CS341L: Computer Architecture

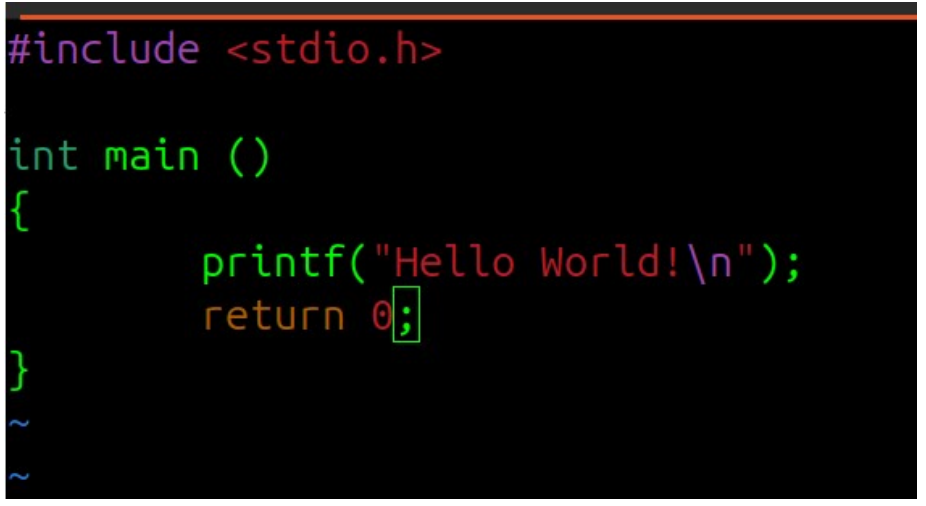
COMPUTER SCIENCE

- Syllabus https://www.unm.edu/~sbruno1/cs341l

CS341L: Linux and Labs

COMPUTER SCIENCE

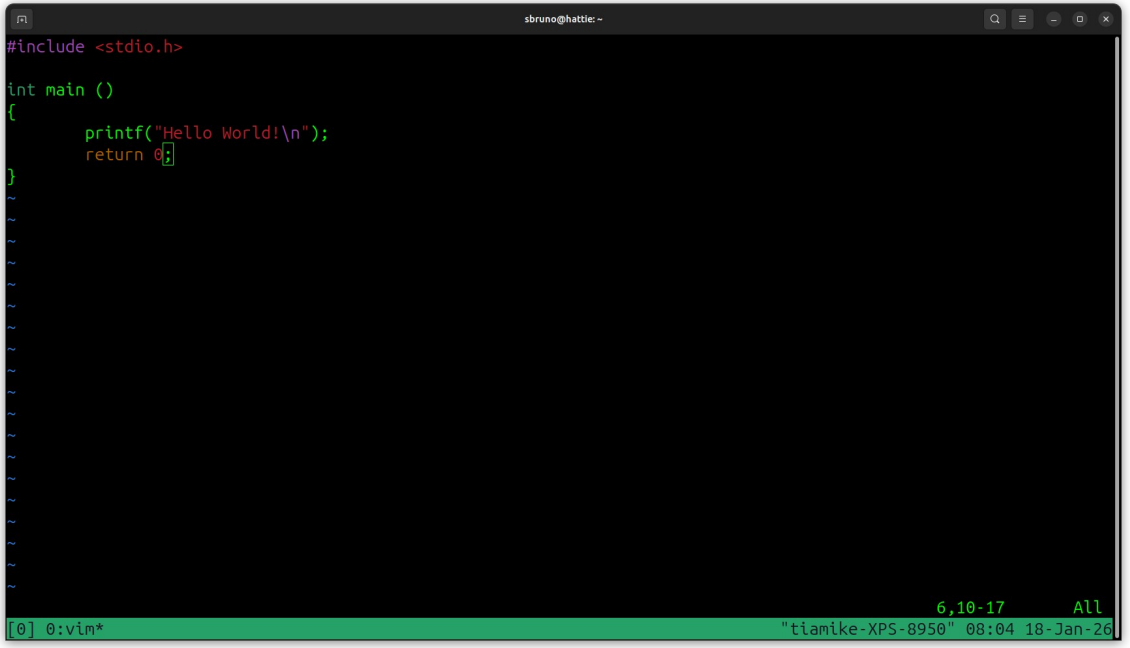
- Terminals
- Editor
- Shells
- Compilers
- Makefiles



CS341L: Terminal

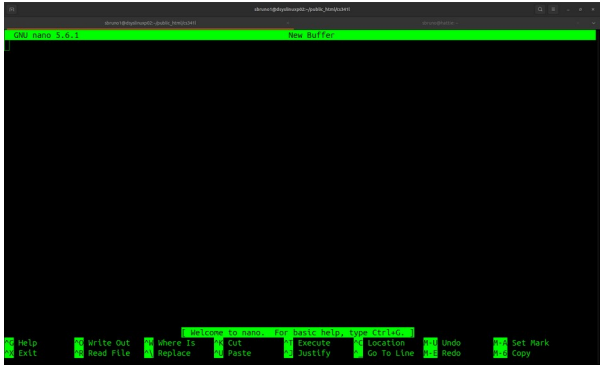
COMPUTER SCIENCE

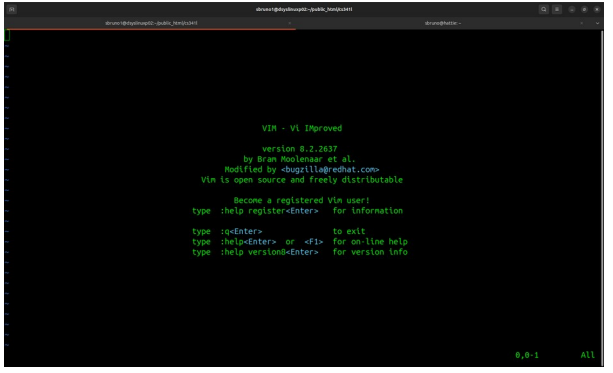
- Gnome Terminal
- Power Shell
- Mac Terminal
- Xterm
- Tmux/Screen
- WSL

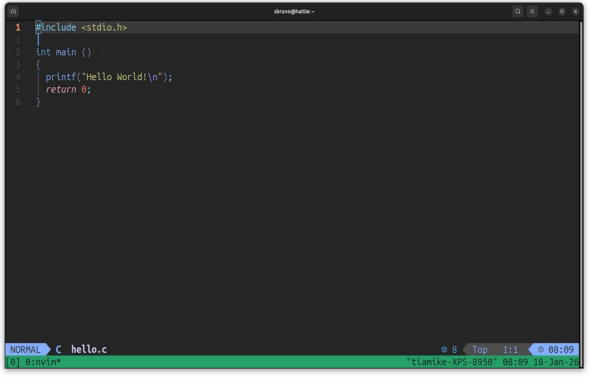


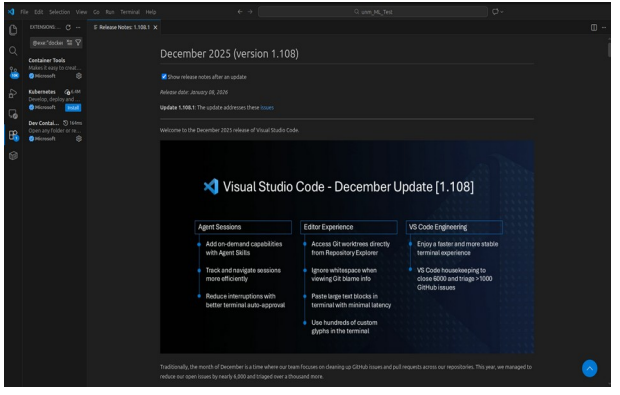
CS341L: Editors

- Nano
- Joe
- VI/VIM
- NeoVim
- VSCode
- Sublime
- EMACS





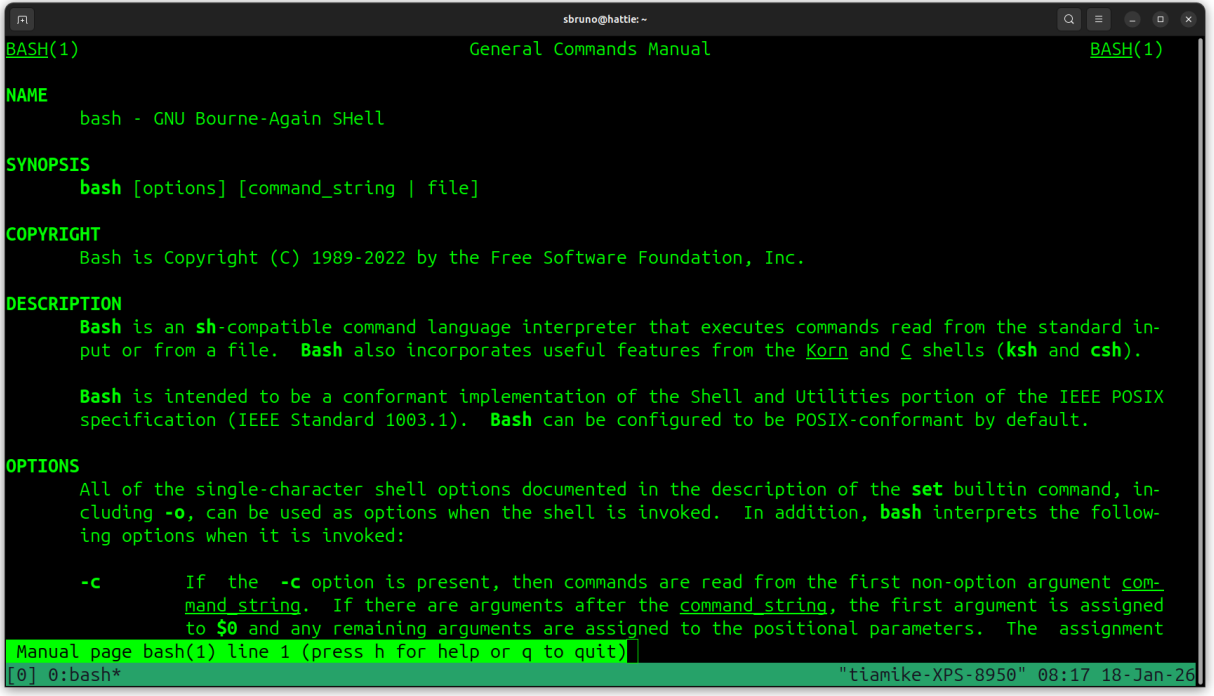




CS341L: Shells and Manual Pages

COMPUTER SCIENCE

- Bash
- ZSH
- KSH
- CSH
- SH



CS341L: Compilers

COMPUTER SCIENCE

- GCC

```
sbruno@hattie:~$ gcc -v
Using built-in specs.
COLLECT_GCC=gcc
COLLECT_LTO_WRAPPER=/usr/libexec/gcc/x86_64-linux-gnu/13/lto-wrapper
OFFLOAD_TARGET_NAMES=nvptx-none:amdgcn-amdhsa
OFFLOAD_TARGET_DEFAULT=1
Target: x86_64-linux-gnu
Configured with: ../src/configure -v --with-pkgversion='Ubuntu 13.3.0-6ubuntu2~24.04' --with-bugurl=file:///usr/share/doc/gcc-13/README.Bugs --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,m2 --prefix=/usr --with-gcc-major-version-only --program-suffix=-13 --program-prefix=x86_64-linux-gnu- --enable-shared --enable-linker-build-id --libexecdir=/usr/libexec --without-included-gettext --enable-threads=posix --libdir=/usr/lib --enable-nls --enable-bootstrap --enable-clocale=gnu --enable-libstdcxx-debug --enable-libstdcxx-time=yes --with-default-libstdcxx-abi=new --enable-libstdcxx-backtrace --enable-gnu-unique-object --disable-vtable-verify --enable-plugin --enable-default-pie --with-system-zlib --enable-libphobos-checking=release --with-target-system-zlib=auto --enable-objc-gc=auto --enable-multiarch --disable-werror --enable-cet --with-arch-32=i686 --with-abi=m64 --with-multilib-list=m32,m64,mx32 --enable-multilib --with-tune=generic --enable-offload-targets=nvptx-none=/build/gcc-13-fG75Ri/gcc-13-13.3.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-13-fG75Ri/gcc-13-13.3.0/debian/tmp-gcn/usr --enable-offload-defaulted --without-cuda-driver --enable-checking=release --build=x86_64-linux-gnu --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-build-config=bootstrap-lto-lean --enable-link-serialization=2
Thread model: posix
Supported LTO compression algorithms: zlib zstd
gcc version 13.3.0 (Ubuntu 13.3.0-6ubuntu2~24.04)
```

- CLANG/LLVM

```
sbruno@hattie:~$ gcc hello.c -o hello_gcc
sbruno@hattie:~$ clang hello.c -o hello_clang
sbruno@hattie:~$ ls -l hello_clang hello_gcc
-rwxrwxr-x 1 sbruno sbruno 16008 Jan 18 08:24 hello_clang
-rwxrwxr-x 1 sbruno sbruno 15960 Jan 18 08:23 hello_gcc
sbruno@hattie:~$
```

CS341L: Makefiles

COMPUTER SCIENCE

- Makefile structure
- Variables
- Targets
- PHONY Targets

```
CC=gcc

SOURCE=hello.c

PROGRAM=hello

${PROGRAM}: ${SOURCE}
  ${CC} ${SOURCE} -o ${PROGRAM}

.PHONY: clean

clean:
  rm ${PROGRAM}
~
```