C - MULTIDIMENSIONAL ARRAYS

2D ARRAYS - DYNAMIC ALLOCATION

```
int *mat = (int *) malloc(nrows*ncols*sizeof(int));
```

- One contiguous block of memory
- Can't use [][] notation:
- Can use [] notation
- Pointer arithmetic to handle rows and columns

2D ARRAYS - DYNAMIC ALLOCATION

```
int **mat = (int **) malloc(nrows*sizeof(int *));
for (int i=0; i<nrows; i++) {
    *(mat+i) = (int *) malloc(ncols*sizeof(int));
}
```

- Could also use `mat[i]` inside the loop
- Can use [][] notation now
- No longer one contiguous block of memory

2D ARRAYS - DYNAMIC ALLOCATION

```
int *A = (int *) malloc(nrows*ncols*sizeof(int));
int **mat = (int **) malloc(nrows*sizeof(int *));
for (int i=0; i<nrows; i++) {
    mat[i] = A + i*ncols
}
```

- Allows use of [][] notation
- Meomory for actual entries is contiguous

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