

Tölvutækni og Forritun heimadæmi 3

brj46

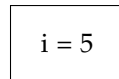
September 2024

1

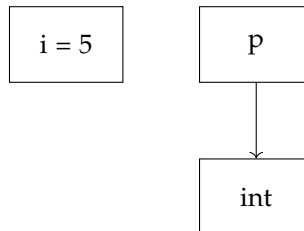
Skoðum forritsbútinn:

```
int i = 5;  
int *p = (int *)malloc(sizeof(int));  
int *q = &i;  
*p = *q;  
q = p;
```

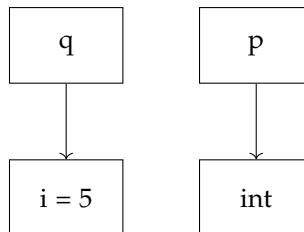
1.



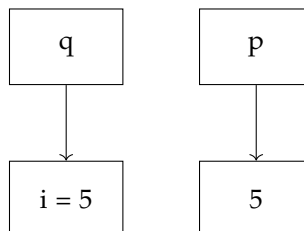
2.



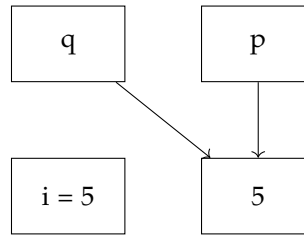
3.



4.



5.



2

a)

Kóðinn að inc.c

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

int main(int argc, char **argv) {
    int inntala;

    while (scanf("%d", inntala) != EOF) {
        inntala++;
        printf("%d\n", inntala);
    }
    return 0
}
```

```
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ nano inc.c
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ gcc inc.c -o inc
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ cat inn.txt | ./inc
5
9
21
4
13
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$
```

b)

Kóði fyrir forritið incx.c

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

int main(int argc, char **argv){
    int inntala;
    int x;
    x = atoi(argv[1]);
    while(scanf("%d", &inntala) != EOF) {
        inntala += x;
        printf("%d\n", inntala);
    }
    return 0;
}
```

```
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ nano incx.c
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ gcc incx.c -o incx
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ cat inn.txt | ./incx 5
9
13
25
8
17
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$
```

3

Forritskóðinn:

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

    int* newArr = (int *)calloc(2 * n, sizeof(int));

    for (int i = 0; i < n; i++){
        newArr[i] = a[i];
    }

    free(a);

    return newArr;
}

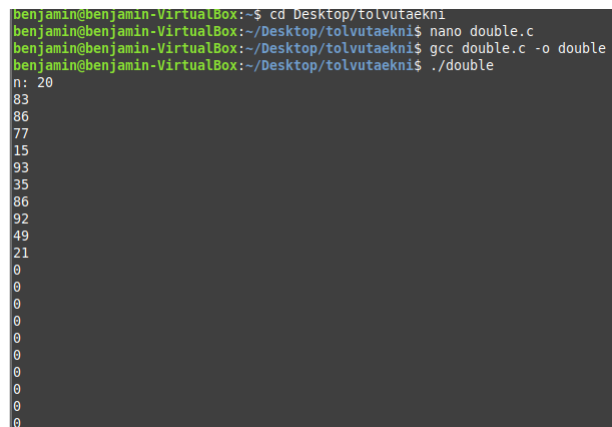
int main() {
    int i;
    int n = 10;

    int *a = (int *)calloc(n, sizeof(int));
    for(i = 0; i < n; i++)
        a[i] = rand()%100;

    a = doubleArr(a, n);
    n *= 2;

    printf("n: %d\n", n);
    for (i = 0; i < n; i++)
        printf("%d\n", a[i]);
    return 0;
}
```

Skjáskot af keyrslu:



```
benjamin@benjamin-VirtualBox:~$ cd Desktop/tolvutaekni
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ nano double.c
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ gcc double.c -o double
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ ./double
n: 20
83
86
77
15
93
35
86
92
49
21
0
0
0
0
0
0
0
0
0
0
```

4

Kóðinn:

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

int main(int argc, char *argv[]){
    int heildarLengd = 0;
    int i;

    for(i = 1; i < argc, i++){
        heildarLengd += strlen(argv[i]);
    }

    char *concatArg = (char *)malloc(heildarLengd + 1);

    concatArg[0] = '\0';

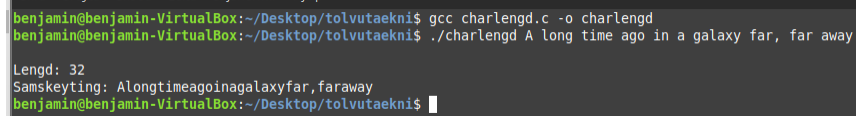
    for (i = 1; i < argc; i++){
        strcat(concatArg, argv[i]);
    }

    printf("Lengd: %d\n", heildarLengd);
    printf("Samskeyting: %s\n", concatArg);

    free(concatArg);

    return 0;
}
```

Skjáskot af keyrslu:



```
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ gcc charlengd.c -o charlengd
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$ ./charlengd A long time ago in a galaxy far, far away

Lengd: 32
Samskeyting: Alongtimeagoinagalaxyfar, faraway
benjamin@benjamin-VirtualBox:~/Desktop/tolvutaekni$
```

5

a)

```
void printRevList() {
    struct dNode *p = tail;

    printf ("ofugur Listi: ");
    while(p != NULL){
        printf("%d ", p-> data);
        p = p->prev;
    }

    printf("\n");
}
```

b)

```
void insAs(int k, int v) {
    struct dNode *p, *q;
    int i;

    p = (struct dNode *)malloc(sizeof(struct dNode));
    p->data = v;

    if (head == NULL) {
        p->prev = NULL;
        p->next = NULL;
        head = tail = p;
    } else if (k == 0) {
        p->prev = NULL;
        p->next = head;
        head->prev = p;
        head = p;
    } else {
        q = head;
        for( i = 0; i < k -1 && q->next != NULL; i++){
            q = q->next;
        }
        if (q->next == NULL){
            p->next = NULL;
            p->prev = tail;
            tail->next = p;
            tail = p;
        } else {
            p->next = q->next;
            p->prev = q;
            if(q->next != NULL){
                q->next->prev = P;
            }
            q->next = p;
        }
    }
}
```

Skjáskot af keyrslu:

```
benjamin@benjamin-VirtualBox:~$ cd Desktop/tolvutækni
benjamin@benjamin-VirtualBox:~/Desktop/tolvutækni$ nano dlist.c
benjamin@benjamin-VirtualBox:~/Desktop/tolvutækni$ gcc dlist.c -o dlist
benjamin@benjamin-VirtualBox:~/Desktop/tolvutækni$ ./dlist
Listi: 83 86 77 15 93
Ófugur Listi: 93 15 77 86 83

Setja 10 sem stak 0:
Listi: 10 83 86 77 15 93
Setja 20 sem stak 10:
Listi: 10 83 86 77 15 93 20
Setja 30 sem stak 3:
Listi: 10 83 86 30 77 15 93 20
benjamin@benjamin-VirtualBox:~/Desktop/tolvutækni$
```