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#include <stdio.h>

#include <stdlib.h>

#include <unistd.h>

#include <sys/wait.h>
```

```
// Function to perform Bubble Sort
```

```
void bubbleSort(int arr[], int n) {
    int i, j, temp;
    for(i = 0; i < n-1; i++) {
        for(j = 0; j < n-i-1; j++) {
            if(arr[j] > arr[j+1]) {
                temp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = temp;
            }
        }
    }
}
```

```
// Function to perform Selection Sort
```

```
void selectionSort(int arr[], int n) {
    int i, j, min, temp;
    for(i = 0; i < n-1; i++) {
        min = i;
        for(j = i+1; j < n; j++) {
            if(arr[j] < arr[min])
                min = j;
        }
        temp = arr[min];
        arr[min] = arr[i];
        arr[i] = temp;
    }
}
```

```
}  
}
```

```
int main() {  
    int n, i;  
    printf("Enter number of integers: ");  
    scanf("%d", &n);  
  
    int arr[n];  
    printf("Enter %d integers: ", n);  
    for(i = 0; i < n; i++)  
        scanf("%d", &arr[i]);  
  
    pid_t pid = fork();  
  
    if(pid < 0) {  
        printf("Fork failed!\n");  
        exit(1);  
    }  
    else if(pid == 0) { // Child process  
        printf("\nChild Process (PID: %d)\n", getpid());  
        printf("Sorting using Selection Sort...\n");  
        selectionSort(arr, n);  
  
        printf("Child Process Sorted Array: ");  
        for(i = 0; i < n; i++)  
            printf("%d ", arr[i]);  
        printf("\n");  
  
        printf("\nChild process completed. Going to sleep for 5 seconds...\n");  
        sleep(5); // To demonstrate Zombie state
```

```

    printf("Child exiting now.\n");
    exit(0);
}
else { // Parent process
    printf("\nParent Process (PID: %d), Child PID: %d\n", getpid(), pid);
    printf("Sorting using Bubble Sort...\n");
    bubbleSort(arr, n);

    printf("Parent Process Sorted Array: ");
    for(i = 0; i < n; i++)
        printf("%d ", arr[i]);
    printf("\n");

    printf("\nParent sleeping for 10 seconds to observe zombie state...\n");
    sleep(10); // Child will become zombie during this time

    int status;
    wait(&status); // Collect child's exit status
    printf("Parent collected child process using wait().\n");
}

return 0;
}

```

nano fork\_sort.c

gcc fork\_sort.c -o fork\_sort

./fork\_sort

input

Enter number of integers: 5

Enter 5 integers: 9 3 5 1 7

output

Parent Process (PID: 2205), Child PID: 2206

Sorting using Bubble Sort...

Parent Process Sorted Array: 1 3 5 7 9

Parent sleeping for 10 seconds to observe zombie state...

Child Process (PID: 2206)

Sorting using Selection Sort...

Child Process Sorted Array: 1 3 5 7 9

Child process completed. Going to sleep for 5 seconds...

Child exiting now.

(After 10 seconds)

Parent collected child process using wait().