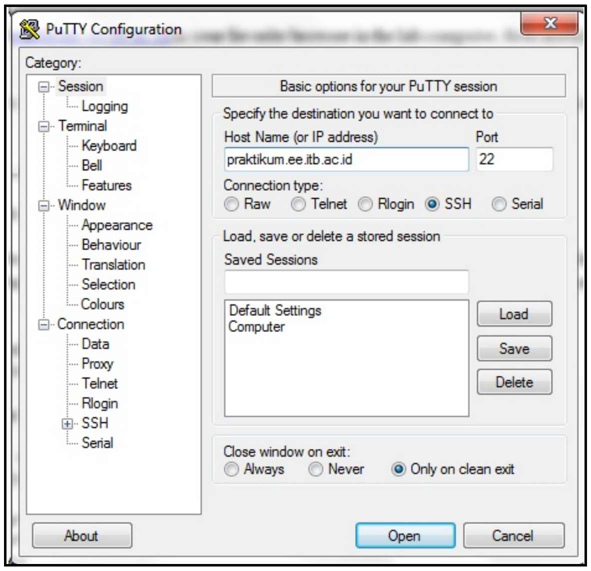
EL2208 Problem Solving with C Lab. Lab #1

Introduction: Compiling, linking, and running C codes.

Open http://praktikum.ee.itb.ac.id in your favorite browser in the lab computer, then download Putty from there.

Open Putty to connect remotely to the server of praktikum.ee.itb.ac.id, by following this picture:



Specify the destination you want to connect to

Host Name (or IP address): praktikum.ee.itb.ac.id

Port: 22

Connection type: Raw Telnet Rlogin [✓ SSH] Serial

Load, save or delete a stored session

Saved Sessions

Default Settings
Computer

Close window on exit: Always Never [✓ Only on clean exit]

Then click “Open”, enter your NIM as username and password.

The following screen will appear:

```
login as: 13212145
13212145@praktikum.ee.itb.ac.id's password:
Last login: Wed Feb  5 06:56:47 2014 from el3110.ee.itb.ac.id
[13212145@praktikum ~]$
```

In the prompt, create a directory with “lab1" as its name. Type the following command:

```
mkdir lab1
```

Once you have created the subdirectory, then type `cd lab1` to change to the subdirectory. Then you may start the lab exercises. All the files that you create and use are stored in this subdirectory.

Open a text editor by typing:

```
nano lab1a.c
```

Then type the following code into the text editor:

```
#include <stdio.h>
int main(void)
{
    int a=4;
    int b=7;
    int c;
    c = a+b;
    printf("c = %d\n",c);
    return(0);
}
```

Save it by pressing Ctrl+O. Then go back to the unix terminal by pressing Ctrl+X and compile the it with the following command:

```
gcc -c lab1a.c
```

Any errors you had in the code will appear now. Go back and correct them now. When the code compiles successfully, make the executable with the command

```
gcc -o lab1a lab1a.o
```

The previous two commands can be combined into one with the same result but without making the object file (lab1a.o):

```
gcc -o lab1a lab1a.c
```

The file `lab1a` is the executable file. This is the file you "run" on the computer. To run it, type

```
./lab1a
```

on the command line. Now use the `dir` command to see the files on your diskspace. There will be files called `lab1a.c, lab1a.o, and lab1a`; the source code file, the object file and the executable file, respectively. When you turn in your lab work, send the file ending in .c! Do NOT try to print the object or executable files as they are unreadable to humans. Next, create a new file called `lab1b.c` with the text editor and type the following program into it.

```
#include <stdio.h>
#define PI 3.1415926
int main(void)
{
    double radius;
    double surface_area;
    double volume;
    printf("\nEnter the radius of the sphere: ");
    scanf("%lf",&radius);
    surface_area = 4*PI*radius*radius;
    volume = 4.0/3.0*PI*radius*radius*radius;
    printf("radius: \t %lf\n",radius);
    printf("surface area: \t %lf\n",surface_area);
    printf("volume: \t %lf\n",volume);
    return(0);
}
```

Compile, link and run this code just like you did in the last section for lab1a. Execute the code and when it asks you for a radius, enter a value. The output should appear on the screen in front of you if everything runs correctly. One VERY common mistake is leaving out the & in the `scanf()` function. Also remember all of the semi-colons! Next, create a new file called `lab1b.in` with the text editor. Enter a single number on the first line and save the file. The number you put in the file will be used as the radius of the sphere when you run the code again. This time, to run the code use the following command:

```
lab1b < lab1b.in
```

The `scanf()` function will read the radius from the file rather than from the keyboard. This is called redirected input. Execute the command:

```
lab1b < lab1b.in > lab1b.out
```

The file `lab1b.out` now has all of the output in it that was previously shown on the screen. This is an example of redirected output. To view the output with the more command in Command Prompt, type:

```
more lab1b.out
```

You can look at (but not edit) any text file with the more command.

After you have shown the lab instructor that both of these codes run correctly, submit it by typing:

```
perl /home/yourNIM/labsubmit.pl
```

Then follow the instructions, your code will be sent to your lab instructor's e-mail.

Close putty by typing:
```
exit
```

Then shut down the computer.