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Week 8

Linked Lists

Before we begin

Assignment 2

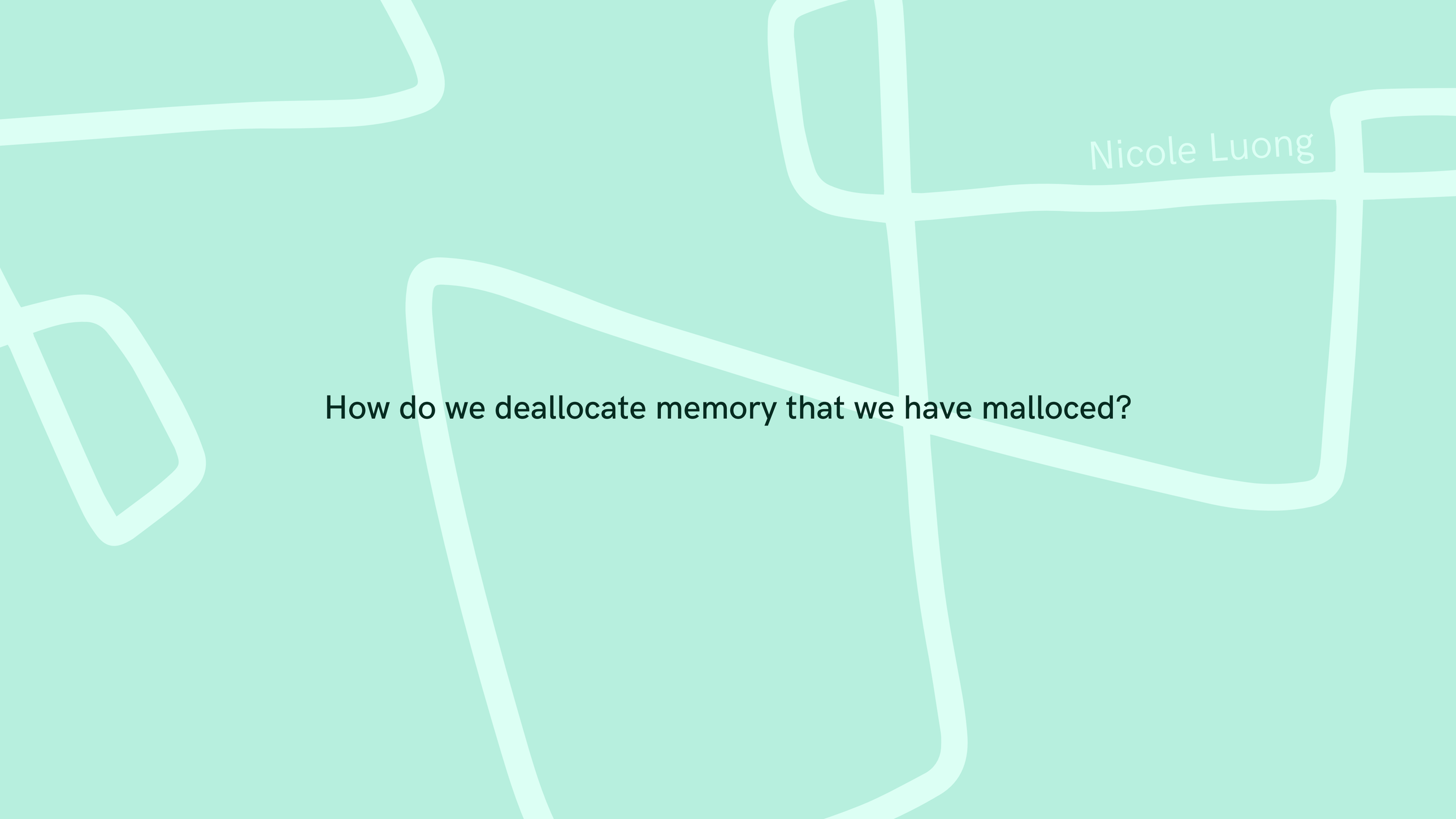
How many bytes of memory is needed for ints/doubles/chars?

Malloc

What is it?

What values do we give it?

What does it return?



How do we deallocate memory that we have malloced?

Malloc - Group Activity

How can we use malloc to allocate memory to the following?

1. An integer
2. A double
3. A character
4. An array of 10 characters
5. The following struct:

```
struct my_struct {
        int number;
        char letter;
        double another_number;
}
```

Linked Lists

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

```
struct node {
    int data;
    struct node *next;
};
```

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node,
   called node1

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2
6. Set node2 data to 9

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2
6. Set node2 data to 9
7. Set node2 next to null

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2
6. Set node2 data to 9
7. Set node2 next to null
8. Insert node2 to the tail of the list, making node1 next, point to node2

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2
6. Set node2 data to 9
7. Set node2 next to null
8. Insert node2 to the tail of the list, making node1 next, point to node2
9. Malloc memory for a new node, called node3

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2
6. Set node2 data to 9
7. Set node2 next to null
8. Insert node2 to the tail of the list, making node1 next, point to node2
9. Malloc memory for a new node, called node3
10. Set node3 data to 5

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2
6. Set node2 data to 9
7. Set node2 next to null
8. Insert node2 to the tail of the list, making node1 next, point to node2
9. Malloc memory for a new node, called node3
10. Set node3 data to 5
11. Set node3 next to null

Linked Lists - Drawing Activity

Draw a diagram to visualise the following instructions

1. Malloc memory for a new node, called node1
2. Set node1 data to 3
3. Set node1 next to null
4. Make a head pointer, which points to node1
5. Malloc memory for a new node, called node2
6. Set node2 data to 9
7. Set node2 next to null
8. Insert node2 to the tail of the list, making node1 next, point to node2
9. Malloc memory for a new node, called node3
10. Set node3 data to 5
11. Set node3 next to null
12. Insert node3 to the head of the list.

Linked Lists Coding

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Lab Time!