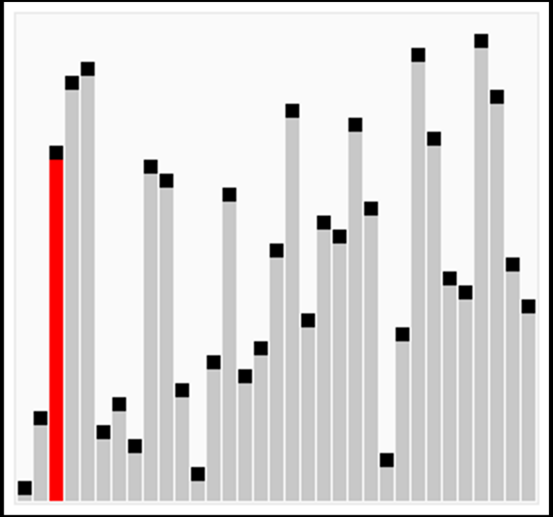
Which sorting algorithm is this?



In a file on your IDE, create a ”person” struct with attributes name and age. Then, in int main(void), create an array of 2 persons. Iterate through the array and print each name and age.

CS50 Section 3

- Searching and Running Times
- Structs
- Sorting
- Recursion

Runtime

- Best Case?

- Worst Case?

Searching

- Linear Search

1 2 3 4 5 6 7 8

Searching and Run Times

- Linear Search

1 2 3 4 5 6 7 8

- Best Case?
- Worst Case?

Searching and Run Times

- Binary Search – Let’s look for the number 12.

5	10	12	23	40	50	62

Searching and Run Times

- Binary Search – Let’s look for the number 12.

5	10	12				

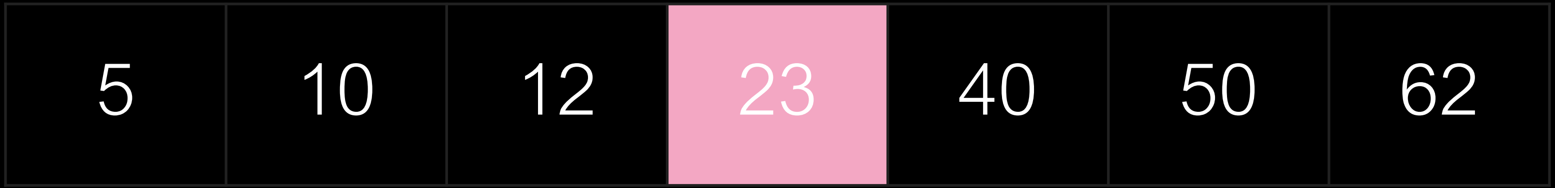
Searching and Run Times

- Binary Search – Let’s look for the number 12.

		12				

Searching and Run Times

- ○ Binary Search – Let’s look for the number 12.



5	10	12	23	40	50	62

- ○ Best Case?
- ○ Worst Case?

- Searching and Running Times
- Structs
- Sorting
- Recursion

Structs

```
typedef struct
{
    string name;
    int age;
}
person;
```

Structs

```
typedef struct

{

    string name;

    int age;

}

person;
```

```
person p;

p.name = “Phyllis”;

p.age = 19;
```

Why a struct?

Exercise 1: Struct Practice

```
typedef struct
{
    string name;
    int age;
}
person;
```

Construct a struct called “birthday” that contains a variable *name* as a *string,* the variable *month* as an *int,* and the variable *day* as an *int.*

Create an array storing birthdays, initialize your contents, and print the contents of your array.

- Searching and Running Times
- Structs
- Sorting
- Recursion

Bubble Sort

3	6	1	4	7	8	2	5

Bubble Sort

1	2	3	4	5	6	7	8

Bubble Sort

3	6	1	4	7	8	2	5

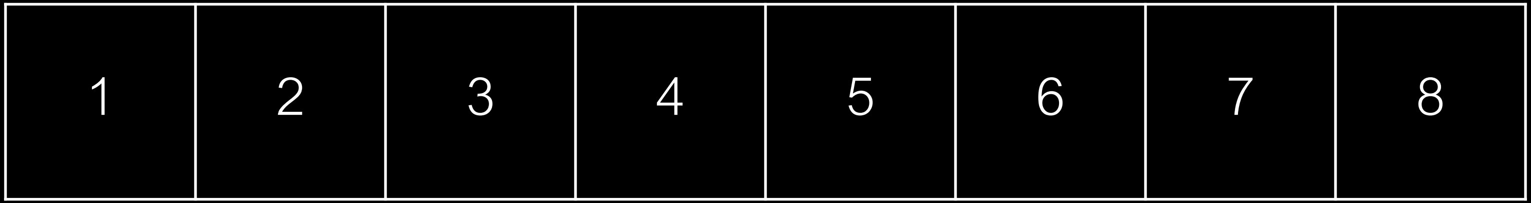
- Best Case?

- Worst Case?

Selection Sort

3	6	1	4	7	8	2	5

Selection Sort



1	2	3	4	5	6	7	8

Selection Sort

3	6	1	4	7	8	2	5

- Best Case?
- Worst Case?

Selection Sort

Merge Sort

3	6	1	4	7	8	2	5

Merge Sort

1	2	3	4	5	6	7	8

Merge Sort

3	6	1	4	7	8	2	5

- Best Case?
- Worst Case?

Fun Sorts :D

3	6	1	4	7	8	2	5

Stalin Sort (fake sort vibes)

3	6	1	4	7	8	2	5

Stalin Sort (fake sort vibes)

3	6	1	4	7	8	2	5

- ○ Best Case?
- ○ Worst Case?

Bogosort Sort

3	6	1	4	7	8	2	5

Summary

- Searching and Running Times
- Structs
- Sorting
- Recursion

Recursion

- ○ Base Case
- ○ Recursive Call

Write a function that prints integers starting from n line by line, subtracting one for each line until zero is reached using recursion.

Recursion

```
void count(n)
{
    if (n == 0)
    {
        return;
    }
    count_up_to(n - 1);
    printf("%i\n", n);
}
```

Recursion

- Base Case
- Recursive Call

Write a function that determines the factorial of an integer n using recursion. Prompt the user for an integer and print out its factorial.

Exercise 2: Fibonacci Numbers

Write a recursive function *fib* that computes the nth Fibonacci number. The 0th Fibonacci number is 0, the 1st Fibonacci number is 1, and every subsequent Fibonacci number is the sum of the two preceding Fibonacci numbers.

fib(7) returns 13

Lab

CS50 Section 3