

## CS 210 Sorting

### Selection Sort

```
#include<stdio.h>
#include<stdlib.h>
#include<time.h>
void SelectionSort(int d[], int n);
void Swap(int *x, int *y);
void FindMin(int d[], int n, int start, int *minIndx);
int main()
{
    int i;
    int data[100];
    srand(23);
    for(i=0;i<100;i++)
        data[i] = rand() % 101;
    for(i=0;i<100;i++)
        printf("%d, ", data[i]);
    printf("\n\n");
    SelectionSort(data, 100);
    for(i=0;i<100;i++)
        printf("%d, ", data[i]);
    printf("\n");
}
void SelectionSort(int d[], int n)
{int i, j, swpCnt, minIndx;
  swpCnt = 0;
  for(i=0;i<n-1;i++)
      {for(j=i;j<n;j++)
        {FindMin(d, n, i, &minIndx);
         Swap(&d[i], &d[minIndx]);
         swpCnt++;
        }
      }
  printf("Selection sort done with %d swaps.\n", swpCnt);
}
void FindMin(int d[], int n, int start, int *minIndx)
{int i;
 *minIndx = start;
 for(i=start;i<n;i++)
     {if(d[i] < d[*minIndx])
      *minIndx = i;
     }
}
void Swap(int *a, int *b)
{int tmp;
 tmp = *a;
 *a = *b;
 *b = tmp;
}
```

# Bubble Sort

```
#include<stdio.h>
#include<stdlib.h>
#include<time.h>
void BubbleSort(int d[], int n);
void Swap(int *x, int *y);
int main()
{
    int i;
    int data[100];
    srand(23);
    for(i=0;i < 100;i++)
        data[i] = rand() % 101;
    for(i=0;i < 100;i++)
        printf("%d, ", data[i]);
    printf("\n\n");
    BubbleSort(data, 100);
    for(i=0;i < 100;i++)
        printf("%d, ", data[i]);
    printf("\n");
}
void BubbleSort(int d[], int n)
{int i, swpCnt, fDone;
  fDone = 0;
  swpCnt = 0;
  while(!fDone)
      {fDone = 1;
        for(i=0;i<n-1;i++)
            {if(d[i] > d[i+1])
              {Swap(&d[i], &d[i+1]);
                fDone = 0;
                swpCnt++;
              }
            }
        }
    printf("Bubble sort done with %d swaps.\n", swpCnt);
}
void Swap(int *a, int *b)
{int tmp;
  tmp = *a;
  *a = *b;
  *b = tmp;
}
```