

# Homework #8

(Due date: 16 November 2023)

## Objective :

Learn to use **array** and combine with **for** and **while loops** to

implement some operations.

### 8.1

Write a program that generates 100 random numbers between 1 to 50, then outputs these 100 numbers, the count of each number, and calculates the mean, mode, median, and standard deviation of these numbers.

Hint:

Mean: The mean is the average value of numbers.

Mode: The mode in a set of data is the value that appears most frequently.

Median: The median is the middle value in a dataset when it is arranged in ascending or descending order. If there is an even number of data points, the median is the average of the two middle values.

Standard Deviation: square the difference between each number and the mean, sum them up, and then take the square root of the average.

```
1  #include<stdio.h>
2  #include<stdlib.h>
3  #include<time.h>
4
5  int main(){
6
7      srand(time(NULL));
8      //隨機生成一個介於0到9之間的數字
9      int randnum = rand() % 10;
10
```

Output:

```
17 34 6 49 11 30 47 43 11 29
18 1 47 44 32 16 32 6 8 3
41 7 35 16 1 41 28 36 31 21
15 4 28 5 29 29 31 15 13 42
18 34 13 18 29 37 29 47 47 2
17 20 31 49 30 29 48 15 22 2
33 30 1 31 18 26 33 23 45 9
6 41 10 26 44 41 30 34 2 12
33 42 6 12 42 43 41 9 14 41
37 10 11 19 9 11 29 6 20 50

1: 3 2: 3 3: 1 4: 1 5: 1
6: 5 7: 1 8: 1 9: 3 10: 2
11: 4 12: 2 13: 2 14: 1 15: 3
16: 2 17: 2 18: 4 19: 1 20: 2
21: 1 22: 1 23: 1 24: 0 25: 0
26: 2 27: 0 28: 2 29: 7 30: 4
31: 4 32: 2 33: 3 34: 3 35: 1
36: 1 37: 2 38: 0 39: 0 40: 0
41: 6 42: 3 43: 2 44: 2 45: 1
46: 0 47: 4 48: 1 49: 2 50: 1

Mean: 24.690000
Mode: 29
Median: 28.000000
Standard Deviation: 14.328779
```

## 8.2

Continuing from the previous question, write a program to separate these 100 numbers into odd and even, and output them in ascending order.

Output :

```
odd:
1 1 1 3 5 7 9 9 9 11
11 11 11 13 13 15 15 15 17 17
19 21 23 29 29 29 29 29 29 29
31 31 31 31 33 33 33 35 37 37
41 41 41 41 41 41 43 43 45 47
47 47 47 49 49

even:
2 2 2 4 6 6 6 6 6 8
10 10 12 12 14 16 16 18 18 18
18 20 20 22 26 26 28 28 30 30
30 30 32 32 34 34 34 36 42 42
42 44 44 48 50
```

**Please note:: users of visual studio add the following code to your program's beginning**

```
2  #pragma warning(disable:4996)
```

繳交格式及規定：

程式重點地方請加註解,給分也會酌量參考註解。

請繳交 .c 檔即可。

c 檔的檔名一律統一,以學號為檔名壓縮成一個以學號為名的壓縮檔  
上傳,

上傳請一律繳交壓縮檔。

Example:

若學號為 B123456789, 則.c/.cpp 檔名為 B123456789.c ,

而壓縮檔名為 B123456789.rar 。

繳交期限 2023.11.16 (四) 09:00 分之前,逾期一律不收,

無輸入輸出及逾期者一律以 0 分計算。

作業請上傳中山網路大學 網大上傳方式:

1. 點選要繳交的作業,選擇「進行作業」。



2. 依照流程上傳檔案。

