `example`:
 - `zeus$./example`
- `-g` : add debug symbols
- `-Wall` : show all warnings

GCC (extras)

- `gcc --help`
- `gcc -S -o file.asm file.c`
 - dump assembly instructions to *file.asm*
- `gcc -lm file.c -o file`
 - Link against math library (`libm.so`)
 - Link against library `libabc.so`: `-labc`
 - Produce executable *file*

Makefile

```
# Sample makefile      # comment

CC=gcc                 # variable
CFLAGS=-g -Wall

all: driver            # default target

driver: driver.o
    ${CC} ${CFLAGS} -o driver driver.o
driver.o: constants.h driver.c
    ${CC} ${CFLAGS} -o driver.o -c driver.c
clean:
    rm -f core *.o *~
```

Makefiles

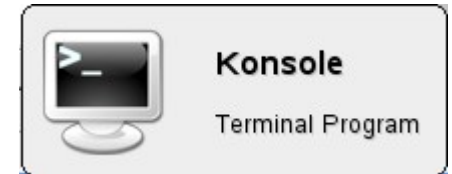
- See `makeex1.tar.gz` and `makeex2.tar.gz`
- Example 2 shows directories being used

Valgrind.org

- <http://valgrind.org/docs/manual/QuickStart.html>
- Memcheck
 - Memory checker
- To run:

```
zeus$ valgrind --leak-check=yes ./CS480_0 10
```
- Look for
 - invalid read/writes
 - uninitialized values
 - illegal frees
 - and more....

Linux Command Line



`ssh` – connect to a remote machine

`scp` – copy file to/from remote machine

`cd` – change directory

`ls` – list files

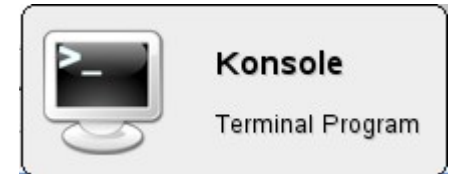
`man` – manual pages

`mkdir` – make a directory

`cp` – copy a file

`tar zxf filename.tar.gz` – explode files

Linux Command Line



`rm` – remove a file

`mv` – move (rename) a file

`more` – display a file

`ps` – list processes

`grep` – search for text in a file

`diff` – compare two file

`kill` – kill a process

`passwd` – change password