
1- Write a program to find the maximum and minimum elements in an array.

اكتب برنامج لإيجاد الحد الأقصى والحد الأدنى للعناصر في array.

Output

```
Maximum Element: 8
Minimum Element: 1
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int main() {
    int arr[] = {3, 8, 2, 5, 1};
    int n = sizeof(arr) / sizeof(arr[0]);
    int max = arr[0], min = arr[0];

    for (int i = 1; i < n; i++) {
        if (arr[i] > max) {
            max = arr[i];
        }
        if (arr[i] < min) {
            min = arr[i];
        }
    }

    printf("Maximum Element: %d\n", max);
    printf("Minimum Element: %d\n", min);

    return 0;
}
```

2- Write a program to find the maximum and minimum of two numbers using a function.

اكتب برنامجًا لإيجاد الحد الأقصى والأدنى لعددين باستخدام function.

Output

```
Maximum Number: 7
Minimum Number: 4
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int findMax(int a, int b) {
    return (a > b) ? a : b;
}

int findMin(int a, int b) {
    return (a < b) ? a : b;
}

int main() {
    int num1 = 7, num2 = 4;

    printf("Maximum Number: %d\n", findMax(num1, num2));
    printf("Minimum Number: %d\n", findMin(num1, num2));

    return 0;
}
```

3- Write a program that takes user input for three numbers and finds the maximum and minimum among them.

اكتب برنامجًا يأخذ مدخلات المستخدم لثلاثة أرقام ويجد الحد الأقصى والأدنى بينها.

Input

```
Enter three numbers: 5 3 9
```

Output

```
Maximum Number: 9
Minimum Number: 3
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int main() {
    int num1, num2, num3;

    printf("Enter three numbers: ");
    scanf("%d %d %d", &num1, &num2, &num3);

    int max = (num1 > num2) ? (num1 > num3 ? num1 : num3) : (num2 > num3 ? num2 : num3);
    int min = (num1 < num2) ? (num1 < num3 ? num1 : num3) : (num2 < num3 ? num2 : num3);

    printf("Maximum Number: %d\n", max);
    printf("Minimum Number: %d\n", min);

    return 0;
}
```

4- Write a program to find the maximum and minimum elements in a 2D matrix.

اكتب برنامجًا لإيجاد الحد الأقصى والأدنى للعناصر في matrix 2D.

Output

```
Maximum Element: 9
Minimum Element: 1
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int main() {
    int matrix[3][3] = {{5, 8, 2}, {3, 6, 1}, {7, 4, 9}};
    int rows = 3, cols = 3;
    int max = matrix[0][0], min = matrix[0][0];

    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            if (matrix[i][j] > max) {
                max = matrix[i][j];
            }
            if (matrix[i][j] < min) {
                min = matrix[i][j];
            }
        }
    }

    printf("Maximum Element: %d\n", max);
    printf("Minimum Element: %d\n", min);

    return 0;
}
```

5- Write a program to find the maximum and minimum characters in a string.

اكتب برنامجًا للعثور على الحد الأقصى والحد الأدنى من الأحرف في الكلمة.

Output

```
Maximum Character: o
Minimum Character: e
```

Solution

```c
// www.gammal.tech

#include <stdio.h>
#include <string.h>

int main() {
    char str[] = "hello";
    int len = strlen(str);
    char max = str[0], min = str[0];

    for (int i = 1; i < len; i++) {
        if (str[i] > max) {
            max = str[i];
        }
        if (str[i] < min) {
            min = str[i];
        }
    }

    printf("Maximum Character: %c\n", max);
    printf("Minimum Character: %c\n", min);

    return 0;
}
```

6- Write a program to find the maximum and minimum elements in an array using pointers.

اكتب برنامجًا للعثور على الحد الأقصى والأدنى للعناصر في array باستخدام pointers.

Output

```
Maximum Element: 8
Minimum Element: 1
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

void findMaxMin(int *arr, int n, int *max, int *min) {
    *max = *min = arr[0];

    for (int i = 1; i < n; i++) {
        if (arr[i] > *max) {
            *max = arr[i];
        }
        if (arr[i] < *min) {
            *min = arr[i];
        }
    }
}

int main() {
    int arr[] = {3, 8, 2, 5, 1};
    int n = sizeof(arr) / sizeof(arr[0]);
    int max, min;

    findMaxMin(arr, n, &max, &min);

    printf("Maximum Element: %d\n", max);
    printf("Minimum Element: %d\n", min);

    return 0;
}
```

7- Write a program to find the maximum and minimum numbers from a file containing integers.

اكتب برنامجًا للعثور على الحد الأقصى والأدنى للأرقام من ملف يحتوي على أعداد صحيحة.

Input

numbers.txt

```
1   1 5 2 3 9 1 10
```

Output

```
Maximum Number: 10
Minimum Number: 1
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int main() {
    FILE *file = fopen("numbers.txt", "r");
    if (file == NULL) {
        printf("Error opening the file.\n");
        return 1;
    }

    int num, max, min;
    fscanf(file, "%d", &num);
    max = min = num;

    while (fscanf(file, "%d", &num) == 1) {
        if (num > max) {
            max = num;
        }
        if (num < min) {
            min = num;
        }
    }

    fclose(file);

    printf("Maximum Number: %d\n", max);
    printf("Minimum Number: %d\n", min);

    return 0;
}
```

8- Write a program to find the maximum and minimum elements in an array of 5 integers.

اكتب برنامجًا للعثور على الحد الأقصى والأدنى للعناصر في array مكونة من 5 أعداد صحيحة.

Input

```
Enter 5 numbers: 9 5 6 3 1
```

Output

```
Maximum Element: 9
Minimum Element: 1
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int main() {
    int arr[5];

    printf("Enter 5 numbers: ");
    for (int i = 0; i < 5; i++) {
        scanf("%d", &arr[i]);
    }

    int max = arr[0], min = arr[0];

    for (int i = 1; i < 5; i++) {
        if (arr[i] > max) {
            max = arr[i];
        }
        if (arr[i] < min) {
            min = arr[i];
        }
    }

    printf("Maximum Element: %d\n", max);
    printf("Minimum Element: %d\n", min);

    return 0;
}
```

9- Write a program that takes two numbers as input and finds the maximum and minimum without using any conditional statements.

اكتب برنامجًا يأخذ رقمين كمدخلات ويجد الحد الأقصى والأدنى دون استخدام أي عبارات شرطية.

Input

```
Enter two numbers: 3 9
```

Output

```
Maximum Number: 9
Minimum Number: 3
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int main() {
    int num1, num2;

    printf("Enter two numbers: ");
    scanf("%d %d", &num1, &num2);

    int sum = num1 + num2;
    int diff = num1 - num2;

    int max = (sum + abs(diff)) / 2;
    int min = (sum - abs(diff)) / 2;

    printf("Maximum Number: %d\n", max);
    printf("Minimum Number: %d\n", min);

    return 0;
}
```

10- Write a program that takes three numbers as input and finds the maximum and minimum using a function.

اكتب برنامجًا يأخذ ثلاثة أرقام كمدخلات ويجد الحد الأقصى والأدنى باستخدام function.

Input

```
Enter three numbers: 9 5 1
```

Output

```
Maximum Number: 9
Minimum Number: 1
```

Solution

```c
// www.gammal.tech

#include <stdio.h>

int findMax(int a, int b, int c) {
    int max = a;

    if (b > max) {
        max = b;
    }
    if (c > max) {
        max = c;
    }

    return max;
}

int findMin(int a, int b, int c) {
    int min = a;

    if (b < min) {
        min = b;
    }
    if (c < min) {
        min = c;
    }

    return min;
}

int main() {
    int num1, num2, num3;

    printf("Enter three numbers: ");
    scanf("%d %d %d", &num1, &num2, &num3);

    printf("Maximum Number: %d\n", findMax(num1, num2, num3));
    printf("Minimum Number: %d\n", findMin(num1, num2, num3));

    return 0;
}
```
