Iteration control structure

1.Using a while loop:

#include <stdio.h>

int main() {

int number = 0;

while (number <= 100) {

printf("%d ", number);

number++;

}

Using a do...while loop:

#include <stdio.h>

int main() {

int number = 0;

do {

printf("%d ", number);

number++;

} while (number <= 100);

}

Using a for loop:

#include <stdio.h>

int main() {

for (int number = 0; number <= 100; number++) {

printf("%d ", number);

}

2. #include <stdio.h>

int main() {

int totalMarks = 0;

int marks[10];

float average;

printf("Enter 10 marks:\n");

for (int i = 0; i < 10; i++) {

printf("Enter mark %d: ", i + 1);

scanf("%d", &marks[i]);

totalMarks += marks[i];

}

average = totalMarks / 10.0;

printf("Total marks: %d\n", totalMarks);

printf("Average marks: %.2f\n", average);

if (average < 50) {

printf("Fail!\n");

} else {

printf("Pass!\n");

}

3. #include <stdio.h>

int main() {

int number, i;

unsigned long long factorial = 1;

printf("Enter a positive integer: ");

scanf("%d", &number);

if (number < 0) {

printf("Error: Factorial is not defined for negative numbers.\n");

} else {

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

factorial \*= i;

}

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

}

4. #include <stdio.h>

int main() {

int number, digit, sum = 0;

printf("Enter a number: ");

scanf("%d", &number);

while (number > 0) {

digit = number % 10; // Get the last digit

sum += digit; // Add the digit to the sum

number /= 10; // Remove the last digit

}

printf("Sum of digits: %d\n", sum);

}

5. #include <stdio.h>

int main() {

int number, reversedNumber = 0, remainder;

printf("Enter a number: ");

scanf("%d", &number);

do {

remainder = number % 10; // Extracting the last digit

reversedNumber = reversedNumber \* 10 + remainder; // Building the reversed number

number /= 10; // Removing the last digit

} while (number != 0);

printf("Reversed number: %d\n", reversedNumber);

}

6. #include <stdio.h>

int main() {

int base, exponent, result = 1;

printf("Enter the base: ");

scanf("%d", &base);

printf("Enter the exponent: ");

scanf("%d", &exponent);

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

result \*= base;

}

printf("%d raised to the power of %d is %d\n", base, exponent, result);

}

7. #include <stdio.h>

int main() {

int n = 10; // Number of Fibonacci numbers to be printed

int first = 0, second = 1, next, i;

printf("Fibonacci Series: ");

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

if (i <= 1)

next = i;

else {

next = first + second;

first = second;

second = next;

}

printf("%d ", next);

}

8. #include <stdio.h>

#include <math.h>

int isArmstrong(int number) {

int originalNumber, remainder, result = 0, n = 0;

originalNumber = number;

while (originalNumber != 0) {

originalNumber /= 10;

++n;

}

originalNumber = number;

while (originalNumber != 0) {

remainder = originalNumber % 10;

result += pow(remainder, n);

originalNumber /= 10;

}

if (result == number)

return 1; // Number is an Armstrong number

else

return 0; // Number is not an Armstrong number

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

if (isArmstrong(number))

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

else

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

}

09. #include <stdio.h>

int main() {

char letter;

printf("ASCII values for letters A to Z:\n");

for (letter = 'A'; letter <= 'Z'; letter++) {

printf("%c: %d\n", letter, letter);

}

10. #include <stdio.h>

int main() {

int rows;

printf("Enter the number of rows: ");

scanf("%d", &rows);

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

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

printf("\*");

}

printf("\n");

}

11. #include <stdio.h>

int isPrime(int number) {

if (number <= 1) {

return 0; // Not a prime number

}

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

if (number % i == 0) {

return 0; // Not a prime number

}

}

return 1; // Prime number

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

if (isPrime(number)) {

printf("%d is a prime number.\n", number);

} else {

printf("%d is not a prime number.\n", number);

}

12. #include <stdio.h>

void printFactors(int number) {

printf("Factors of %d: ", number);

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

if (number % i == 0) {

printf("%d ", i);

}

}

printf("\n");

}

int main() {

int number;

printf("Enter an integer: ");

scanf("%d", &number);

printFactors(number);

}

12. #include <stdio.h>

int main() {

int number, sum = 0;

printf("Enter numbers to add (enter -1 to stop):\n");

while (1) {

scanf("%d", &number);

if (number == -1)

break;

sum += number;

}

printf("Sum: %d\n", sum);

}

13. #include <stdio.h>

int main() {

int array[10];

int i;

printf("Enter 10 integers:\n");

for (i = 0; i < 10; i++) {

printf("Enter element %d: ", i + 1);

scanf("%d", &array[i]);

}

printf("\nArray elements are: ");

for (i = 0; i < 10; i++) {

printf("%d ", array[i]);

}

14. #include <stdio.h>

int countEvenNumbers(int arr[], int size) {

int count = 0;

for (int i = 0; i < size; i++) {

if (arr[i] % 2 == 0) {

count++;

}

}

return count;

}

int main() {

int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};

int size = sizeof(arr) / sizeof(arr[0]);

int evenCount = countEvenNumbers(arr, size);

printf("The count of even numbers in the array is: %d\n", evenCount);

}