Assignment 3

Decision control

#include <stdio.h>

#include <math.h>

#include <ctype.h>

int main() {

int num, num1, num2, num3,year, month, days, marks[5];

double a, b, c;

float cost\_price, selling\_price;

char ch;

// 1: Check if a number is positive or non-positive

printf("\n1: Enter a number: ");

scanf("%d", &num);

if (num > 0) {

printf("Positive number\n");

} else if (num < 0) {

printf("Non-positive number\n");

} else {

printf("Zero\n");

}

// 2: Check if a number is divisible by 5

printf("\n2: Enter a number: ");

scanf("%d", &num);

if (num % 5 == 0) {

printf("Divisible by 5\n");

} else {

printf("Not divisible by 5\n");}

// 3: Check if a number is even or odd

printf("\n3: Enter a number: ");

scanf("%d", &num);

if (num % 2 == 0) {

printf("Even number\n");

} else {

printf("Odd number\n");

}

// 4: Check if a number is even or odd without using %

printf("\n4: Enter a number: ");

scanf("%d", &num);

if ((num & 1) == 0) {

printf("Even number\n");

} else {

printf("Odd number\n");

}

// 5: Check if a number is a three-digit number

printf("\n5: Enter a number: ");

scanf("%d", &num);

if (num >= 100 && num <= 999) {

printf("Three-digit number\n");

} else {

printf("Not a three-digit number\n");

}

// 6: Print the greater of two numbers

printf("\n6: Enter two numbers: ");

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

if (num1 > num2) {

printf("Greater number: %d\n", num1);

} else if (num2 > num1) {

printf("Greater number: %d\n", num2);

} else {

printf("Both numbers are the same: %d\n", num1);

}

// 7: Check the roots of a quadratic equation

printf("\n7: Enter coefficients (a, b, c) of the quadratic equation: ");

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

double discriminant = b \* b - 4 \* a \* c;

if (discriminant > 0) {

printf("Real and distinct roots\n");

} else if (discriminant == 0) {

printf("Real and equal roots\n");

} else {

printf("Imaginary roots\n");

}

// 8: Check if a year is a leap year

printf("\n8: Enter a year: ");

scanf("%d", &year);

if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {

printf("Leap year\n");

} else {

printf("Not a leap year\n");

}

// 9: Find the greatest among three numbers

printf("\n9: Enter three numbers: ");

scanf("%d %d %d", &num1, &num2, &num3);

if (num1 == num2 && num2 == num3) {

printf("All three numbers are equal: %d\n", num1);

} else if (num1 >= num2 && num1 >= num3) {

printf("Greatest number: %d\n", num1);

} else if (num2 >= num1 && num2 >= num3) {

printf("Greatest number: %d\n", num2);

} else {

printf("Greatest number: %d\n", num3);

}

// 10: Calculate profit or loss percentage

printf("\n10: Enter cost price and selling price: ");

scanf("%f %f", &cost\_price, &selling\_price);

if (selling\_price > cost\_price) {

float profit = selling\_price - cost\_price;

float profit\_percentage = (profit / cost\_price) \* 100;

printf("Profit percentage: %.2f%%\n", profit\_percentage);

} else if (cost\_price > selling\_price) {

float loss = cost\_price - selling\_price;

float loss\_percentage = (loss / cost\_price) \* 100;

printf("Loss percentage: %.2f%%\n", loss\_percentage);

} else {

printf("No profit, no loss\n");

}

// 11: Check if a candidate passed or failed based on marks in 5 subjects

printf("\n11: Enter marks for 5 subjects (out of 100): ");

for (int i = 0; i < 5; i++) {

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

}

int total\_marks = 0;

for (int i = 0; i < 5; i++) {

total\_marks += marks[i];

}

if (total\_marks / 5 >= 33) {

printf("Candidate passed\n");

} else {

printf("Candidate failed\n");

}

// 12: Check if a character is uppercase, lowercase, digit, or special character

printf("\n12: Enter a character: ");

scanf(" %c", &ch);

if (isupper(ch)) {

printf("Uppercase alphabet\n");

} else if (islower(ch)) {

printf("Lowercase alphabet\n");

} else if (isdigit(ch)) {

printf("Digit\n");

} else {

printf("Special character\n");

}

// 13: Check if a number is divisible by 3 and 2

printf("\n13: Enter a number: ");

scanf("%d", &num);

if (num % 3 == 0 && (num & 1) == 0) {

printf("Divisible by 3 and even\n");

} else {

printf("Not divisible by 3 and even\n");

}

// 14: Check if a number is divisible by 7 or 3

printf("\n14: Enter a number: ");

scanf("%d", &num);

if (num % 7 == 0 || num % 3 == 0) {

printf("Divisible by 7 or 3\n");

} else {

printf("Not divisible by 7 or 3\n");

}

// 15: Check if a number is positive, negative, or zero

printf("\n15: Enter a number: ");

scanf("%d", &num);

if (num > 0) {

printf("Positive number\n");

} else if (num < 0) {

printf("Negative number\n");

} else {

printf("Zero\n");

}

// 16: Check if a character is an alphabet (uppercase, lowercase), digit, or special character

printf("\n16: Enter a character: ");

scanf(" %c", &ch);

if (isalpha(ch)) {

if (isupper(ch)) {

printf("Uppercase alphabet\n");

} else {

printf("Lowercase alphabet\n");

}

} else if (isdigit(ch)) {

printf("Digit\n");

} else {

printf("Special character\n");

}

// 17: Check if a triangle with given sides is valid

printf("\n17: Enter the lengths of the sides of a triangle: ");

scanf("%d %d %d", &num1, &num2, &num3);

if (num1 + num2 > num3 && num1 + num3 > num2 && num2 + num3 > num1) {

printf("Valid triangle\n");

} else {

printf("Invalid triangle\n");

}

// 18: Display the number of days in a given month

printf("\n18: Enter a month number: ");

scanf("%d", &month);

switch (month) {

case 1: case 3: case 5: case 7: case 8: case 10: case 12:

days = 31;

break;

case 4: case 6: case 9: case 11:

days = 30;

break;

case 2:

days = 28;

break;

default:

printf("Invalid month\n");

return 1;

}

printf("Number of days in the month: %d\n", days);

return 0;

}



