Praktikum Struktur Data

Tanggal Praktikum : 15 September 2021

1. Buatlah fungsi untuk menghitung jumlah node dalam sebuah linked list! (looping sama seperti pada saat menampilkan nilai dari linked list).

1.Struktur Data - 4penugasan1.c

```c
#include <stdio.h>
#include <stdlib.h>

struct simpul
{
    int nilai;
    struct simpul *selanjutnya;
};
typedef struct simpul *pointersimpul;

void main()
{
    pointersimpul head = NULL;
    head = (pointersimpul)malloc(sizeof(struct simpul));

    head->nilai = 10;
    head->selanjutnya = NULL;

    pointersimpul buatsimpul(int input)
    {
        pointersimpul x = (pointersimpul)malloc(sizeof(struct simpul));
        x->nilai = input;
        x->selanjutnya = NULL;
    }
    pointersimpul dua = buatsimpul(20);
    head->selanjutnya = dua;

    pointersimpul tiga = buatsimpul(76);
    dua->selanjutnya = tiga;

    void hitungsimpul(head)
    {
        struct simpul *i = head;
        int j = 1;
        while (i != NULL)
        {
            printf("Nilai node ke-%d = %d\n", j, i->nilai);
            i = i->selanjutnya;
            j = j + 1;
        }
        printf("Total semua node = %d\n", j - 1);
    }
    hitungsimpul(head);
    system("pause");
}
```

Output yang dihasilkan

```
Nilai node ke-1 = 10
Nilai node ke-2 = 20
Nilai node ke-3 = 76
Total semua node = 3
Press any key to continue . . .
```

2. Buatlah fungsi untuk membalik nilai dari head ke tail!

1.Struktur Data - 4penugasan2.c

```c
#include <stdio.h>
#include <stdlib.h>

struct node
{
    int value;
    struct node *next;
};

typedef struct node *ptrnode;

void main()
{

    struct node node_dua;
    ptrnode dua = &node_dua;

    ptrnode head = (ptrnode)malloc(sizeof(struct node));
    ptrnode tiga = (ptrnode)malloc(sizeof(struct node));
    ptrnode empat = (ptrnode)malloc(sizeof(struct node));
    ptrnode lima = (ptrnode)malloc(sizeof(struct node));

    head->value = 1;
    head->next = dua;
    dua->value = 2;
    dua->next = tiga;
    tiga->value = 3;
    tiga->next = empat;
    empat->value = 4;
    empat->next = lima;
    lima->value = 5;
    lima->next = NULL;

    printf("\nIsi dari linked list : ");
    struct node *n = head;
    while (n != NULL)
    {
        printf("%d, ", n->value);
        n = n->next;
    }

    struct node *sebelum = NULL;
    struct node *setelah = NULL;
    struct node *current = head;
    while (current != NULL)
    {
        setelah = current->next;
        current->next = sebelum;
        sebelum = current;
        current = setelah;
    }
    head = sebelum;
    printf("\nIsi dari linked list : ");
    struct node *q = head;
    while (q != NULL)
    {
        printf("%d, ", q->value);
        q = q->next;
    }
    system("pause");
}
```

Output yang dihasilkan

```
Isi dari linked list : 1, 2, 3, 4, 5,
Isi dari linked list : 5, 4, 3, 2, 1,
```

3. Buat program untuk menyimpan data students berisi int nim, char nama[50] secara dinamis!

1.Struktur Data - 4penugasan3.c

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

struct node
{
    int value;
    char nama[50];
    struct node *next;
};

typedef struct node *ptrnode;

void main()
{

    struct node node_dua;
    ptrnode dua = &node_dua;

    ptrnode head = (ptrnode)malloc(sizeof(struct node));
    ptrnode tiga = (ptrnode)malloc(sizeof(struct node));
    ptrnode empat = (ptrnode)malloc(sizeof(struct node));
    ptrnode lima = (ptrnode)malloc(sizeof(struct node));

    head->value = 20988212;
    head->next = dua;
    strcpy(head->nama, "andy warhol");
    dua->value = 20982312;
    dua->next = tiga;
    strcpy(dua->nama, "Hector Salamanca");
    tiga->value = 20388212;
    tiga->next = empat;
    strcpy(tiga->nama, "Gustavo Fring");
    empat->value = 20988216;
    empat->next = lima;
    strcpy(empat->nama, "Hank Schrader");
    lima->value = 20982212;
    lima->next = NULL;
    strcpy(lima->nama, "Skinny Pete");

    printf("====================================\n");
    printf("  NIM\t\t     Nama\n");
    printf("====================================\n");

    struct node *n = head;
    while (n != NULL)
    {
        printf("%d\t%s \n", n->value, n->nama);
        n = n->next;
    }
}
```

Output yang dihasilkan

```
==================================
  NIM                Nama
==================================
20988212         andy warhol
20982312         Hector Salamanca
20388212         Gustavo Fring
20988216         Hank Schrader
20982212         Skinny Pete
```