Design and Analysis of Algorithm
RCA 352: Session 2020-21
DAA Lab
Experiment-No.1

Objective: Implement the selection sort algorithm to sort the given list of N numbers and plot graph.

Scheduled Date:	Compiled Date:	Submitted Date:
10/09/2020	10/09/2020	7/11/2020

Algorithm:

Selection_sort(Input: Array A, Size N)

N: Number of values to be sort

A: Array of Size N

Temp, Pass,J ,min

1. for pass= 1 to n-1.

2. min=i-1.

3. for j=1 to n-1.

4. if(a[j]<a[min])

5. min=j;

6. end of for loop.

7. Temp=A[min].

8. A[min]=A[pass-1].

9. A[pass-1]=Temp.

10. end of for loop.

```c
#include<stdio.h>
int count;


void swap(int *x, int *y)
```

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```c
{
  int temp;
  count++;
  temp=*x;
  count++;
  *x=*y;
  count++;
  *y=temp;
  count++;
}
void selectionSort(int a[],int range)
{
  int i,j,k;
  count++;
  for (i = 0; i < range-1; i += 1)
  {
    count++;
    for (j =k=i; j < range; j += 1)
    {
      count++;
      if (a[j]<a[k])
      {
        count++;
        k=j;
      }
    }
    count++;
    swap(&a[i],&a[k]);
  }
}

void main()
```

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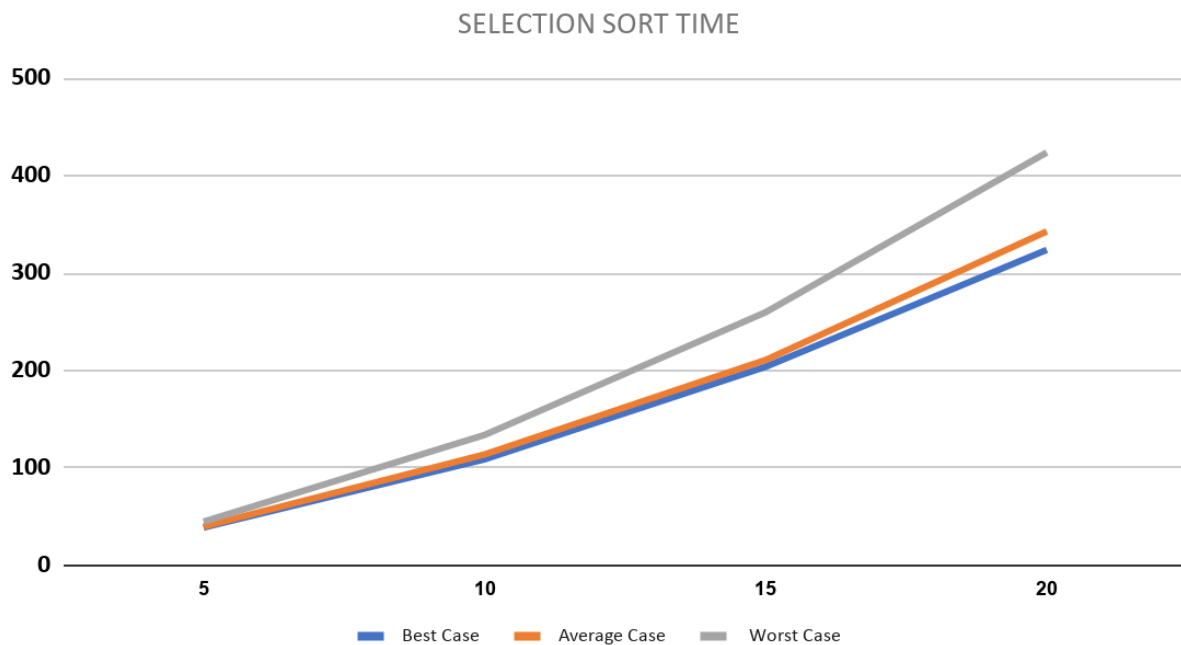## Department of Computer Applications
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```c
{
  int a[100],range,i;


  scanf("%d",&range);
  for (i = 0; i < range; i += 1)
  {
    scanf("%d",&a[i]);
  }
  selectionSort(a,range);
  for (i = 0; i < range; i += 1)
  {
    printf("%d ",a[i]);
  }
  printf("Count = %d",count);
}
```

Output

Input Size	Best Case	Average Case	Worst Case
5	39	40	45
10	109	114	134
15	204	211	260
20	324	343	424

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Graph:

SELECTION SORT TIME

Best Case   Average Case   Worst Case

Conclusion

Case	Running Time : Growth of Function mathematically	Running Time : Growth of Function after observing graph
Best Case	$O(n^2)$	$O(n^2)$
Average Case	$O(n^2)$	$O(n^2)$
Worst Case	$O(n^2)$	$O(n^2)$