1.

#include <stdio.h>

int main() {

int num, i, binary[32], index = 0;

printf("Enter an integer: ");

scanf("%d", &num);

while (num > 0) {

binary[index++] = num % 2;

num /= 2;

}

for (i = index - 1; i >= 0; i--) {

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

}

return 0;

}

Output: Enter an integer: 5

101

2.

#include <stdio.h>

int main() {

char str[100], \*ptr;

int vowels = 0, consonants = 0;

printf("Enter a string: ");

gets(str);

ptr = str;

while (\*ptr != '\0') {

if (\*ptr == 'a' || \*ptr == 'e' || \*ptr == 'i' || \*ptr == 'o' || \*ptr == 'u' ||

\*ptr == 'A' || \*ptr == 'E' || \*ptr == 'I' || \*ptr == 'O' || \*ptr == 'U') {

vowels++;

} else if ((\*ptr >= 'a' && \*ptr <= 'z') || (\*ptr >= 'A' && \*ptr <= 'Z')) {

consonants++;

}

ptr++;

}

printf("Vowels: %d\n", vowels);

printf("Consonants: %d\n", consonants);

return 0;

}

Output: Enter a string: kkj

Vowels: 0

Consonants: 3

3.

#include <stdio.h>

float add(float a, float b) { return a + b; }

float subtract(float a, float b) { return a - b; }

float multiply(float a, float b) { return a \* b; }

float divide(float a, float b) { return a / b; }

int main() {

float num1, num2;

int choice;

printf("Enter two numbers: ");

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

printf("Choose an operation:\n");

printf("1. Addition\n");

printf("2. Subtraction\n");

printf("3. Multiplication\n");

printf("4. Division\n");

scanf("%d", &choice);

switch(choice) {

case 1:

printf("Result: %.2f\n", add(num1, num2));

break;

case 2:

printf("Result: %.2f\n", subtract(num1, num2));

break;

case 3:

printf("Result: %.2f\n", multiply(num1, num2));

break;

case 4:

if (num2 != 0) {

printf("Result: %.2f\n", divide(num1, num2));

} else {

printf("Error! Division by zero.\n");

}

break;

default:

printf("Invalid choice\n");

}

return 0;

}

Output:

Enter two numbers: 6

3

Choose an operation:

1. Addition

2. Subtraction

3. Multiplication

4. Division

6

Invalid choice

4.

#include <stdio.h>

int main() {

int n, i, j;

printf("Enter the number of rows for the diamond pattern: ");

scanf("%d", &n);

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

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

printf(" ");

}

for (j = 1; j <= (2 \* i - 1); j++) {

printf("\*");

}

printf("\n");

}

for (i = n - 1; i >= 1; i--) {

for (j = n; j > i; j--) {

printf(" ");

}

for (j = 1; j <= (2 \* i - 1); j++) {

printf("\*");

}

printf("\n");

}

return 0;

}

Output:

Enter the number of rows for the diamond pattern: 3

\*

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\*

5.

#include <stdio.h>

int main() {

char str[100], \*ptr;

int length = 0;

printf("Enter a string: ");

gets(str);

ptr = str;

while (\*ptr != '\0') {

length++;

ptr++;

}

printf("Length of the string: %d\n", length);

return 0;

}

Output:

Enter a string: jjj

Length of the string: 3

6.

#include <stdio.h>

int gcd(int a, int b) {

if (b == 0)

return a;

return gcd(b, a % b);

}

int main() {

int a, b;

printf("Enter two numbers: ");

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

printf("GCD is %d\n", gcd(a, b));

return 0;

}

Output :

Enter two numbers: 15

20

GCD is 5