Day 13: Patterns - Part 1 (Stars & Numbers)

# Print a right-angled triangle of stars.

#include <stdio.h> int main() {

int rows, i, j;

printf("Enter the number of rows: "); scanf("%d", &rows);

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

printf("\* ");

}

printf("\n");

}

return 0;

}

# Print an inverted triangle of stars.

#include <stdio.h> int main() {

int rows, i, j;

printf("Enter the number of rows: "); scanf("%d", &rows);

for (i = rows; i >= 1; --i) { for (j = 1; j <= i; ++j) {

printf("\* ");

}

printf("\n");

}

return 0;

}

# Print a pyramid of stars.

#include <stdio.h>

int main() {

int rows, i, space, k = 0;

printf("Enter the number of rows: "); scanf("%d", &rows);

for (i = 1; i <= rows; ++i, k = 0) {

for (space = 1; space <= rows - i; ++space) { printf(" ");

}

while (k != 2 \* i - 1) {

printf("\* ");

++k;

}

printf("\n");

}

return 0;

}

# Print a diamond pattern using stars.

#include <stdio.h> int main() {

int rows, i, space, k = 0;

printf("Enter the number of rows (for half of the diamond): "); scanf("%d", &rows);

// Upper half of the diamond

for (i = 1; i <= rows; ++i, k = 0) {

for (space = 1; space <= rows - i; ++space) { printf(" ");

}

while (k != 2 \* i - 1) {

printf("\* ");

++k;

}

printf("\n");

}

// Lower half of the diamond

for (i = rows - 1; i >= 1; --i, k = 0) {

for (space = 1; space <= rows - i; ++space) { printf(" ");

}

while (k != 2 \* i - 1) {

printf("\* ");

++k;

}

printf("\n");

}

return 0;

}

# Print Floyd's triangle.

#include <stdio.h> int main() {

int rows, i, j, number = 1;

printf("Enter the number of rows: "); scanf("%d", &rows);

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

printf("%d ", number);

++number;

}

printf("\n");

}

return 0;

}

# Print Pascal's triangle.

#include <stdio.h>

long long factorial(int n) { long long f = 1;

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

}

return f;

}

int main() {

int rows, i, j;

printf("Enter the number of rows: "); scanf("%d", &rows);

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

for (j = 0; j <= rows - i - 2; j++) { printf(" ");

}

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

printf("%lld ", factorial(i) / (factorial(j) \* factorial(i - j)));

}

printf("\n");

}

return 0;

}

# Print a triangle of numbers (incremental).

#include <stdio.h> int main() {

int rows, i, j;

printf("Enter the number of rows: "); scanf("%d", &rows);

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

printf("%d ", j);

}

printf("\n");

}

return 0;

}

# Print a triangle of alphabets.

#include <stdio.h> int main() {

int rows, i, j;

char alphabet = 'A';

printf("Enter the number of rows: "); scanf("%d", &rows);

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

printf("%c ", alphabet);

++alphabet;

}

printf("\n");

}

return 0;

}

# Print a hollow square pattern.

#include <stdio.h> int main() {

int size, i, j;

printf("Enter the size of the square: "); scanf("%d", &size);

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

if (i == 1 || i == size || j == 1 || j == size) { printf("\* ");

} else {

printf(" ");

}

}

printf("\n");

}

return 0;

}

# Print a checkerboard pattern of 1s and 0s.

#include <stdio.h> int main() {

int rows, cols, i, j;

printf("Enter the number of rows: "); scanf("%d", &rows);

printf("Enter the number of columns: "); scanf("%d", &cols);

for (i = 0; i < rows; ++i) { for (j = 0; j < cols; ++j) {

if ((i + j) % 2 == 0) {

printf("1 ");

} else {

printf("0 ");

}

}

printf("\n");

}

return 0;

}