Just enough “vi”

“vi” is the main interactive editor in the UNIX operating system. Since it usually comes standard with the operating system, you can depend on it being available. Furthermore, the older “ed” editor is a near subset. Also, one of the command line edit modes of “ksh” is “vi”.

A Brown Bag seminar

No registration. No cost. Just come.

Curia II, Monday, April 19, 1993, Noon

bring lunch, if you please

Announcement

Just enough “vi”
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Fermilab

Just enough “vi”

“vi” is the main interactive editor in the UNIX operating system. Since it usually comes standard with the operating system, you can depend on it being available. Furthermore, the older “ed” editor is a near subset. Also, one of the command line edit modes of “ksh” is “vi”.

Just enough “vi”
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510
Copyright February 1, 1993, Universities Research Associates, Inc.

Fermilab

Contents

Section	Description
Title	Seminar title.
Contents	Contents.
Ground Rules	Ground Rules.
Conventions	Symbolism used in this presentation.
First Aid	How to “Undo” and “Get Out”.
Operating Modes	Command vs. Input; Screen vs. Line.
Minimalist vi	A very small, but still usable, subset
Screen Commands	Movement and changes in Screen Mode
Line Commands	Movement and changes in Line Mode
Tips and Tricks	Tips and Tricks
Attractions	Possible coming attractions.
Survey	Seminar survey.

Just enough “vi”
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Fermilab

Ground Rules

- I expect and want questions. Raise your hand!
- I expect and want suggestions for future short courses like this course. Please, submit them after class.
- These courses are **not** tailored to a specific version of the UNIX operating system or shell program.
- This seminar is not intended to be a complete discussion.
- The reference materials in the handouts cover more.

- **Let us stay on the topic so we can be done on time.**

- Comments can be given to me in person directly after class, mailed to M/S 234 WH6W or e-mailed to HERBER on on the main FNALV DEC VAX cluster.

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Symbolisms used

- An ESCAPE character is a Control-[.
  I will refer to this character in the future as **esc**.
- A carriage return or ENTER character will be **cr**.
- What you should type will be shown in quotes, “…”.

(more)

Just enough “vi”
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

First Aid

Part 1 of 5

- If your terminal does not have an **ESCAPE** key, you need to know how to make it. An ESCAPE character is a Control-[.

- If everything just goes on the screen and does not do anything, you are mostly likely in INPUT mode. An esc should get you into COMMAND mode.

- If you give too many escs, the screen will flash or the terminal will "beep". (You did leave the "beep" on, didn't you?)
- If the flashing bothers you, "**`:set noflash`**cr" should help.
- If the beeping bothers you, "**`:set flash`**cr" should help.

- The command, in COMMAND mode, to quit without writing anything is: "**`:q!`**cr".

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

First Aid

Part 2 of 5

- If you have just made a mistake and want to undo it,
  if necessary, get into command mode with an **esc**, then
  in any case, do a "**u**".
  This will undo just about any one single command's worth of
  changes; even "**:1,$d**cr" - delete all lines.

- If you have just made a number of changes on a single line and
  have not moved off the line at any time, this too is fixable,
  If necessary, get into command mode with an **esc**, then
  in any case, do a "**U**".

- Of course, a "undo" of "**u**" type will undo an
  immediately previous "undo" of the either type!

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

First Aid

Part 3 of 5

- What if the system crashes during a long edit, you ask? Usually, this is not a large problem. The file is not rewritten until you write it back; so the original version is still OK. And, a “vi -r filename” will usually recover all or almost all of your changes as the editor logs the current state of your work as you go along. As long as system recovery does not remove the log files, your work is safe.

  Replace the “filename” with the name of your file.

(more)

Just enough “vi”
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

First Aid

Part 4 of 5

- Some problems appear to be with **vi** and are not!
  - **vi** does not know your terminal type or how to handle it.

    If you see a message about:

    `Visual needs addressable cursor or upline capability`, **`[open mode]`**, **`Bad termcap entry`**, **`Unknown terminal type`**, **`Block device required`** or **`Not a typewriter`**,

    get out with a "**`:q!`**cr".

    Check your TERM environment variable with a "**`echo $TERM`**cr".
  - **vi** is for text files and if you ask it to handle something else,

    you will see a message about:

    `Bad file number`, **`Block special file`**, **`Character special file`**, **`Executable`** or **`Non-ascii file`**,

    get out with a "**`:q!`**cr".

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

First Aid

Part 5 of 5

- You may have trouble writing or quitting from **vi**. There are more forceful versions of both the `:w` and `:q` commands. These are "`:w!` ...cr" and "`:q!`cr".
  - "`:q!`cr" means terminate **immediately** and do not write any files.
  - "`:w!` ...cr" means try to write anyway. If the operating system will permit the writing operation, it will occur.

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Operating Modes

Part 1 of 4

- "vi" is a moded editor. This means that the same keys do different things dependent on the mode of the editor.

- One choice of modes is between input mode and command mode.
  - Switching to command mode from input mode is done with an **esc**.
  - Switching to input mode from command mode is done with a variety of command characters. Some of the more useful:

    "**i**" insert text immediately before the cursored character.

    "**a**" insert text immediately after the cursored character.

    "**O**" insert text on a new line immediately above the current line.

    "**o**" insert text on a new line immediately below the current line.

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Operating Modes

Part 2 of 4

- The other choice of modes is between line mode and screen mode.
  The switching of these modes always occurs while in command mode.
  - "**:**" switches the editor to line mode for a single command.
    The cursor moves to the bottom of the screen and a "**:**" is displayed.
    Enter the desired line mode command after the "**:**"
    and terminate it with a "cr".
  - "**Q**" switches the editor to line mode until switched back.
  - "**vi**cr" in line mode, switches the editor back to screen mode.

✍ More firstaid! You may accidently give the editor a Q when in command mode. One such way comes from a common way of ending the editor: ":qcr". If your timing is off on the shift key, you can get ";Qcr" instead! If this happens, just do a "**q**cr". The editor will supply the ":". The ";" and the cr will not do any harm to the file.

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Operating Modes

Part 3 of 4

- Deletions are usually done in command mode, insertions are usually done in input mode, and input, output and termination are always done in line mode (either single-line or switched), you will need to know about, use and exit all of the editor's modes, even if you do not regularly use all the modes.

- There is a summary of the commands for mode switching on the next page.

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Operating Modes

Part 4 of 4

- Between the firstaid section and this sections, all the main methods for switching modes have been mentioned.
  - "**esc**" to go from screen input to screen command.
  - "**i**", "**a**", "**I**", "**A**", "**O**", "**o**", "**c**m", "**C**" and "**R**", to go from screen input to screen command.
  - "**Q**" to go from screen command to multiple line.
  - "**:**" to go from screen command to single line.
  - "**vi**cr" to go from multiple line to screen command.
  - "**i**cr", "**a**cr" or "**.,.c**cr", to go from multiple line command to multiple line input.
  - "**.**cr" to go from multiple line input to multiple line command.

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Just barely enough vi

Part 1 of 5

- Commands that operate over a range will operate on a single complete line by doubling the command character, e.g. "**`cc`**".

- A **movement** is in terms of either lines or characters.
  A **range** is from the current cursor position to the new position that results from a **movement**.

- A **range** is in terms of either lines or characters.
  If the **movement** is in terms of lines, the **range** is also.
  If the **movement** is in terms of characters, the **range** is also.
  The end of a character range away from the cursor will be marked by a **`$`**, regardless of the direction.

- When used with the delete or change commands, movement to the next word (**`w`**) is treated as if it were movement to the end of the word (**`e`**).

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Just barely enough vi

Part 2 of 5

- The command character for changing a range of material is **c**.
  - Therefore, the command to change the line the cursor is on is:

    cc...esc.
  - And, therefore, the command to change a word starting with the cursor:

    cw...esc.
  - Since a change is a single operation combining the deletion of the current material and the insertion of new material, the complete operation looks like "**cw**...esc".

- The command character for deleting the character under the cursor is **x**. The characters to the right move left.

- The command character for deleting a range of material is **d**.
  - Therefore, the command to delete the line the cursor is on is:

    dd.
  - And, therefore, the command to delete a word starting with the cursor:

    dw.

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Just barely enough vi

Part 3 of 5

- Repeating some material from the **operating modes** section:
  - Switching to input mode from command mode is done with an variety of command characters. Some of the more useful:
    - "**i**" insert text immediately before the cursored character.
    - "**a**" insert text immediately after the cursored character.
    - "**O**" insert text on a new line immediately above the current line.
    - "**o**" insert text on a new line immediately below the current line.
  - All these operations are terminated with an **esc**.

- The command for writing the file, with the single line mode prefix, is "**:w**cr".

- The command for terminating the editor, with the single line mode prefix, is "**:q**cr".

- These can be combined as: "**:wq**cr".

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Just barely enough vi

Part 4 of 5

- Moving around in screen command mode (these are case sensitive):

"**h**"	move left one character
"**j**"	move down one line
"**k**"	move up one line
"**l**"	move right one character
"**e**"	move right to the end of the current word
"**w**"	move right one word
"**b**"	move left one word
"**0**"	move to the beginning of line
"**^**"	move to the first visible text on line
"**$**"	move to the end of line

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Just barely enough vi

Part 5 of 5

- Moving around in screen command mode (these are case sensitive):

  "**#G**" move to line # of file; line 1: beginning of the file

  "**G**" move to end of the file at beginning of the line.

  "**/re⏎**" search forward in file for **r**egular **e**xpression

  "**?re⏎**" search backward in file for **r**egular **e**xpression

  "**n**" repeat search in current direction

  "**N**" repeat search in opposite direction

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

About Screen Mode Commands

Part 1 of 2

Most command and movement characters can be preceeded by a positive integer.

In most cases, the immediately following character's operations is repeated the specified number of times as a single operation.

A few command characters may do something else with the number, e.g. **G**, or may simply ignore the number, e.g. **~**.

To cancel a unwanted or incorrect number before entering a command or movement character, enter **esc** instead of the command character.
A delete character or a backspace character will not work, with surprising results.

There are commands for marking up to 26 places in a file. These positions can be used to create movements (and thereby ranges) or in line-mode commands.

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

About Screen Mode Commands

Part 2 of 2

Material can be deleted or copied into 26 named buffers and 9 numbered buffers. The named buffers are managed by the user. These buffers are named by single lower-case letters. The numbered buffers are managed by the editor program; each delete (**d**) or copy (**y**) (yank) pushes the previous material to the next higher numbered buffer. The numbered buffers are named by single digits, 1 through 9.

Material from these buffers can be placed either before or after the cursor. If the deletion or copy was done on a character basis, the insertion is on a character basis; otherwise, if the deletion or copy was on a line basis, the insertion is on a line basis.

Abbreviations are supported for both strings of commands and for text insertion. There are line-mode commands to both define and undefine both types of abbreviation.

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Some screen commands

Part 1 of 2

"**.**"	repeat the last command-mode edit command at the cursor.
"**f**x"	scan forward in current line for character "x".
"**F**x"	scan backwards in current line for character "x".
"**t**x"	scan forward in current line for character "x". Place cursor on character before target character.
"**T**x"	scan backwards in current line for character "x". Place cursor on character after target character.
"**;**"	repeat the last on-the-line scan from the cursor position.
"**,**"	repeat the last on-the-line scan from the cursor position in the reverse direction.
"**^G**"	control-g displays the current line number
"**#G**"	Go to line number #. 1 is first line. 'No number' is last line.

(more)

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Some screen commands

Part 2 of 2

"**!**m"	'm' specifies a movement giving a range. The indicated lines are piped into a filter program. The standard output of that filter program replaces the lines. This can be used to sort or reformat a range of lines.
"**#|**"	Move the cursor to column **#** on the current line.
"**x**"	Delete the character under the cursor.
"**X**"	Delete the character to the left of the cursor.
"**rx**"	Replace the character under the cursor with **x**.
"**R...**esc"	Overwrite characters starting with the character under the cursor with **...** until terminated with esc.
"**mx**"	Note the cursor position with the tag **x**.
"**'x**"	Place the cursor at the position with the tag **x**.
"**'x**"	Place the cursor at first visible text on the line marked with the tag **x**. The tag can be any lower case letter from "a" to "z". Tags are associated with a specific line until the line is deleted or the edit session is terminated.

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Some line commands

"**:'a,'bd**cr"	Delete the lines starting with the tag **a** and ending with the tag **b**. The tag definitions are deleted also.
"**:'a,'bm.**cr"	Move the lines starting with the tag **a** and ending with the tag **b** after the current line. The tag definitions move with the moved lines.
"**:'a,.t't**cr"	Copy the lines starting with the tag **a** and ending with the current line after the line with tag **t**. The tag definitions stay with the original lines.
"**:'a,'bw %.p1**cr"	Write the lines starting with the tag **a** and ending with the tag **b** into a file named the same as the current file with **.p1** appended.
"**:'ar fred**cr"	Read the file **fred** after line with the tag **a**.
"**:g/re/p**cr"	"grep" lines containing the regular expression, **re** and display them.
"**:%s/re/sub/g**cr"	Throughout the file (**%** implies the entire file), replace all occurances of the regular expression, **re**, with the meaning of the substitution expression, **sub**.

Line

Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Fermilab

Various tricks and techniques

- To tranpose two characters:
  - Place the cursor on the left character.
  - Do “**xp**”.

- To tranpose two words:
  - Place the cursor on the space before the first word line.
  - Do “**deep**”.

- To tranpose two lines:
  - Place the cursor on the top line.
  - Do “**ddp**”.

(more)

Just enough “vi”
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Various tricks and techniques

- How to find last change:
  - Do "**uu**".
- To delete all lines that are null or blank:
  - Do "**:g/^[space tab]*$/d cr**".
- To put a marker before all non-blank lines:
  - Do "**:v/^[space tab]*$/s/^/>/ cr**".

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Possible coming attractions

- Shell quoting
- How to do arithmetic in shell scripts
- Why my dusty FORTRAN deck does not work anymore.
- How to read man pages
- How to use fork(), exec(), open(), close(), dup() and pipe()
- How the operating system finds files and data in them
- What does a child inherit from its parent?
- What is a “zombie”? What is makes an unkillable process?
- sed
- perl
- How to write better FORTRAN code

Just enough “vi”
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Send to: Randolph Herber, WH6W, M/S 234

Your name _____

Your e-mail address _____

Your telephone number _____

	Excellent	Fair	Neutral	Poor	Failed	Your comment
Class useful	☐	☐	☐	☐	☐	_____
Instructor understandable	☐	☐	☐	☐	☐	_____
Viewgraphs readable	☐	☐	☐	☐	☐	_____

	Too high	High	OK	Low	Too low	Your comment
Presentation speed	☐	☐	☐	☐	☐	_____
Level of material	☐	☐	☐	☐	☐	_____

Your 1st choice topic _____

Your 2nd choice topic _____

Your 3rd choice topic _____

Class evaluation

Just enough "vi"
Randolph J. Herber, herber@fnalv.fnal.gov, 1 708 840 2966
Computing Division/Distributed Computing Department/Special Projects
P.O. Box 500, Mail Stop 234 (WH6W), Batavia, IL 60510

Fermilab