# LAPORAN

**Algoritma dan Struktur Data**

A logo with a yellow and blue design

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1. Listing Latihan
2. Menggunakan bubble and shell dengan struct
3. Program

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| --- |
| #include <stdio.h>  #include <stdlib.h>  #include <string.h>  #define MAX 10  typedef struct{  int no;  char nama[MAX];  int nilai;  }siswa;  int i, j, c, m, s, n=0, kondisi=0, did\_swap=1;  typedef char x;  void backup\_struct (siswa[], siswa[]);  void insertion (int, int, siswa[]);  void selection (int, int, siswa[]);  void bubble (int, int, siswa[]);  void shell (int, int, siswa[]);  void c\_m\_s ();  void input (siswa []);  void tampil (siswa []);  void menu ();  void cek\_menu (int, int, int, siswa []);  void insertion ();  void selection ();  void tukar (siswa \*, siswa \*);  int main (){  siswa data\_awal[MAX];  input(data\_awal);  menu(data\_awal);  }  void menu(siswa data\_awal[]){  int pilih1, pilih2, pilih3;  siswa data\_ubah[n];  while (pilih1 != 5){  c = 0, m = 0, s = 0;  backup\_struct(data\_awal, data\_ubah);  puts ("MENU METODE SORTING");  puts ("1. Insertion Sort");  puts ("2. Selection Sort");  puts ("3. Bubble");  puts ("4. Shell");  puts ("5. Keluar");  printf ("Pilihan anda [1/2/3/4/5]: ");  scanf ("%d", &pilih1);  if (pilih1 != 5){  puts ("Pengurutan yang dipilih");  puts ("1. Ascending");  puts ("2. Descanding");  printf ("Pilihan anda [1/2]: ");  scanf ("%d", &pilih2);  puts("Pengurutan berdasarkan");  puts ("1. No");  puts ("2. Nama");  puts ("3. Nilai");  printf ("Pilihan anda [1/2/3]: ");  scanf ("%d", &pilih3);  printf ("Data sebelum diproses : ");  tampil (data\_ubah);  cek\_menu (pilih1, pilih2, pilih3, data\_ubah);  printf ("Data setelah diproses : ");  tampil (data\_ubah);  puts ("");  }  }  }  void input (siswa data[]){  char lagi = 'y';  while (lagi == 'y' || lagi == 'Y'){  puts ("INPUT");  printf ("No : ");  scanf ("%d", &data[n].no);  printf ("Nama : ");  getchar();  gets (data[n].nama);  printf ("Nilai : ");  scanf ("%d", &data[n].nilai);  getchar();  printf ("Lagi [y/t]? : ");  lagi = getchar();  n++;  puts ("");  }  }  void backup\_struct (siswa data\_awal[], siswa data\_ubah[]){  for (i=0; i<n; i++){  data\_ubah[i] = data\_awal[i];  }  }  void cek\_menu (int menu1, int menu2, int menu3, siswa data[]){  switch (menu1){  case 1:  insertion(menu2, menu3, data);  break;  case 2:  selection(menu2, menu3, data);  break;  case 3:  bubble (menu2, menu3, data);  break;  case 4:  shell (menu2, menu3, data);  break;  default:  exit(0);  }  }  void insertion (int jenis, int urut, siswa data[]){  siswa key[n];  for (i=1; i<n; i++){  j = i-1;  key[i] = data[i];  m++;  while (j>=0){  if(jenis == 1){  switch (urut){  case 1:  kondisi = key[i].no < data[j].no;  break;  case 2:  kondisi = strcmpi(key[i].nama, data[j].nama)<0;  break;  case 3:  kondisi = key[i].nilai < data[j].nilai;  }  }  else  switch (urut){  case 1:  kondisi = key[i].no > data[j].no;  break;  case 2:  kondisi = strcmpi(key[i].nama, data[j].nama)>0;  break;  case 3:  kondisi = key[i].nilai > data[j].nilai;  }  if (kondisi){  data[j+1] = data[j];  m++;  c++;  j--;  }  else  break;  }  data[j+1] = key[i];  m++;  }  }  void selection (int jenis, int urut, siswa data[]){  int maxmin;  for (i=0; i<n-1; i++){  maxmin = i;  j = i+1;  while (j < n){  if (jenis==1) // maxmin = nilai minimum  {  switch (urut){  case 1:  kondisi = data[j].no < data[maxmin].no;  break;  case 2:  kondisi = strcmpi (data[j].nama, data[maxmin].nama) < 0;  break;  case 3:  kondisi = data[j].nama < data[maxmin].nama;  break;  }  }  else // maxmin = nilai maximum  {  switch (urut){  case 1:  kondisi = data[j].no > data[maxmin].no;  break;  case 2:  kondisi = strcmpi (data[j].nama, data[maxmin].nama) > 0;  break;  case 3:  kondisi = data[j].nama > data[maxmin].nama;  break;  }  }  if (kondisi){  maxmin = j;  }  j++;  c++;  }  tukar (&data[maxmin], &data[i]);  s++;  }  }  void bubble (int jenis, int urut, siswa data[]){  int batas = n-1;  for (i=0; i<n-1; i++){  did\_swap = 1;  if (did\_swap){  did\_swap = 0;  for (j=0; j<batas; j++){  if (jenis == 1){  switch (urut){  case 1:  kondisi = data[j].no > data[j+1].no;  break;  case 2:  kondisi = strcmpi (data[j].nama, data[j+1].nama) > 0;  break;  case 3:  kondisi = data[j].nama > data[j+1].nama;  break;  }  }  else {  switch (urut){  case 1:  kondisi = data[j].no < data[j+1].no;  break;  case 2:  kondisi = strcmpi (data[j].nama, data[j+1].nama) > 0;  break;  case 3:  kondisi = data[j].nama < data[j+1].nama;  break;  }  }  if (kondisi){  tukar(&data[j], &data[j+1]);  did\_swap = 1;  s++;  }  c++;  }  batas--;  }  }  }  void shell(int jenis, int urut, siswa data[]){  int jarak = n/2;  while (jarak >= 1){  did\_swap = 1;  while (did\_swap){  did\_swap = 0;  for (i=0; i<n-jarak; i++){  if (jenis == 1){  switch (urut){  case 1:  kondisi = data[j].no < data[jarak+1].no;  break;  case 2:  kondisi = strcmpi (data[j].nama,data[jarak+1].nama) < 0;  break;  case 3:  kondisi = data[j].nama < data[jarak+1].nama;  break;  }  }  else {  switch (urut){  case 1:  kondisi = data[j].no > data[jarak+1].no;  break;  case 2:  kondisi = strcmpi (data[j].nama, data[jarak+1].nama) > 0;  break;  case 3:  kondisi = data[j].nama > data[jarak+1].nama;  break;  }  }  if (kondisi){  tukar(&data[i], &data[jarak+i]);  did\_swap = 1;  s++;  }  c++;  }  }  jarak /= 2;  }  }  void tukar (siswa \*x, siswa \*y){  siswa temp;  temp = \*x;  \*x = \*y;  \*y = temp;  m += 3;  }  void tampil (siswa data[]){  puts("");  puts ("\tData yang terdaftar");  puts ("No\tNama\tNilai");  puts ("----------------------------------------");  for (i=0; i<n; i++){  printf ("%d\t%s\t%d\n", data[i].no, data[i].nama, data[i].nilai);  }  c\_m\_s ();  }  void c\_m\_s (){  printf ("Hasil compare : %d\n", c);  printf ("Hasil movement : %d\n", m);  printf ("Hasil swap : %d\n", s);  } |

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