CSC111 Computer Science II

Lab 4 – A modular programming, makefile, tar, gz, and alpine

Introduction

The purpose of this lab is to write a modular program and a simple makefile for using code in Lab 4. Also, you will practice creating tar and gz file and learn how to send an email using alpine.

Getting started

Using your favorite editor, set-up the standard format of C.

```
/* CSC111 Computer Science II
   Lab 4 A modular programming, makefile, tar, gz, and alpine
   Programmer: Your Name
   Professor: Dr. Lee
   File Created: Feb 5, 2024
   File Updated: Feb 5, 2024
*/

#include <stdio.h>

int main()
{
   return 0;
}
```

How to create makefile and What makefile does

Make directory Lab4 and create files (lab4.c, lab4.h, lab4a.c, lab4b.c, makefile) below. Put the proper information and comments on each file. In makefile, # is used for a comment.

```
// lab4.c
#include <stdio.h>
#include "lab4.h"
#define NUM 100
int main()
{
   int s;
   printf("This is Lab 4.\n");
   printf("Let's add some integers.\n");

   s = lab4a(NUM);
   printf("lab4a: sum of 1 to %d = %d\n", NUM, s);

   s = lab4b(NUM);
   printf("lab4b: sum of 1 to %d = %d\n", NUM, s);

   return 0;
}
```

```
// lab4.h
int lab4a(int);
int lab4b(int);

// lab4a.c
#include "lab4.h"

int lab4a(int n)
{
   int i;
   int s = 0;
   for (i=1; i<=n; i++)
   {
       s+=i;
   }
   return s;
}

// lab4b.c
#include "lab4.h"
int lab4b(int i)
{
   int s;
   s = (i*(i+1))/2;
   return s;
}

# makefile
# You press the tab key when you see [TAB] in the following makefile

SOURCES = lab4.c lab4a.c lab4b.c
OBJECTS = lab4.o lab4a.o lab4b.o
HEADERS = lab4.h
CC = gcc
CFLAGS = -g -Wall

Lab4: $(OBJECTS)
[TAB]  $(CC) $(CFLAGS) $(OBJECTS) -o lab4
clean:
[TAB]  rm -fR *o lab4
```

How to use makefile

type

make

How to create tar.gz file

```
Move to lab4.
lab4> make clean
lab4> tar -cvf lab4.tar *
```
[or type] `tar -cvf lab4.tar lab4.c lab4.h lab4a.c lab4b.c makefile`
```
lab4> ls (you will see lab4.tar)
lab4> gzip lab4.tar
lab4> ls (you will see lab4.tar.gz)
```

Always make sure that your tar.gz file is properly created. Otherwise, it would be considered as a malicious code if you email it. How to check?

```
Make directory TEST under lab4.
Move to TEST.
lab4/TEST> cp ../lab4.tar.gz .
lab4/TEST> gzip -d lab4.tar.gz
lab4/TEST> ls                (you will see lab4.tar)
lab4/TEST> tar -xvf lab4.tar
lab4/TEST> ls                (you will see all the files you tar/gzip)
```

Good! Checking is done.
```
lab4/TEST> cd ..  (move back to Lab4)
lab4> rm -fR TEST
```

Email the tar.gz file using Alpine

```
lab4> alpine
In alpine,
ctrl-c (to compose)
ctrl-t (to attach file)
ctrl-x (to send)
q (to quit)
```