CSE-2202: Algorithm

Lab Assignment-01

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Problem 1: Binary Search

```
#include <stdio.h>
              int main()
           - {
             int i, low, high, mid, n, key, array[100];
             printf("Enter number of elements");
             scanf("%d", &n);
             printf("Enter %d integers", n);
             for(i = 0; i < n; i++)
             scanf("%d", &array[i]);
             printf("Enter value to find");
             scanf("%d", &key);
             low = 0;
             high = n - 1;
             mid = (low+high)/2;
             while (low <= high) {
             if(array[mid] < key)</pre>
             low = mid + 1;
            else if (array[mid] == key) {
             printf("%d found at location %d.", key, mid+1);
             break;
             - }
             else
C:\Users\Enamul\Documents\binary_searchUntitled1.exe
Enter number of elements 5
Enter 5 integers 10 20 30 40 50
Enter value to find 30
30 found at location 3.
Process returned 0 (0x0) execution time : 10.799 s
Press any key to continue.
```

Problem 2: Selection sort

```
Start nere A | pinary_searchUntitled i.c A | selection_softOntitled2.c A
     1
            // C program for implementation of selection sort
     2
            #include <stdio.h>
     3
     4
           void swap(int *xp, int *yp)
     5
     6
                int temp = *xp;
     7
                *xp = *yp;
     8
                *yp = temp;
     9
    10
    11
           void selectionSort(int arr[], int n)
    12
    13
               int i, j, min idx;
    14
    15
                // One by one move boundary of unsorted subarray
                for (i = 0; i < n-1; i++)
    16
    17
    18
                    // Find the minimum element in unsorted array
    19
                    min idx = i;
                    for (j = i+1; j < n; j++)
    20
    21
                    if (arr[j] < arr[min idx])</pre>
    22
                        min idx = j;
    23
<
Start here X binary_searchUntitled1.c X selection_sortUntitled2.c X
     25
                      if(min idx != i)
     26
                          swap(&arr[min idx], &arr[i]);
     27
     28
     29
             /* Function to print an array */
     30
     31
            void printArray(int arr[], int size)
           - {
     32
     33
                 int i;
     34
                  for (i=0; i < size; i++)
     35
                      printf("%d ", arr[i]);
                 printf("\n");
     36
     37
     38
     39
             // Driver program to test above functions
     40
            int main()
           ⊟{
     41
                  int arr[] = {64, 25, 12, 22, 11};
     42
     43
                  int n = sizeof(arr)/sizeof(arr[0]);
     44
                  selectionSort(arr, n);
                 printf("Sorted array: \n");
     45
     46
                 printArray(arr, n);
     47
                 return 0.
```

```
Start here
        ■ C:\Users\Enamul\Documents\selection_sortUntitled2.exe
                                                                                      \times
    28
       Sorted array:
    29
       11 12 22 25 64
    30
    31
       Process returned 0 (0x0) execution time : 0.041 s
    32
       Press any key to continue.
    33
    34
    35
    36
    37
    38
    39
    40
    41
    42
                int arr[] = {64, 25, 12, 22, 11};
    43
                int n = sizeof(arr)/sizeof(arr[0]);
    44
                selectionSort(arr, n);
               printf("Sorted array: \n");
    45
    46
               printArray(arr, n);
    47
                return 0;
    48
    49
```