

```
const int WIDTH = 6;
const int HEIGHT = 3;
```

```
void whilePart1() {
    int loops = 0;
    while (loops < WIDTH) {
        print("*");
        loops++;
    }
    println();
    while (loops > HEIGHT) {
        println("*");
        loops--;
    }
    loops = WIDTH;
    while (loops > 0) {
        print("\n");
        loops--;
    }
    print("\n\n");
}

void whilePart2() {
    int i = 0;
    while (i <= WIDTH) {
        print("X");
        i++;
    }
    println();
    int row = 0;
    while (row < HEIGHT) {
        int col = 0;
        while (col <= WIDTH) {
            if (col == 0 || col == WIDTH) {
                print("Y");
            }
            else {
                print(" ");
            }
            col++;
        }
        println();
        row++;
    }
    i = 0;
    while (i <= WIDTH) {
        print("X");
        i++;
    }
    print("\n\n");
}
```

## Group Activity - Reading WHILE Loops

Solve the output of each function.

Assume necessary headers included, along with using the std namespace.

```
void whilePart3() {
    int row = 0;
    while (row < HEIGHT) {
        print("$");
        int spaces = row * 2;
        while (spaces > 0) {
            print(" ");
            spaces--;
        }
        println("$");
        row++;
    }
    row = HEIGHT - 1;
    while (row >= 0) {
        print("$");
        int spaces = row * 2;
        while (spaces > 0) {
            print(" ");
            spaces--;
        }
        println("$");
        row--;
    }
    print("\n\n");
}

void whilePart4() {
    const int NUM_BIG = 4;
    const int BIG_COUNT = 2;
    int row = 0;
    while (row <= NUM_BIG) {
        print("Z");
        if (row % BIG_COUNT == 0) {
            int i = 0;
            while (i < WIDTH) {
                print("Z");
                i++;
            }
        }
        println();
        row++;
    }
}
```

## Group Activity - Reading FOR Loops

Solve the output of each function.

```
#include <print>
using namespace std;

const int WIDTH = 5;
const int HEIGHT = 5;

void forPart1()
{
    for (int row = 0; row < HEIGHT; row++) {
        for (int col = 0; col < WIDTH; col++) {
            bool isDiag = col == row;
            bool isLorR = col == 0 || col == WIDTH - 1;
            if (isDiag || isLorR) {
                print("#");
            }
            else {
                print(" ");
            }
        }
        println();
    }
}
```

```
void forPart2()
{
    for (int i = 0; i < WIDTH; i++) {
        print("@");
    }
    println();
    for (int row = 1; row < HEIGHT - 1; row++) {
        for (int j = 0; j < WIDTH / 2; j++) {
            print(" ");
        }
        println("@");
    }
    for (int i = 0; i < WIDTH; i++) {
        print("@");
    }
    println();
}
```

```
void forPart3()
{
    for (int i = 0; i < WIDTH; i++) {
        print("?");
    }
    println();
    for (int row = 1; row < HEIGHT - 1; row++) {
        println("?");
    }
    for (int i = 0; i < WIDTH; i++) {
        print("?");
    }
    println();
}
```

```
void forPart4()
{
    for (int row = 0; row < HEIGHT; row++) {
        print("X");
        bool isTorB = row == 0 || row == HEIGHT - 1;
        if (isTorB || row == HEIGHT / 2) {
            for (int i = 1; i < WIDTH; i++) {
                print("X");
            }
        }
        println();
    }
}
```

```
int main()
{
    forPart1();
    println();
    forPart2();
    println();
    forPart3();
    println();
    forPart4();
}
```