

## 2.7 How to use Cygwin (シグウィン)

Cygwin = Compiler

A tool to run C or Fortran source code.

Go to <https://www.cygwin.com/>

Install Cygwin by running `setup-x86_64.exe`.

In `Devel`, check all of the `gcc-xxxxx`.

In the case of Mac, for example, see [https://joho.g-edu.uec.ac.jp/joho/gcc\\_mac/](https://joho.g-edu.uec.ac.jp/joho/gcc_mac/)

After installing, click `Cygwin64 Terminal` in the desktop.

Type `notepad [file name].c`, then write the following source code:

Print "Hello!"

```
1: #include <math.h>
2: #include <stdio.h>
3: void main(){
4: printf("Hello!\n");
5: }
```

Save the file [file name].c .

Note that [file name] should be the file name you like.

To compile the file `[file name].c`, type

```
gcc -O [file name].c -o [file name] -lm
```

and

```
./[file name]
```

Then, you will see:

```
-----From Here-----
```

```
Hello!
```

```
-----
```

(\*) `-O` indicates optimization of the source code (i.e., execution speed is optimized).

(\*\*) `-o` specifies execution file name (i.e., default execution file name is `a.exe`).

(\*\*\*) `-lm` indicates usage of math library (i.e., we can use math function).

## Repeat Computation

```
1: #include <math.h>
2: #include <stdio.h>
3:
4: void main(){
5:
6:     int i,n;
7:     float sum=0.0;
8:
9:     n=10;
10:    for(i=1;i<=n;++i){
11:        sum=sum+(float)i;
12:        printf("%d %f\n",i,sum);
13:    }
14: }
```

Suppose that the above source code is named as `ex2.c`.

Type:

```
gcc -O ex2.c -o ex2 -lm
```

```
./ex2
```

Then, the output in the screen is as follows:

```
-----From Here-----  
1 1.000000  
2 3.000000  
3 6.000000  
4 10.000000  
5 15.000000  
6 21.000000  
7 28.000000  
8 36.000000  
9 45.000000  
10 55.000000  
-----
```

Line 12 is changed to:

```
printf("%5d %7.1f\n",i,sum);
```

Then,

```
-----From Here-----  
 1      1.0  
 2      3.0  
 3      6.0  
 4     10.0  
 5     15.0  
 6     21.0  
 7     28.0  
 8     36.0  
 9     45.0  
10     55.0  
-----
```

Line 9 is changed to:

```
scanf("%d",&n);
```

We can input **n**

————— Numerical Integration of  $N(0,1)$  —————

```
1: #include <math.h>
2: #include <stdio.h>
3:
4: void main(){
5:
6:     int i,nl,nu;
7:     double area=0.0;
8:     double w,h,x,rl,ru;
9:     double pi=3.141592653589793238462643383279502884197;
10:
11:     scanf("%lf%lf%lf",&rl,&ru,&w);
12:
13:     nl=(int)(rl/w);
14:     nu=(int)(ru/w);
15:     for(i=nl;i<=nu;++i){
16:         x=w*(float)i;
17:         h=exp(-0.5*x*x)/sqrt(2.0*pi);
18:         area=area+h*w;
19:     }
```



```
20:     printf("%10.8lf\n", area);  
21: }
```