1- Write a program to check if a given number is a palindrome.

اكتب برنامجًا للتحقق مما إذا كان الرقم المعطى palindrome.

Input

```
Enter a number: 121
```

Output

```
Palindrome
```

Solution

```c
// www.gammal.tech

#include<stdio.h>

int main() {
    int num, originalNum, reversedNum = 0;

    printf("Enter a number: ");
    scanf("%d", &num);

    originalNum = num;

    while (num != 0) {
        reversedNum = reversedNum * 10 + num % 10;
        num /= 10;
    }

    if (originalNum == reversedNum)
        printf("Palindrome\n");
    else
        printf("Not a palindrome\n");

    return 0;
}
```

2- Write a program to check if a given number is a palindrome and find its reverse.

اكتب برنامجًا للتحقق مما إذا كان الرقم المعطى palindrome وإيجاد عكسه.

Input

```
Enter a number: 323
```

Output

```
Reverse: 323
Palindrome
```

Solution

```c
// www.gammal.tech

#include<stdio.h>

int main() {
    int num, originalNum, reversedNum = 0;

    printf("Enter a number: ");
    scanf("%d", &num);

    originalNum = num;

    while (num != 0) {
        reversedNum = reversedNum * 10 + num % 10;
        num /= 10;
    }

    printf("Reverse: %d\n", reversedNum);

    if (originalNum == reversedNum)
        printf("Palindrome\n");
    else
        printf("Not a palindrome\n");

    return 0;
}
```

3-Create a program to find the count of palindrome numbers in a given range.

قم بإنشاء برنامج للعثور على عدد الأعداد palindrome في نطاق معين.

Input

```
Enter the range (start end): 50 70
```

Output

```
55 is a palindrome
66 is a palindrome
Total palindromes: 2
```

Solution

```c
// www.gammal.tech

#include<stdio.h>

int isPalindrome(int num) {
    int originalNum = num;
    int reversedNum = 0;

    while (num != 0) {
        reversedNum = reversedNum * 10 + num % 10;
        num /= 10;
    }

    return originalNum == reversedNum;
}

int main() {
    int start, end, count = 0;

    printf("Enter the range (start end): ");
    scanf("%d %d", &start, &end);

    for (int i = start; i <= end; i++) {
        if (isPalindrome(i)) {
            printf("%d is a palindrome\n", i);
            count++;
        }
    }

    printf("Total palindromes: %d\n", count);

    return 0;
}
```

4- Create a program to check if a given number is a palindrome and its sum of digits is even.

<div dir="rtl">

أنشئ برنامجًا للتحقق مما إذا كان الرقم المعطى palindrome وأن مجموع أرقامه زوجي.

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Input

```
Enter a number: 565
```

Output

```
Reverse: 565
Palindrome and sum of digits is even
```

Solution

```c
// www.gammal.tech

#include<stdio.h>

int main() {
    int num, originalNum, reversedNum = 0, sum = 0;

    printf("Enter a number: ");
    scanf("%d", &num);

    originalNum = num;

    while (num != 0) {
        reversedNum = reversedNum * 10 + num % 10;
        sum += num % 10;
        num /= 10;
    }

    printf("Reverse: %d\n", reversedNum);

    if (originalNum == reversedNum && sum % 2 == 0)
        printf("Palindrome and sum of digits is even\n");
    else
        printf("Not a palindrome or sum of digits is odd\n");

    return 0;
}
```

5- Write a program to check if a given number is a palindrome and a perfect square.

اكتب برنامجًا للتحقق مما إذا كان الرقم المعطى palindrome ومربعًا كاملاً.

Input

```
Enter a number: 121
```

Output

```
Palindrome and a perfect square
```

Solution

```c
// www.gammal.tech

#include<stdio.h>
#include<math.h>

int isPerfectSquare(int num) {
    int sqrtNum = sqrt(num);
    return sqrtNum * sqrtNum == num;
}

int main() {
    int num, originalNum, reversedNum = 0;

    printf("Enter a number: ");
    scanf("%d", &num);

    originalNum = num;

    while (num != 0) {
        reversedNum = reversedNum * 10 + num % 10;
        num /= 10;
    }

    if (originalNum == reversedNum && isPerfectSquare(originalNum))
        printf("Palindrome and a perfect square\n");
    else
        printf("Not a palindrome or not a perfect square\n");

    return 0;
}
```

6- Create a program to check if a given number is a palindrome and a prime number.

قم بإنشاء برنامج للتحقق مما إذا كان الرقم المحدد هو عدد palindrome وعدد أولي.

Input

```
Enter a number: 131
```

Output

```
Palindrome and a prime number
```

Solution

```c
// www.gammal.tech

#include<stdio.h>

int isPrime(int num) {
    if (num < 2) {
        return 0;
    }

    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) {
            return 0;
        }
    }

    return 1;
}

int main() {
    int num, originalNum, reversedNum = 0;

    printf("Enter a number: ");
    scanf("%d", &num);

    originalNum = num;

    while (num != 0) {
        reversedNum = reversedNum * 10 + num % 10;
        num /= 10;
    }

    if (originalNum == reversedNum && isPrime(originalNum))
        printf("Palindrome and a prime number\n");
    else
        printf("Not a palindrome or not a prime number\n");

    return 0;
}
```

7- Create a program to find the product of digits of a palindrome number.

إنشاء برنامج لإيجاد ضرب أرقام عدد palindrome.

Input

```
Enter a number: 161
```

Output

```
Reverse: 161
Palindrome and product of digits: 6
```

Solution

```c
// www.gammal.tech

#include<stdio.h>

int main() {
    int num, originalNum, reversedNum = 0, product = 1;

    printf("Enter a number: ");
    scanf("%d", &num);

    originalNum = num;

    while (num != 0) {
        reversedNum = reversedNum * 10 + num % 10;
        product *= num % 10;
        num /= 10;
    }

    printf("Reverse: %d\n", reversedNum);

    if (originalNum == reversedNum)
        printf("Palindrome and product of digits: %d\n", product);
    else
        printf("Not a palindrome\n");

    return 0;
}
```

8- Create a program to check if a given string is a palindrome.

أنشئ برنامجًا للتحقق مما إذا كانت السلسلة المعطاة عبارة عن palindrome.

Input

```
Enter a string: gammal
```

Output

```
Not a palindrome
```

Solution

```c
// www.gammal.tech

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

int main() {
    char str[100];

    printf("Enter a string: ");
    gets(str);

    int length = strlen(str);
    int isPalindrome = 1;

    for (int i = 0; i < length / 2; i++) {
        if (str[i] != str[length - i - 1]) {
            isPalindrome = 0;
            break;
        }
    }

    if (isPalindrome)
        printf("Palindrome\n");
    else
        printf("Not a palindrome\n");

    return 0;
}
```

9- Create a program to find the length of a given string.

إنشاء برنامج للعثور على طول سلسلة معينة.

Input

```
Enter a string: Hello world
```

Output

```
Length of the string: 11
```

Solution

```c
// www.gammal.tech

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

int main() {
    char str[100];

    printf("Enter a string: ");
    scanf("%[^\n]" ,  str);

    printf("\nLength of the string: %d\n", strlen(str));

    return 0;
}
```

10- Write a program to count the number of spaces, tabs, and newline characters.

اكتب برنامجًا لحساب عدد المسافات وعلامات tabs وأحرف السطر الجديد.

Input

```
Enter a string: Hello world
```

Output

```
Number of words: 1
```

Solution

```c
// www.gammal.tech

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

int main() {
    char str[100];
    int count = 0;

    printf("Enter a string: ");
    scanf("%[\n]" , str);

    for (int i = 0; i < strlen(str); i++) {
        if (str[i] == ' ' || str[i] == '\t' || str[i] == '\n') {
            count++;
        }
    }

    printf("\n Number of words: %d\n", count + 1);

    return 0;
}
```