

## Cody Problem 18. Bullseye Matrix

Given  $n$  (always odd), return output  $a$  that has concentric rings of the numbers 1 through  $(n+1)/2$  around the center point.

Examples:

```
% Input  n = 3
% Output a is [ 2 2 2
%              2 1 2
%              2 2 2 ]
% Input  n = 5
% Output a is [ 3 3 3 3 3
%              3 2 2 2 3
%              3 2 1 2 3
%              3 2 2 2 3
%              3 3 3 3 3 ]
```

### Scratch Pad

```
n = 3;
```

```
bullseye(n)
```

```
ans = 3x3
```

```
2     2     2
2     1     2
2     2     2
```

```
n = 5;
```

```
bullseye(n)
```

```
ans = 5x5
```

```
3     3     3     3     3
3     2     2     2     3
3     2     1     2     3
3     2     2     2     3
3     3     3     3     3
```

```
n = 9;
```

```
bullseye(n)
```

```
ans = 9x9
```

```
5     5     5     5     5     5     5     5     5
5     4     4     4     4     4     4     4     5
5     4     3     3     3     3     3     4     5
5     4     3     2     2     2     3     4     5
5     4     3     2     1     2     3     4     5
5     4     3     2     2     2     3     4     5
```

5	4	3	3	3	3	3	4	5
5	4	4	4	4	4	4	4	5
5	5	5	5	5	5	5	5	5

## Solution

```
function a = bullseye(n)
    if mod(n, 2) == 0
        error('n should be an odd number.');
```

```
    end

    bullseye = ones(n, n);
    center = (n + 1) / 2;

    for i = 1:center-1
        bullseye(center - i, center - i : center + i) = i + 1;
        bullseye(center + i, center - i : center + i) = i + 1;
        bullseye(center - i : center + i, center - i) = i + 1;
        bullseye(center - i : center + i, center + i) = i + 1;
    end
    a = bullseye;
end
```