// Day 26: Complete Menu-Driven Programs (All 10)

#include <stdio.h>

#include <string.h>

// 1. Arithmetic Operations Menu

void arithmeticMenu() {

int a, b, choice;

printf("\n[Arithmetic Operations Menu]\nEnter two numbers: ");

scanf("%d%d", &a, &b);

printf("1.Add\n2.Subtract\n3.Multiply\n4.Divide\nChoose operation: ");

scanf("%d", &choice);

switch(choice) {

case 1: printf("Sum = %d\n", a + b); break;

case 2: printf("Difference = %d\n", a - b); break;

case 3: printf("Product = %d\n", a \* b); break;

case 4:

if(b != 0) printf("Quotient = %d\n", a / b);

else printf("Cannot divide by zero\n");

break;

default: printf("Invalid choice\n");

}

}

// 2. Even/Odd, Prime, Perfect Checker Menu

int isPrime(int n) {

if(n < 2) return 0;

for(int i = 2; i <= n/2; i++)

if(n % i == 0) return 0;

return 1;

}

int isPerfect(int n) {

int sum = 0;

for(int i = 1; i < n; i++)

if(n % i == 0) sum += i;

return sum == n;

}

void checkMenu() {

int n, ch;

printf("\n[Check Menu]\nEnter number: ");

scanf("%d", &n);

printf("1.Even/Odd\n2.Prime\n3.Perfect\nChoose check: ");

scanf("%d", &ch);

if(ch == 1)

printf(n % 2 == 0 ? "Even\n" : "Odd\n");

else if(ch == 2)

printf(isPrime(n) ? "Prime\n" : "Not Prime\n");

else if(ch == 3)

printf(isPerfect(n) ? "Perfect\n" : "Not Perfect\n");

else

printf("Invalid choice\n");

}

// 3. Number System Conversion Menu

void convertMenu() {

int n, choice;

printf("\n[Number System Conversion]\nEnter decimal number: ");

scanf("%d", &n);

printf("1.Binary\n2.Octal\n3.Hexadecimal\nChoose conversion: ");

scanf("%d", &choice);

if(choice == 1) {

printf("Binary: ");

for(int i = 31; i >= 0; i--) printf("%d", (n >> i) & 1);

printf("\n");

} else if(choice == 2) {

printf("Octal: %o\n", n);

} else if(choice == 3) {

printf("Hexadecimal: %X\n", n);

} else {

printf("Invalid choice\n");

}

}

// 4. Basic String Operations Menu

void stringMenu() {

char str[100], copy[100];

int ch, len = 0;

printf("\n[String Operations]\nEnter a string (no spaces): ");

scanf("%s", str);

printf("1.Length\n2.Reverse\n3.Copy\nChoose operation: ");

scanf("%d", &ch);

if(ch == 1) {

while(str[len] != '\0') len++;

printf("Length = %d\n", len);

} else if(ch == 2) {

len = strlen(str);

printf("Reversed: ");

for(int i = len - 1; i >= 0; i--) printf("%c", str[i]);

printf("\n");

} else if(ch == 3) {

strcpy(copy, str);

printf("Copied string: %s\n", copy);

} else {

printf("Invalid choice\n");

}

}

// 5. Armstrong, Palindrome, Strong Number Checker Menu

int isArmstrong(int n) {

int sum = 0, temp = n;

while(n > 0) {

int d = n % 10;

sum += d \* d \* d;

n /= 10;

}

return sum == temp;

}

int isPalindrome(int n) {

int rev = 0, temp = n;

while(n > 0) {

rev = rev \* 10 + n % 10;

n /= 10;

}

return rev == temp;

}

int isStrong(int n) {

int sum = 0, temp = n;

int fact[] = {1,1,2,6,24,120,720,5040,40320,362880};

while(n > 0) {

sum += fact[n % 10];

n /= 10;

}

return sum == temp;

}

void specialNumberMenu() {

int n, ch;

printf("\n[Special Number Checks]\nEnter number: ");

scanf("%d", &n);

printf("1.Armstrong\n2.Palindrome\n3.Strong\nChoose check: ");

scanf("%d", &ch);

if(ch == 1)

printf(isArmstrong(n) ? "Armstrong\n" : "Not Armstrong\n");

else if(ch == 2)

printf(isPalindrome(n) ? "Palindrome\n" : "Not Palindrome\n");

else if(ch == 3)

printf(isStrong(n) ? "Strong\n" : "Not Strong\n");

else

printf("Invalid choice\n");

}

// 6. Area Calculation Menu

void areaMenu() {

int choice;

float r, l, b, h, area;

printf("\n[Area Calculation]\n1.Circle\n2.Rectangle\n3.Triangle\nChoose shape: ");

scanf("%d", &choice);

switch(choice) {

case 1:

printf("Enter radius: ");

scanf("%f", &r);

area = 3.1416f \* r \* r;

printf("Area of circle = %.2f\n", area);

break;

case 2:

printf("Enter length and breadth: ");

scanf("%f%f", &l, &b);

area = l \* b;

printf("Area of rectangle = %.2f\n", area);

break;

case 3:

printf("Enter base and height: ");

scanf("%f%f", &b, &h);

area = 0.5f \* b \* h;

printf("Area of triangle = %.2f\n", area);

break;

default:

printf("Invalid choice\n");

}

}

// 7. Temperature Conversion Menu

void tempConvertMenu() {

int choice;

float f, c;

printf("\n[Temperature Conversion]\n1.Fahrenheit to Celsius\n2.Celsius to Fahrenheit\nChoose: ");

scanf("%d", &choice);

if(choice == 1) {

printf("Enter Fahrenheit: ");

scanf("%f", &f);

c = (f - 32) \* 5 / 9;

printf("Celsius = %.2f\n", c);

} else if(choice == 2) {

printf("Enter Celsius: ");

scanf("%f", &c);

f = (c \* 9 / 5) + 32;

printf("Fahrenheit = %.2f\n", f);

} else {

printf("Invalid choice\n");

}

}

// 8. Factorial, Power, Fibonacci Menu

int factorial(int n) {

int fact = 1;

for(int i = 2; i <= n; i++) fact \*= i;

return fact;

}

int power(int base, int exp) {

int result = 1;

for(int i = 0; i < exp; i++) result \*= base;

return result;

}

void fibonacciSeries(int n) {

int a = 0, b = 1, c;

printf("Fibonacci series: ");

for(int i = 1; i <= n; i++) {

printf("%d ", a);

c = a + b;

a = b;

b = c;

}

printf("\n");

}

void factorialPowerFiboMenu() {

int choice, n, base, exp;

printf("\n[Factorial, Power, Fibonacci]\n1.Factorial\n2.Power\n3.Fibonacci\nChoose: ");

scanf("%d", &choice);

switch(choice) {

case 1:

printf("Enter number: ");

scanf("%d", &n);

printf("Factorial = %d\n", factorial(n));

break;

case 2:

printf("Enter base and exponent: ");

scanf("%d%d", &base, &exp);

printf("Power = %d\n", power(base, exp));

break;

case 3:

printf("Enter count: ");

scanf("%d", &n);

fibonacciSeries(n);

break;

default:

printf("Invalid choice\n");

}

}

// 9. Nested If Conditions Menu

void nestedIfMenu() {

int a, b, c;

printf("\n[Nested If Conditions]\nEnter three numbers: ");

scanf("%d%d%d", &a, &b, &c);

if(a > b) {

if(a > c) printf("Largest is %d\n", a);

else printf("Largest is %d\n", c);

} else {

if(b > c) printf("Largest is %d\n", b);

else printf("Largest is %d\n", c);

}

}

// 10. Simple Login System Menu

void loginMenu() {

char username[20], password[20];

printf("\n[Login System]\nEnter username: ");

scanf("%s", username);

printf("Enter password: ");

scanf("%s", password);

// For demo, username: user, password: pass

if(strcmp(username, "user") == 0 && strcmp(password, "pass") == 0)

printf("Login successful\n");

else

printf("Login failed\n");

}