

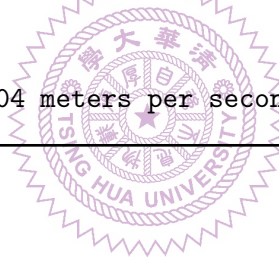
EE231002 Introduction to Programming

Lab01. Typhoon scale

Due: Sep. 17, 2018

Recently there are two strong tropical storms affecting the global weather: one in the west Pacific named Typhoon Mangkhut(山竹) and one in the west Atlantic with the name Hurricane Florence. Both are claimed to be one of the strongest storms of the year. It has been predicted that Typhoon Mangkhut has the sustained wind speed of 55 meters per second (m/s) and Hurricane Florence has the sustained wind speed of 140 miles per hour (mph). As reported, it is difficult for us to judge which one is stronger than the other since one is reported in Metric System (m/s) and the other in Imperial Unit (mph). Thus, your first assignment is to write a C program to take the speed expressed in Imperial Unit (mph) and convert it to Metric System. It has been defined that 1 mile is 1.609344 kilometers. Example program execution is shown below.

```
$ ./a.out
Input speed in miles per hour: 140
The speed in metric system is 62.5856 meters per second.
$ ./a.out
Input speed in miles per hour: 100
The speed in metric system is 44.704 meters per second.
```



Notes.

1. Create a directory **lab01** and use it as the working directory.
2. Name your program source file as **lab01.c**.
3. The first few lines of your program should be comments as the following.

```
/* EE231002 Lab01. Typhoon scale
   Your ID, Name
   Date */
```

4. After finishing editing your source file, you can execute the following command to compile the program,

```
$ gcc lab01.c
```

If no compilation errors, the executable file, **a.out**, should be generated, and you can execute it by typing

```
$ ./a.out
```

5. Typical inputs and outputs of the program execution have been shown above. But you should try a few more test cases to make sure your program function correctly.

6. After you finish verifying your program, you can submit your source code by

```
$ ~ee2310/bin/submit lab01 lab01.c
```

If you see a "submitted successfully" message, then you are done. In case you want to check which file and at what time you submitted your labs, you can type in the following command:

```
$ ~ee2310/bin/subrec lab01
```

It will show the last few submission records.

7. (Challenges, no need to submit) The tropical storms in the west Atlantic can be classified as the following:

Category	Wind speed
Five	≥ 157 mph
Four	130 – 156 mph
Three	111 – 129 mph
Two	96 – 110 mph
One	74 – 95 mph

If the wind speed is less than 74 mph, then it is called a tropical depression but not a tropical storm. Please write a program to find the wind speed ranges for the five categories of tropical storms in Metric System (m/s).

Coding Guidelines

1. Use **comments** to explain your codes.
 - 1.1. Header comments are needed at the beginning of a file.
 - 1.2. Global variables and function declarations need to have comments.
 - 1.3. Key operations must be clearly documented.
 - 1.4. Spelling must be correct.
 - 1.5. Comments should also be properly indented and with space characters inserted.
2. Use **indentation** to group statements at the same block level.
 - 2.1. Use <tab> for indentation.
3. Use **blank lines** to separate
 - 3.1. directives and functions,
 - 3.2. declarations and statements.
 - 3.3. All declarations must precede statements in a function.
4. Use **space character** to separate tokens.
 - 4.1. The same way as in English sentences.
5. **Variable name** should be descriptive.
 - 5.1. *i, j, k* for integral local temporary variables,
 - 5.2. *x, y, z* for floating point local temporary variables,
 - 5.3. *p, q, r* for local temporary pointers.
 - 5.4. All-capital tokens for symbolic constants.
6. Each line of source code **should not** have more than **80 characters**.