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\* DAY 13: PATTERNS – PART 1 (STARS & NUMBERS) \*

\* Contains 10 C programs to print various patterns. \*

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#include <stdio.h>

// ==============================

// 1. Right-Angled Triangle of Stars

// ==============================

void rightAngleStarTriangle() {

int rows;

printf("Enter number of rows: ");

scanf("%d", &rows);

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

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

printf("\* ");

}

printf("\n");

}

}

// ==============================

// 2. Inverted Triangle of Stars

// ==============================

void invertedStarTriangle() {

int rows;

printf("Enter number of rows: ");

scanf("%d", &rows);

for (int i = rows; i >= 1; i--) {

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

printf("\* ");

}

printf("\n");

}

}

// ==============================

// 3. Pyramid of Stars

// ==============================

void starPyramid() {

int rows, space;

printf("Enter number of rows: ");

scanf("%d", &rows);

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

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

printf(" ");

}

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

printf("\*");

}

printf("\n");

}

}

// ==============================

// 4. Diamond Pattern Using Stars

// ==============================

void starDiamond() {

int rows, space, i, j;

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

scanf("%d", &rows);

// Upper half

for (i = 1; i <= rows/2+1; i++) {

for (space = 1; space <= rows/2+1-i; space++) {

printf(" ");

}

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

printf("\*");

}

printf("\n");

}

// Lower half

for (i = rows/2; i >= 1; i--) {

for (space = 1; space <= rows/2+1-i; space++) {

printf(" ");

}

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

printf("\*");

}

printf("\n");

}

}

// ==============================

// 5. Floyd's Triangle

// ==============================

void floydsTriangle() {

int rows, num = 1;

printf("Enter number of rows: ");

scanf("%d", &rows);

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

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

printf("%d ", num++);

}

printf("\n");

}

}

// ==============================

// 6. Pascal's Triangle

// ==============================

void pascalsTriangle() {

int rows, coef = 1;

printf("Enter number of rows: ");

scanf("%d", &rows);

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

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

printf(" ");

}

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

if (j == 0 || i == 0)

coef = 1;

else

coef = coef \* (i - j + 1) / j;

printf("%4d", coef);

}

printf("\n");

}

}

// ==============================

// 7. Triangle of Numbers (Incremental)

// ==============================

void numberTriangle() {

int rows, num = 1;

printf("Enter number of rows: ");

scanf("%d", &rows);

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

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

printf("%d ", num++);

}

printf("\n");

}

}

// ==============================

// 8. Triangle of Alphabets

// ==============================

void alphabetTriangle() {

int rows;

char ch = 'A';

printf("Enter number of rows: ");

scanf("%d", &rows);

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

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

printf("%c ", ch++);

}

printf("\n");

}

}

// ==============================

// 9. Hollow Square Pattern

// ==============================

void hollowSquare() {

int size;

printf("Enter size: ");

scanf("%d", &size);

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

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

if (i == 1 || i == size || j == 1 || j == size)

printf("\* ");

else

printf(" ");

}

printf("\n");

}

}

// ==============================

// 10. Checkerboard Pattern (1s and 0s)

// ==============================

void checkerboard() {

int rows, cols;

printf("Enter rows and columns: ");

scanf("%d %d", &rows, &cols);

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

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

printf("%d ", (i + j) % 2);

}

printf("\n");

}

}