Introduction to Vim, II

EE231002 Introduction to Programming

TA 胡恩典

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Moving Cursor

- `vim` use keyboard as the input device for better efficiency
- In normal mode, one can use `h`, `j`, `k`, and `l` to move cursor
  - `h`=←, `j`=↓, `k`=↑, `l`=→
- One can also use the following normal mode command to go to line number `n` directly
  - `:n`: go to line `n`, `n` is an integer
  - This is especially useful for debugging

Copy and Paste

- In normal mode, one can copy one line or multiple lines into the buffer
  - `yy` : copy the current line into the buffer
  - `nyy` : copy `n` lines, starting from the current line, into the buffer (`n` is an integer)
  - `y` : copy the words you have selected into the buffer
- The content of the buffer can be pasted by `p`
  - The content of the buffer will be pasted following the current line if the content of the buffer is a line
  - The content of the buffer will be pasted following the cursor if the content of the buffer is the words selected

Delete

- In normal mode, the following are delete commands
  - `dd`: delete the current line and place it into the buffer
  - `ndd`: delete `n` lines, starting from the current line, and place it into the buffer
  - `D`: delete to the end of the line (from the cursor position) and place the content into the buffer
  - `dw`: delete the current word and place it into the buffer
- The content of the buffer can be pasted at the current position using
  - `p`: paste the content of the buffer at the current position.

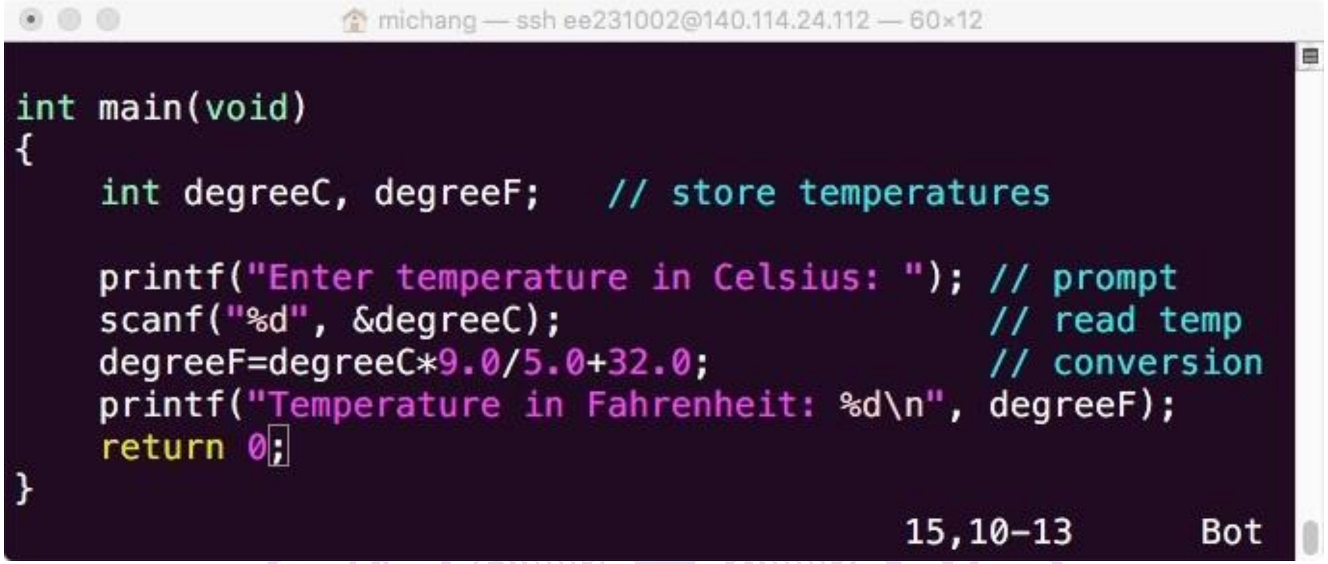
Undo, Redo, and Repeat Command

- In normal mode, delete (and other commands) can be `undo` by
  - `u`: undo command
- After undo, the original operation can be redone by
  - `Ctl-r`: redo command
- In normal mode, the same command can be repeated by
  - `.`: repeat command

Search for a Word

- In normal mode, one can search for a `word` by
  - `/word`: searches for tkbword
  - The cursor will be placed at the first `word` after the cursor.
  - To search for the next `word` use command
  - `n`: searches for the next `word`
  - To search for the previous `word` use command
  - `N`: searches for the previous `word`
- Note that `/word` searches the first `word` after the cursor, to search for the previous `work` use the following command
  - `?word`: search for the previous `word` before the cursor position
- Note that after searching command, all `word` will be highlighted
  - To turn off highlight, use the following command
  - `:noh`: turn off highlights

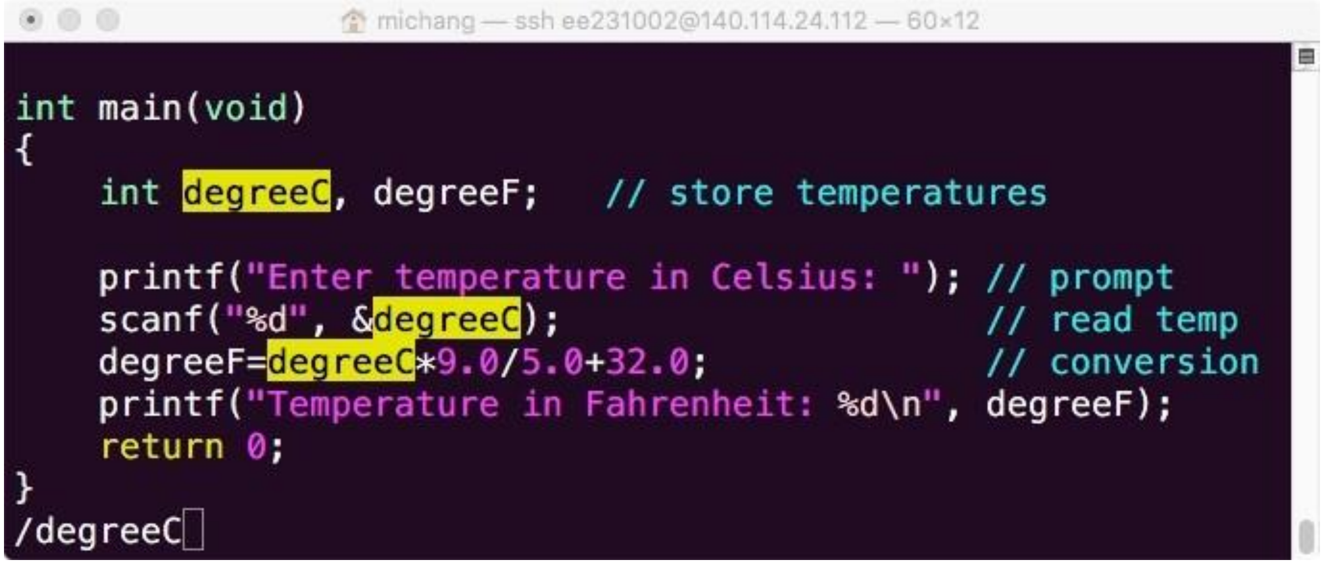
Search Example



michang — ssh ee231002@140.114.24.112 — 60×12

```
int main(void)
{
    int degreeC, degreeF;   // store temperatures

    printf("Enter temperature in Celsius: "); // prompt
    scanf("%d", &degreeC);                    // read temp
    degreeF=degreeC*9.0/5.0+32.0;             // conversion
    printf("Temperature in Fahrenheit: %d\n", degreeF);
    return 0;
}
                                     15,10-13       Bot
```

- Search for `degreeC`



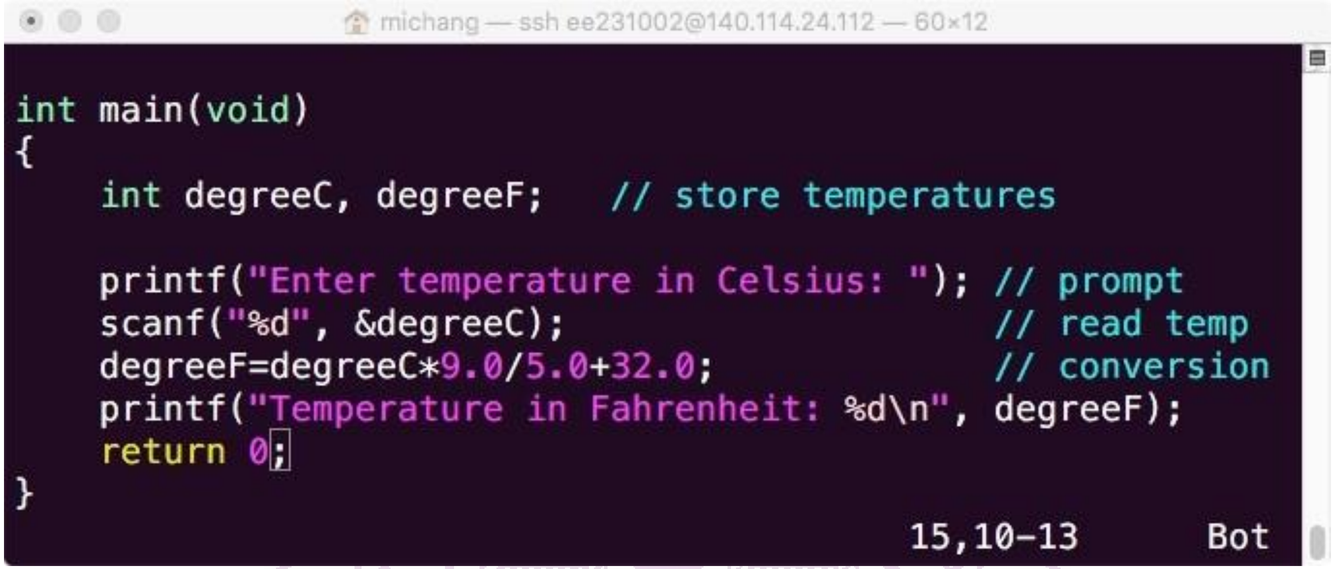
michang — ssh ee231002@140.114.24.112 — 60×12

```
int main(void)
{
    int degreeC, degreeF;   // store temperatures

    printf("Enter temperature in Celsius: "); // prompt
    scanf("%d", &degreeC);                    // read temp
    degreeF=degreeC*9.0/5.0+32.0;             // conversion
    printf("Temperature in Fahrenheit: %d\n", degreeF);
    return 0;
}
/degreeC
```

Substitute a Word

- In normal mode, one can substitute word1 by word2 by
  - `:0,$s/word1/word2/g`
  - This command replaces all occurrences of word1 by word2
  - `:m,ns/word1/word2/cgi`
  - This command replaces word1 by word2 from line m to n
    - `c`: confirmation
    - `g`: all occurrence, not the first one of each line
    - `i`: case insensitive

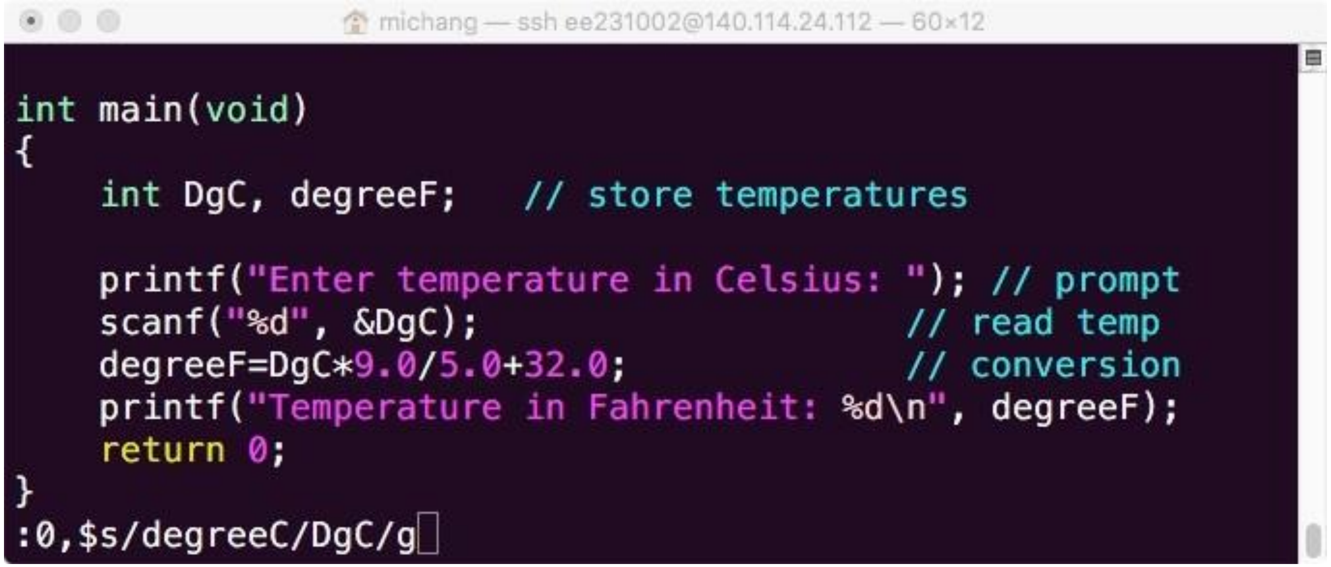
Substitute Example



michang — ssh ee231002@140.114.24.112 — 60×12

```
int main(void)
{
    int degreeC, degreeF;   // store temperatures

    printf("Enter temperature in Celsius: "); // prompt
    scanf("%d", &degreeC);                    // read temp
    degreeF=degreeC*9.0/5.0+32.0;             // conversion
    printf("Temperature in Fahrenheit: %d\n", degreeF);
    return 0;
}
                                          15,10-13      Bot
```

- Substitute degreeC by DgC

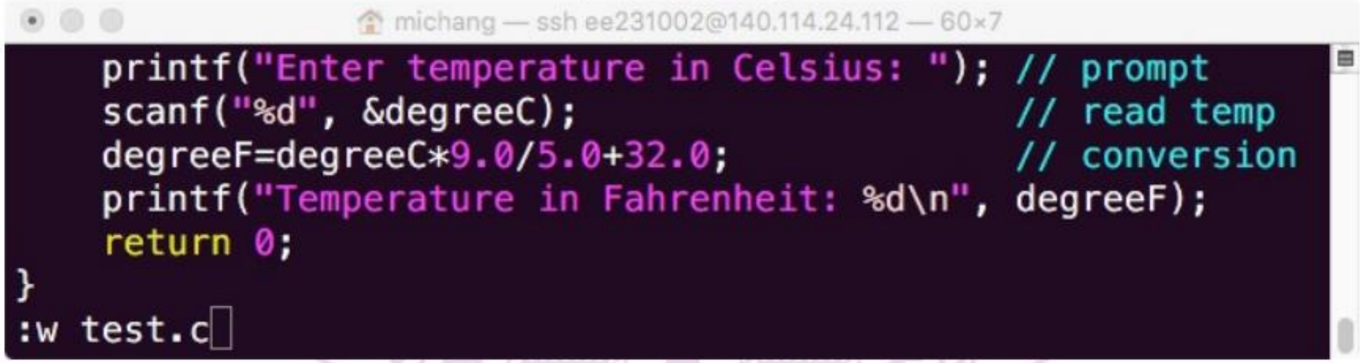


michang — ssh ee231002@140.114.24.112 — 60×12

```
int main(void)
{
    int DgC, degreeF;   // store temperatures

    printf("Enter temperature in Celsius: "); // prompt
    scanf("%d", &DgC);                    // read temp
    degreeF=DgC*9.0/5.0+32.0;             // conversion
    printf("Temperature in Fahrenheit: %d\n", degreeF);
    return 0;
}
:0,$s/degreeC/DgC/g
```

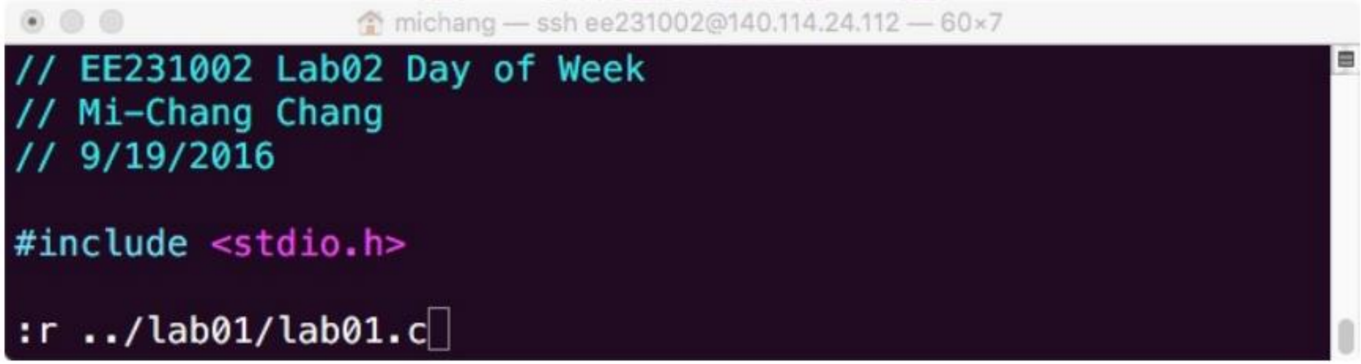
Read and Write

- In normal mode, the file can be saved to a different name
  - `:w filename`: save to `filename` file



```
    printf("Enter temperature in Celsius: "); // prompt
    scanf("%d", &degreeC);                    // read temp
    degreeF=degreeC*9.0/5.0+32.0;             // conversion
    printf("Temperature in Fahrenheit: %d\n", degreeF);
    return 0;
}
:w test.c
```

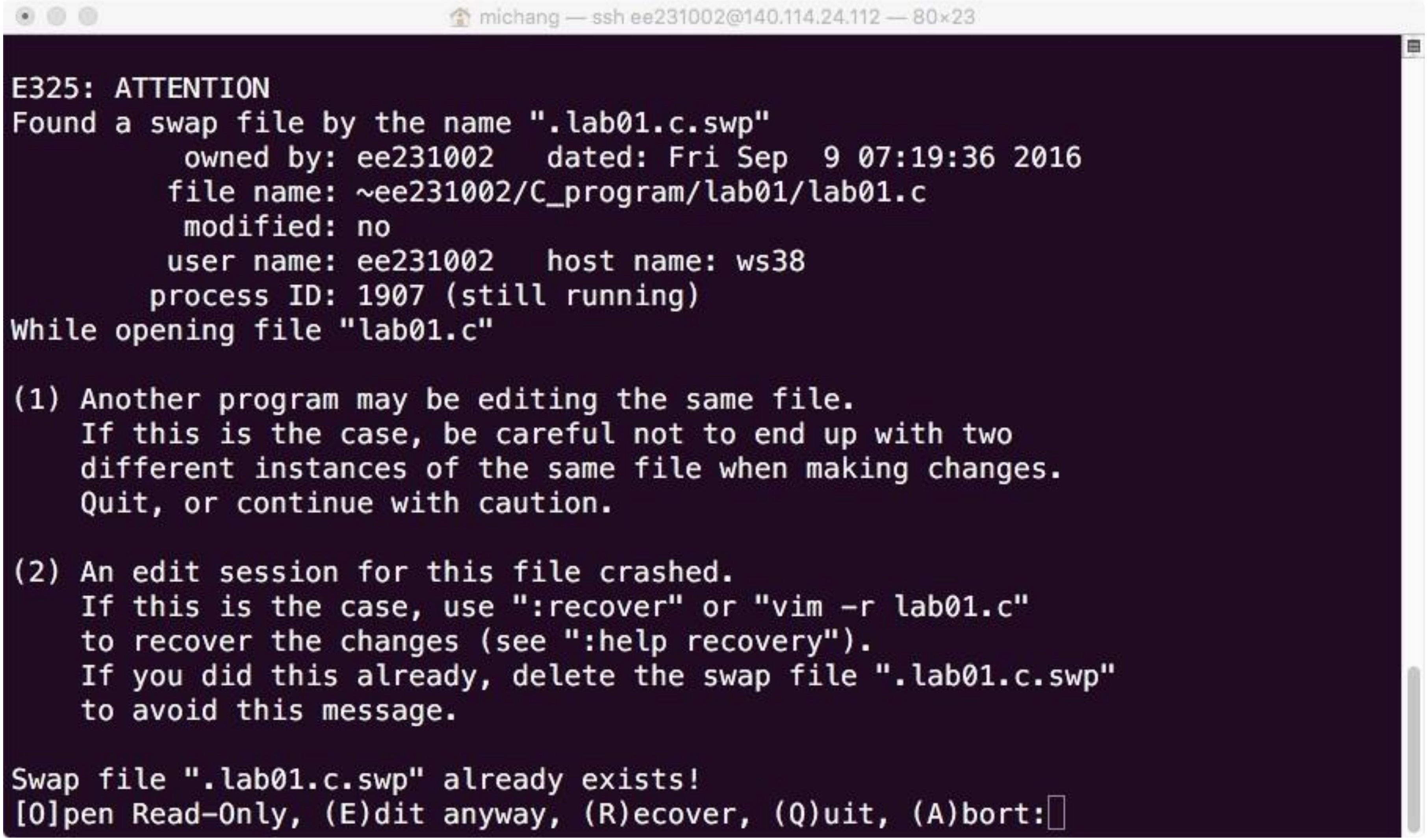
- One can also read in other file's content and place after current line
  - `:r filename`: read `filename`



```
// EE231002 Lab02 Day of Week
// Mi-Chang Chang
// 9/19/2016

#include <stdio.h>

:r ../lab01/lab01.c
```

Swap File Error Example

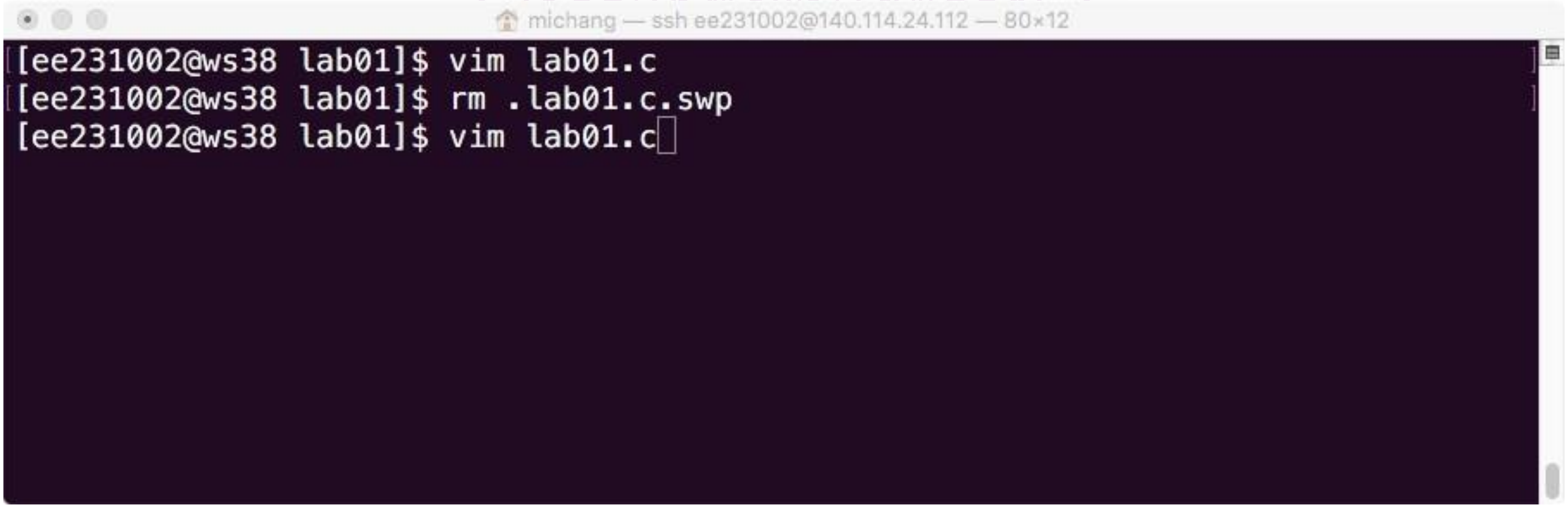
- vim error?



```
E325: ATTENTION
Found a swap file by the name ".lab01.c.swp"
          owned by: ee231002   dated: Fri Sep  9 07:19:36 2016
         file name: ~ee231002/C_program/lab01/lab01.c
          modified: no
         user name: ee231002   host name: ws38
        process ID: 1907 (still running)
While opening file "lab01.c"

(1) Another program may be editing the same file.
    If this is the case, be careful not to end up with two
    different instances of the same file when making changes.
    Quit, or continue with caution.

(2) An edit session for this file crashed.
    If this is the case, use ":recover" or "vim -r lab01.c"
    to recover the changes (see ":help recovery").
    If you did this already, delete the swap file ".lab01.c.swp"
    to avoid this message.

Swap file ".lab01.c.swp" already exists!
[O]pen Read-Only, (E)dit anyway, (R)ecover, (Q)uit, (A)bort:
```

Swap File

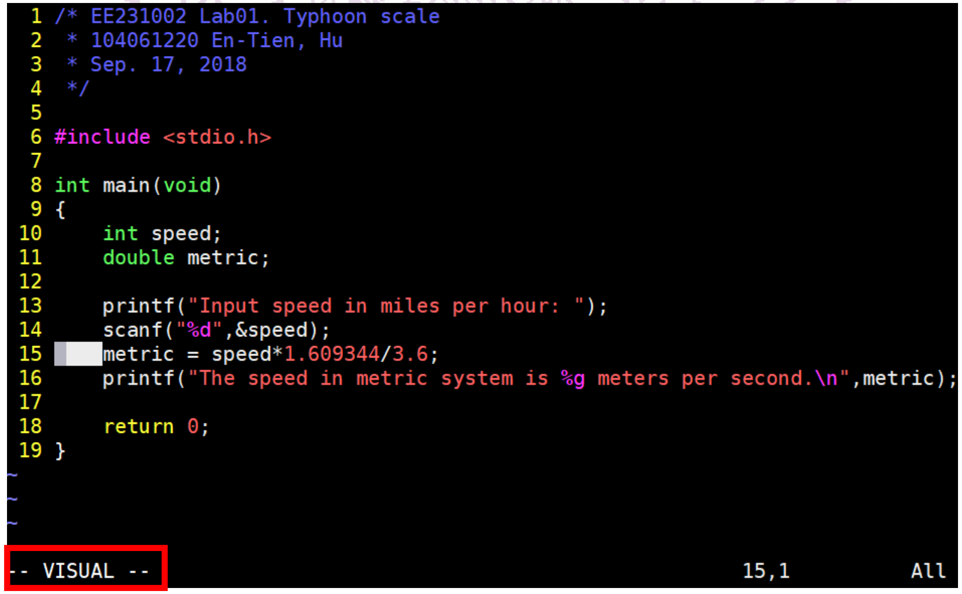
- When editing a file `file`, a temporary file `.file.swp`, is created
  - `.file.swp` is deleted after successful quitting from vim program
  - If vim is abnormally terminated, `.file.swp` remains
  - The next time `vim file` will have an error
  - This `.file.swp` should be removed using `linux` command
    - `rm .file.swp`



```
[ee231002@ws38 lab01]$ vim lab01.c
[ee231002@ws38 lab01]$ rm .lab01.c.swp
[ee231002@ws38 lab01]$ vim lab01.c
```

Select Words (VISUAL mode)

- In normal mode, you can select words by following instructions:
  - `v` : select from cursor
  - `V` : select the whole line
  - `Ctrl+v` : select a block
  - Press `Esc` if you want to cancel
  - Use direction keys to control



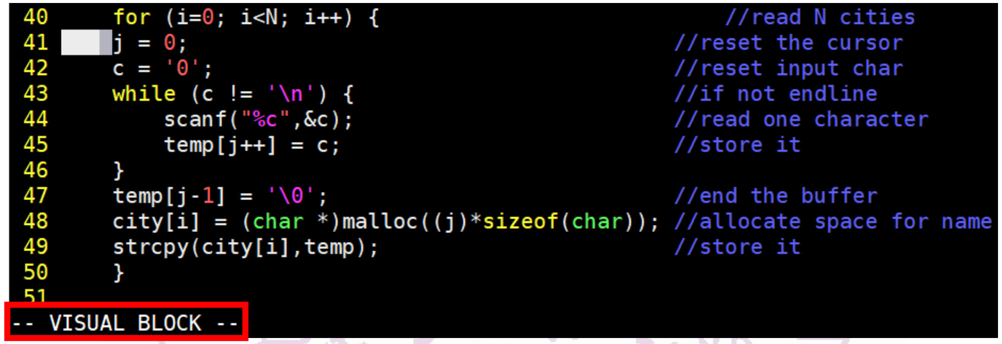
```
/* EE231002 Lab01. Typhoon scale
 * 104061220 En-Tien, Hu
 * Sep. 17, 2018
 */

#include <stdio.h>

int main(void)
{
    int speed;
    double metric;

    printf("Input speed in miles per hour: ");
    scanf("%d",&speed);
    metric = speed*1.609344/3.6;
    printf("The speed in metric system is %g meters per second.\n",metric);

    return 0;
}
~
~
~
-- VISUAL --                                          15,1          All
```

Indentation

- You can also indent the text in normal mode
  - `>>` : insert one unit indentation to right
  - `<<` : insert one unit indentation to left
- You may feel frustrated if you need to indent the whole block
  - Use `Ctrl+v` to select a block
  - Then `>` to insert one unit indentation to right and `<` to left

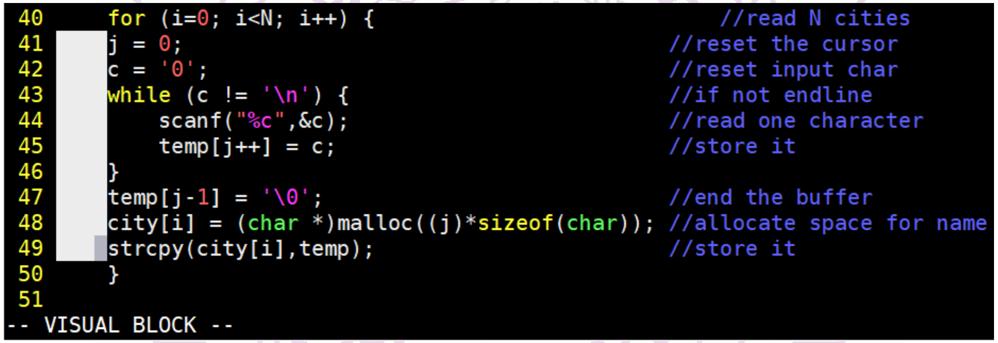
Indentation Example

- `Ctrl+v`:



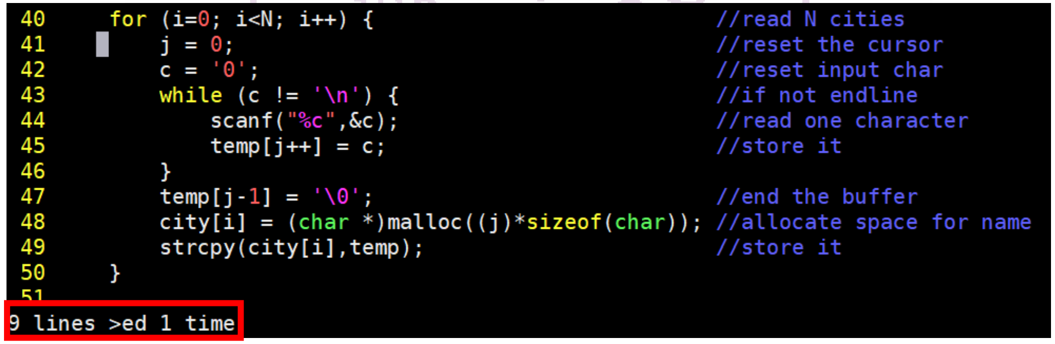
```
    for (i=0; i<N; i++) {                           //read N cities
    j = 0;                                      //reset the cursor
    c = '0';                                    //reset input char
    while (c != '\n') {                         //if not endline
        scanf("%c",&c);                         //read one character
        temp[j++] = c;                          //store it
    }
    temp[j-1] = '\0';                           //end the buffer
    city[i] = (char *)malloc((j)*sizeof(char)); //allocate space for name
    strcpy(city[i],temp);                       //store it
    }

-- VISUAL BLOCK --
```

- Select by ↓ :



```
    for (i=0; i<N; i++) {                           //read N cities
    j = 0;                                      //reset the cursor
    c = '0';                                    //reset input char
    while (c != '\n') {                         //if not endline
        scanf("%c",&c);                         //read one character
        temp[j++] = c;                          //store it
    }
    temp[j-1] = '\0';                           //end the buffer
    city[i] = (char *)malloc((j)*sizeof(char)); //allocate space for name
    strcpy(city[i],temp);                       //store it
    }

-- VISUAL BLOCK --
```

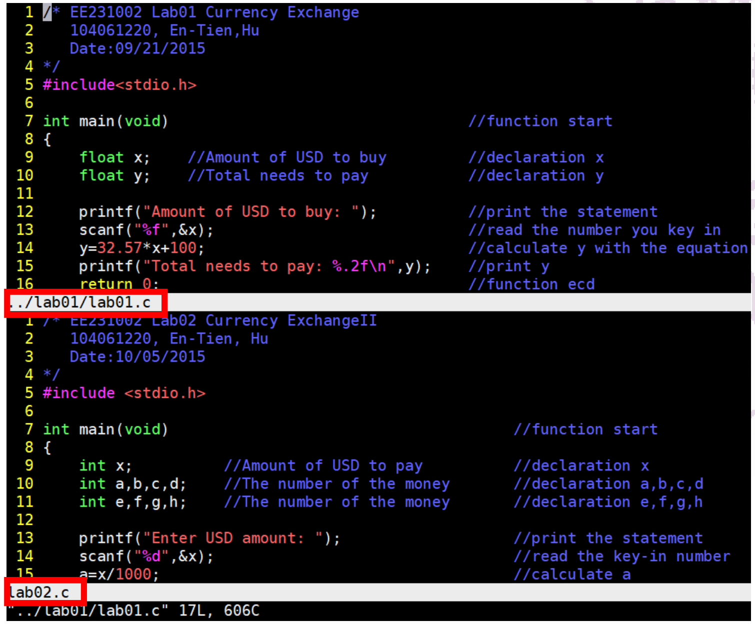
- Indent by > :



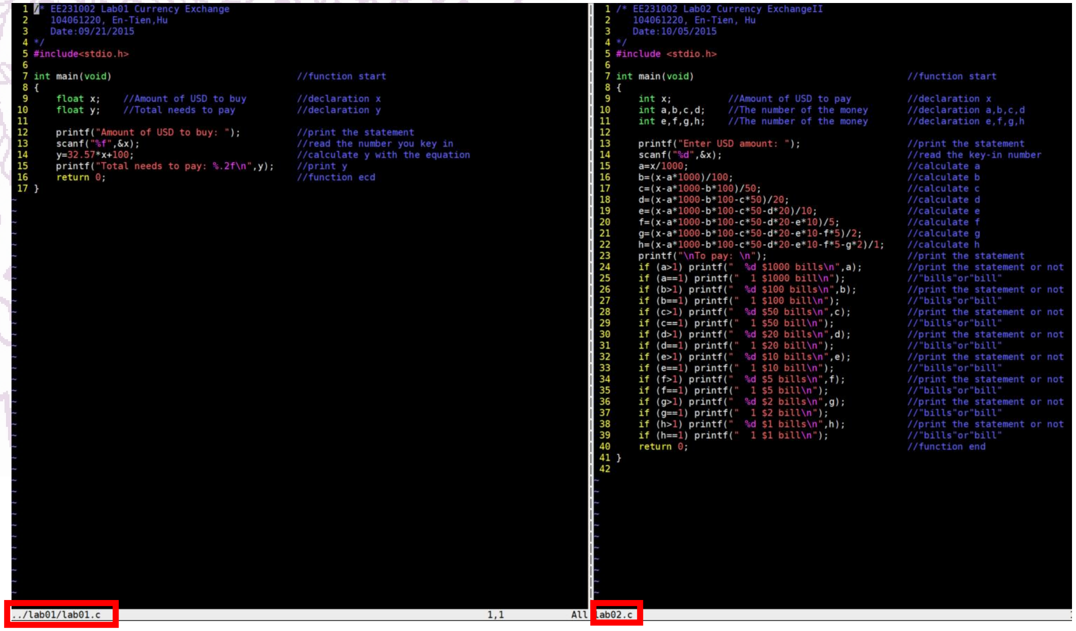
```
    for (i=0; i<N; i++) {                           //read N cities
        j = 0;                                      //reset the cursor
        c = '0';                                    //reset input char
        while (c != '\n') {                         //if not endline
            scanf("%c",&c);                         //read one character
            temp[j++] = c;                          //store it
        }
        temp[j-1] = '\0';                           //end the buffer
        city[i] = (char *)malloc((j)*sizeof(char)); //allocate space for name
        strcpy(city[i],temp);                       //store it
    }

9 lines >ed 1 time
```

How to Open Several Files

- Of course you can do so by opening several terminals
- Nonetheless, this slide tells you how to do so in single terminal
- If you want to open lab01.c when you are editing lab02.c under lab02
    - `:sp ../lab01/lab01.c` :
    - `:vsp ../lab01/lab01.c` :



```
/* EE231002 Lab01 Currency Exchange
   104061220, En-Tien,Hu
   Date:09/21/2015
*/
#include<stdio.h>

int main(void)                                      //function start
{
    float x;    //Amount of USD to buy              //declaration x
    float y;    //Total needs to pay                //declaration y

    printf("Amount of USD to buy: ");               //print the statement
    scanf("%f",&x);                                 //read the number you key in
    y=32.57*x+100;                                  //calculate y with the equation
    printf("Total needs to pay: %.2f\n",y);         //print y
    return 0;                                       //function ecd
../lab01/lab01.c
/* EE231002 Lab02 Currency ExchangeII
   104061220, En-Tien, Hu
   Date:10/05/2015
*/
#include <stdio.h>

int main(void)                                           //function start
{
    int x;          //Amount of USD to pay               //declaration x
    int a,b,c,d;    //The number of the money            //declaration a,b,c,d
    int e,f,g,h;    //The number of the money            //declaration e,f,g,h

    printf("Enter USD amount: ");                        //print the statement
    scanf("%d",&x);                                      //read the key-in number
    a=x/1000;                                            //calculate a
lab02.c
"../lab01/lab01.c" 17L, 606C
```



```
/* EE231002 Lab01 Currency Exchange
   104061220, En-Tien,Hu
   Date:09/21/2015
*/
#include<stdio.h>

int main(void)                                      //function start
{
    float x;    //Amount of USD to buy              //declaration x
    float y;    //Total needs to pay                //declaration y

    printf("Amount of USD to buy: ");               //print the statement
    scanf("%f",&x);                                 //read the number you key in
    y=32.57*x+100;                                  //calculate y with the equation
    printf("Total needs to pay: %.2f\n",y);         //print y
    return 0;                                       //function ecd
}
```

```
/* EE231002 Lab02 Currency ExchangeII
   104061220, En-Tien, Hu
   Date:10/05/2015
*/
#include <stdio.h>

int main(void)                                           //function start
{
    int x;          //Amount of USD to pay               //declaration x
    int a,b,c,d;    //The number of the money            //declaration a,b,c,d
    int e,f,g,h;    //The number of the money            //declaration e,f,g,h

    printf("Enter USD amount: ");                        //print the statement
    scanf("%d",&x);                                      //read the key-in number
    a=x/1000;                                            //calculate a
    b=(x-a*1000)/100;                                    //calculate b
    c=(x-a*1000-b*100)/50;                               //calculate c
    d=(x-a*1000-b*100-c*50)/20;                          //calculate d
    e=(x-a*1000-b*100-c*50-d*20)/10;                     //calculate e
    f=(x-a*1000-b*100-c*50-d*20-e*10)/5;                 //calculate f
    g=(x-a*1000-b*100-c*50-d*20-e*10-f*5)/2;             //calculate g
    h=(x-a*1000-b*100-c*50-d*20-e*10-f*5-g*2)/1;         //calculate h
    printf("\nTo pay: \n");                              //print the statement
    if (a>1) printf("  %d $1000 bills\n",a);             //print the statement or not
    if (a==1) printf("  1 $1000 bill\n");                //"bills"or"bill"
    if (b>1) printf("  %d $100 bills\n",b);              //print the statement or not
    if (b==1) printf("  1 $100 bill\n");                 //"bills"or"bill"
    if (c>1) printf("  %d $50 bills\n",c);               //print the statement or not
    if (c==1) printf("  1 $50 bill\n");                  //"bills"or"bill"
    if (d>1) printf("  %d $20 bills\n",d);               //print the statement or not
    if (d==1) printf("  1 $20 bill\n");                  //"bills"or"bill"
    if (e>1) printf("  %d $10 bills\n",e);               //print the statement or not
    if (e==1) printf("  1 $10 bill\n");                  //"bills"or"bill"
    if (f>1) printf("  %d $5 bills\n",f);                //print the statement or not
    if (f==1) printf("  1 $5 bill\n");                   //"bills"or"bill"
    if (g>1) printf("  %d $2 bills\n",g);                //print the statement or not
    if (g==1) printf("  1 $2 bill\n");                   //"bills"or"bill"
    if (h>1) printf("  %d $1 bills\n",h);                //print the statement or not
    if (h==1) printf("  1 $1 bill\n");                   //"bills"or"bill"
    return 0;                                            //function end
}
```

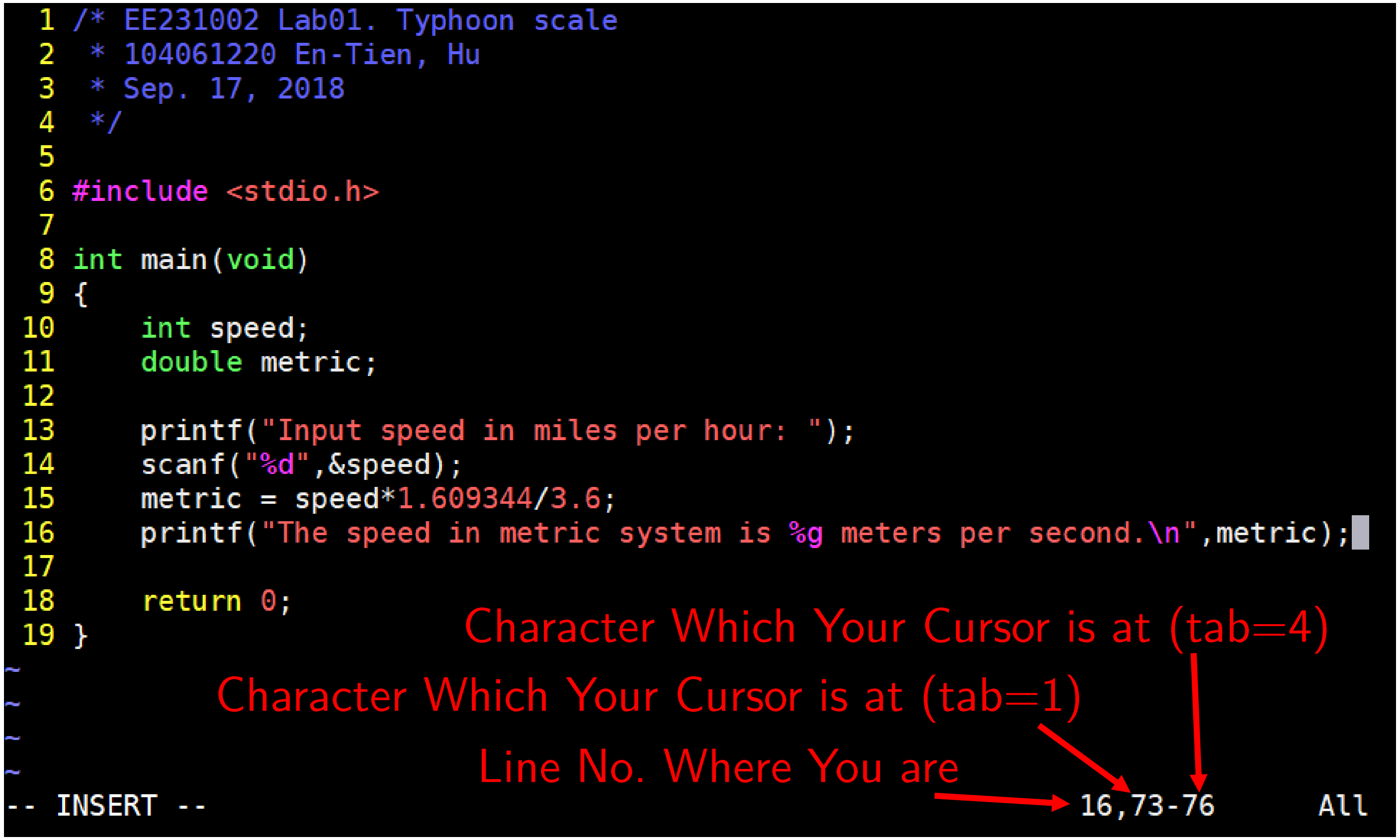
```
../lab01/lab01.c                              1,1           All  lab02.c
```

How to Open Several Files - More Commands

- The cursor can only show up in one file
  - `Ctrl+w` + `↑` `↓` `←` `→` : Move the cursor to files in corresponding directions
  - If there are only two files: simply `Ctrl+ww` to switch between the files
- If you want to close the file
  - `:wq` and `ZZ` still work to close and store the file at which the cursor is
  - `Ctrl+w` + `q` also work to close and store the file at which the cursor is
- Sometimes the files do not share same area
  - `Ctrl+w` + `=` to rearrange the area of the files

How to Check the Number of Characters

- You need to know what the numbers on the right-bottom corner mean



```
  1 /* EE231002 Lab01. Typhoon scale
  2  * 104061220 En-Tien, Hu
  3  * Sep. 17, 2018
  4  */
  5 
  6 #include <stdio.h>
  7 
  8 int main(void)
  9 {
 10     int speed;
 11     double metric;
 12 
 13     printf("Input speed in miles per hour: ");
 14     scanf("%d",&speed);
 15     metric = speed*1.609344/3.6;
 16     printf("The speed in metric system is %g meters per second.\n",metric);
 17 
 18     return 0;
 19 }
~
~
~
~
-- INSERT --                                                  16,73-76      All
```

Character Which Your Cursor is at (tab=4)

Character Which Your Cursor is at (tab=1)

Line No. Where You are

- Therefore, you should go to the end of the line and see the third number on the right-bottom corner and make sure it is no more than 80!