Important Programs PFPS - 1_Hello_World.c

```c
//Task: to print hello world

#include <stdio.h>

int main()
{
    printf("Hello World!");
    return 0;
}
```

Important Programs PFPS - swapping.c

```c
// Task: To swap two numbers input by the user

#include <stdio.h>

int main()
{
    int num1, num2, temp;
    printf("Enter first number: ");
    scanf("%d", &num1); // Input of first number
    printf("Enter second number: ");
    scanf("%d", &num2); // Input of second number
    // Printing numbers before swapping
    printf("num1 = %d, num2 = %d\n", num1, num2);
    // Swapping
    temp = num1;
    num1 = num2;
    num2 = temp;
    // Printing numbers after swapping
    printf("Numbers swapped\n");
    printf("num1 = %d, num2 = %d", num1, num2);
    return 0;
}
```

Important Programs PFPS - 3_Reverse_number.c

```c
// Task: To reverse a number input by user

#include <stdio.h>

int main()
{
    int num, temp, reverse, digit;
    printf("Enter number: ");
    scanf("%d", &num); // Input of number

    temp = num; // storing number in a temporary variable

    while (temp != 0)
    {
        digit = temp % 10;              // extracting digit of number
        reverse = reverse * 10 + digit; // creating reverse number
        temp = temp / 10;               // altering original number for next loop
    }

    printf("Orignal number = %d\n", num);
    printf("Reverse number = %d", reverse);
    return 0;
}
```

Important Programs PFPS - 4_sum_of_digits.c

```c
// Task: to get the sum of digits of a number given

#include <stdio.h>

int main()
{
    int num, temp, digit, sum = 0;
    printf("Enter number: ");
    scanf("%d", &num); // Input number

    temp = num; // Storing number in temp variable

    while (temp != 0)
    {
        digit = temp % 10; // Extractig digits
        sum = sum + digit; // Updating sum
        temp = temp / 10;  // Altering number
    }

    printf("Sum of digits of %d is %d", num, sum);

    return 0;
}
```

Important Programs PFPS - print_number_1_to_10.c

```c
// Task: to print numbers from 1 to 10
#include <stdio.h>

int main()
{
    int i;

    for (i = 1; i <= 10; i++)
    {
        printf("%d, ", i);
    }

    return 0;
}
```

Important Programs PFPS - 6_print_number_10_to_1.c

```c
// Task: to print numbers from 10 to 1
#include <stdio.h>

int main()
{
    int i;

    for (i = 10; i >= 1; i--)
    {
        printf("%d, ", i);
    }

    return 0;
}
```

Important Programs PFPS - 7_check_even_odd.c

```c
// To check if a number is even or odd

#include <stdio.h>

int main()
{
    int num;
    printf("Enter number: ");
    scanf("%d", &num);

    if (num % 2 == 0)
    {
        printf("%d is even", num);
    }
    else
    {
        printf("%d is odd", num);
    }

    return 0;
}
```

Important Programs PFPS - 8_GCD.c

```c
// To find GCD of two given numbers

#include <stdio.h>

int main()
{
    int num1, num2, rem, divisor, dividend;
    printf("Enter first number: ");
    scanf("%d", &num1); // Input of first number
    printf("Enter second number: ");
    scanf("%d", &num2); // Input of second number

    if (num1 > num2) // Maximum of numbers will be initial dividend
    {
        dividend = num1;
        divisor = num2;
    }
    else
    {
        dividend = num2;
        divisor = num1;
    }

    do // Applying the continuous division technique
    {
        rem = dividend % divisor;
        dividend = divisor;
        divisor = rem;

    } while (rem != 0);

    printf("GCD of %d and %d is %d", num1, num2, dividend);
    return 0;
}
```

Important Programs PFPS - 9_Fibonacci.c

```c
/* Write a program to display n terms of
fibonacci series where n is input by user*/

#include <stdio.h>

int main()
{
    int n1, n2, num, sum, temp, i = 2;

    printf("How many elements of fibonacci series you want?\n...>");
    scanf("%d", &num);
    n1 = 0;
    n2 = 1;

    if (num == 1)
    {
        printf("Fibonacci Series:\n");
        printf("%d", n1);
    }
    else if (num == 2)
    {
        printf("Fibonacci Series:\n");
        printf("%d, %d", n1, n2);
    }
    else
    {
        printf("Fibonacci Series:\n");
        printf("%d, %d, ", n1, n2);
        do
        {
            sum = n1 + n2;
            printf("%d, ", sum);
            n1 = n2;
            n2 = sum;
            i++;

        } while (i != num);
    }

    return 0;
}
```

Important Programs PFPS - 10_Prime_Number_Check.c

```c
// Check if number input by user is prime

#include <stdio.h>

int main()
{
    int num, i, flag = 0;
    printf("Input number: ");
    scanf("%d", &num);

    for (i = 2; i < num; i++)
    {
        if (num % i == 0)
        {
            printf("%d is not prime", num);
            flag = 1;
            break;
        }
    }
    if (flag == 0)
    {
        printf("%d is prime", num);
    }

    return 0;
}

// Possible code optimizations
/*
1.  If a number N is composite it must have a factor
    between 2 to N/2

2.  All prime numbers except 2 can be represented in
    form of 6n+1 or 6n-1
*/
```

Important Programs PFPS - 11_Palindrome.c

```c
// Check if input number is palindrome or not

#include <stdio.h>

int main()
{
    int num, reverse, temp, digit;

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

    temp = num;

    while (temp != 0)
    {
        digit = temp % 10;
        reverse = reverse * 10 + digit;
        temp = temp / 10;
    }

    printf("Original Number: %d\n", num);
    printf("Reverse Number: %d", reverse);

    return 0;
}
```

Important Programs PFPS - 12_factorial.c

```c
// To find factorial of given number

#include <stdio.h>

int main()
{
    int num, fact = 1, i;
    printf("Enter number: ");
    scanf("%d", &num);

    for (i = 1; i <= num; i++)
    {
        fact = fact * i;
    }

    printf("Factorial of %d is %d", num, fact);

    return 0;
}

// Code optimization
/*
We can start our loop
from 2 as multiplication from
1 is useless
*/
```

Important Programs PFPS - 13_armstrong.c

```c
// To find if number is amstrong or not
/*
A number is called armstrong when it is
equal to the sum of its digits raised to
the power of number of digits

eg 153 = 1^3 + 5^3 + 3^3
       = 1 + 125 + 27
       = 153
*/
#include <stdio.h>
#include <math.h>
int main()
{
    int num, temp1, temp2, i = 0, digit, sum = 0;

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

    // Getting number of digits
    temp1 = num;
    while (temp1 != 0)
    {
        temp1 = temp1 / 10;
        i++;
    }
    temp2 = num;
    // Getting sum of powers
    while (temp2 != 0)
    {
        digit = temp2 % 10;
        sum = sum + pow(digit, i);
        temp2 = temp2 / 10;
    }

    if (sum == num)
    {
        printf("%d is armstrong number", num);
    }
    else
    {
        printf("%d is not armstrong number", num);
    }

    return 0;
}
```

All codes are uploaded to my public git repository
https://github.com/shivrajanand/Important_Programs_Semester1.git
You can access it via given link