Assignment 7

Iterative Control

#include <stdio.h>

int main() {

int choice, N, num1, num2, num, i, j, isPrime, isArmstrong, a, b, temp, nextPrime;

int fib[20];

// Initialize Fibonacci series

fib[0] = 0;

fib[1] = 1;

for (i = 2; i < 20; i++) {

fib[i] = fib[i - 1] + fib[i - 2];

}

// 1: Find the Nth term of the Fibonacci series

printf("Enter N to find the Nth term: ");

scanf("%d", &N);

printf("The Nth term of the Fibonacci series: %lld\n\n", fib[N]);

// 2: Print the first N terms of the Fibonacci series

printf("Enter N to print the first N terms: ");

scanf("%d", &N);

printf("The first %d terms of the Fibonacci series:\n", N);

for (i = 0; i < N; i++) {

printf("%lld ", fib[i]);

}

printf("\n\n");

// 3: Check if a number is in the Fibonacci series

printf("Enter a number to check if it's in the Fibonacci series: ");

scanf("%d", &num);

int isFibonacci = 0;

for (i = 0; i < 50; i++) {

if (num == fib[i]) {

isFibonacci = 1;

break;

}

}

if (isFibonacci) {

printf("%d is in the Fibonacci series.\n\n",num);

} else {

printf("%d is not in the Fibonacci series.\n\n",num);

}

// 4: Calculate the HCF of two numbers

printf("Enter two numbers to calculate their HCF: ");

scanf("%d %d", &num1, &num2);

a = num1;

b = num2;

while (b != 0) {

temp = b;

b = a % b;

a = temp;

}

printf("HCF of %d and %d: %d\n\n", num1, num2, a);

// 5: Check if two numbers are co-prime

printf("Enter two numbers to check if they are co-prime: ");

scanf("%d %d", &num1, &num2);

a = num1;

b = num2;

while (b != 0) {

temp = b;

b = a % b;

a = temp;

}

if (a == 1) {

printf("%d and %d are co-prime.\n\n", num1, num2);

} else {

printf("%d and %d are not co-prime.\n\n", num1, num2);

}

// 6: Print all prime numbers under 100

printf("Prime numbers under 100:\n");

for (i = 2; i < 100; i++) {

isPrime = 1;

for (j = 2; j < i; j++) {

if (i % j == 0) {

isPrime = 0;

break;

}

}

if (isPrime) {

printf("%d ", i);}

}

printf("\n\n");

// 7: Print prime numbers between two numbers

printf("Enter two numbers to print prime numbers between them: ");

scanf("%d %d", &num1, &num2);

printf("Prime numbers between %d and %d:\n", num1, num2);

for (i = num1; i <= num2; i++) {

if (i < 2) {

continue;

}

isPrime = 1;

for (j = 2; j \* j <= i; j++) {

if (i % j == 0) {

isPrime = 0;

break;

}

}

if (isPrime) {

printf("%d ", i);

}

}

printf("\n\n");

// 8: Find the next prime number after a given number

printf("Enter a number to find the next prime number after it: ");

scanf("%d", &num);

nextPrime = num + 1;

while (1) {

isPrime = 1;

for (i = 2; i \* i <= nextPrime; i++) {

if (nextPrime % i == 0) {

isPrime = 0;

break;

}

}

if (isPrime) {

printf("Next prime number after %d: %d\n\n", num, nextPrime);

break;

}

nextPrime++;

}

// 9: Check if a number is an Armstrong number

printf("Enter a number to check if it's an Armstrong number: ");

scanf("%d", &num);

isArmstrong = 0;

int sum = 0;

int originalNum = num;

while (originalNum != 0) {

int digit = originalNum % 10;

sum += digit \* digit \* digit;

originalNum /= 10;

}

if (num == sum) {

isArmstrong = 1;

}

if (isArmstrong) {

printf("%d is an Armstrong number.\n\n", num);

} else {

printf("%d is not an Armstrong number.\n\n", num);

}

// 10: Print all Armstrong numbers under 1000

printf("Armstrong numbers under 1000:\n");

for (i = 1; i < 1000; i++) {

isArmstrong = 0;

int sum = 0;

int originalNum = i;

while (originalNum != 0) {

int digit = originalNum % 10;

sum += digit \* digit \* digit;

originalNum /= 10;

}

if (i == sum) {

isArmstrong = 1;

}

if (isArmstrong) {

printf("%d ", i);

}

}

printf("\n");

return 0;

}

