# OS LAB WEEK6

Name: Sagnik Chatterjee
Roll No :61
Sec : B
REg: 180905478

Q1.
Codes:
q1_reader.c

```
/*
AUTHOR : SAGNIK CHATTERJEE
DATE : DEC 15,2020
USAGE : ./q1r

*/

#include <stdio.h>
#include <stdlib.h>
#include <sys/ipc.h>
#include <sys/msg.h>
#include <string.h>

#define max 256

struct msg_buffer {
    long mesg_type;
    char mesg_text[100];
} message;

int reverseDigits(int num)
{
```

```
        int rev_num = 0;
        while (num > 0) {
        rev_num = rev_num * 10 + num % 10;
        num = num / 10;
        }
        return rev_num;
}

int isPalindrome(int n)
{
    int rev_num = reverseDigits(n);

        if (rev_num == n)
        return 1;
        else
        return 0;
}


int main() {
    key_t key;
    int msgid;

    //ftok to generate unique key
    key = ftok("progfile", 65);

    //msgget creates a message queue
    //and returns  indentifer
    msgid = msgget(key, 0666 | IPC_CREAT);

    //msgrev to receive message
    msgrcv(msgid, &message, sizeof(message), 1, 0);
```

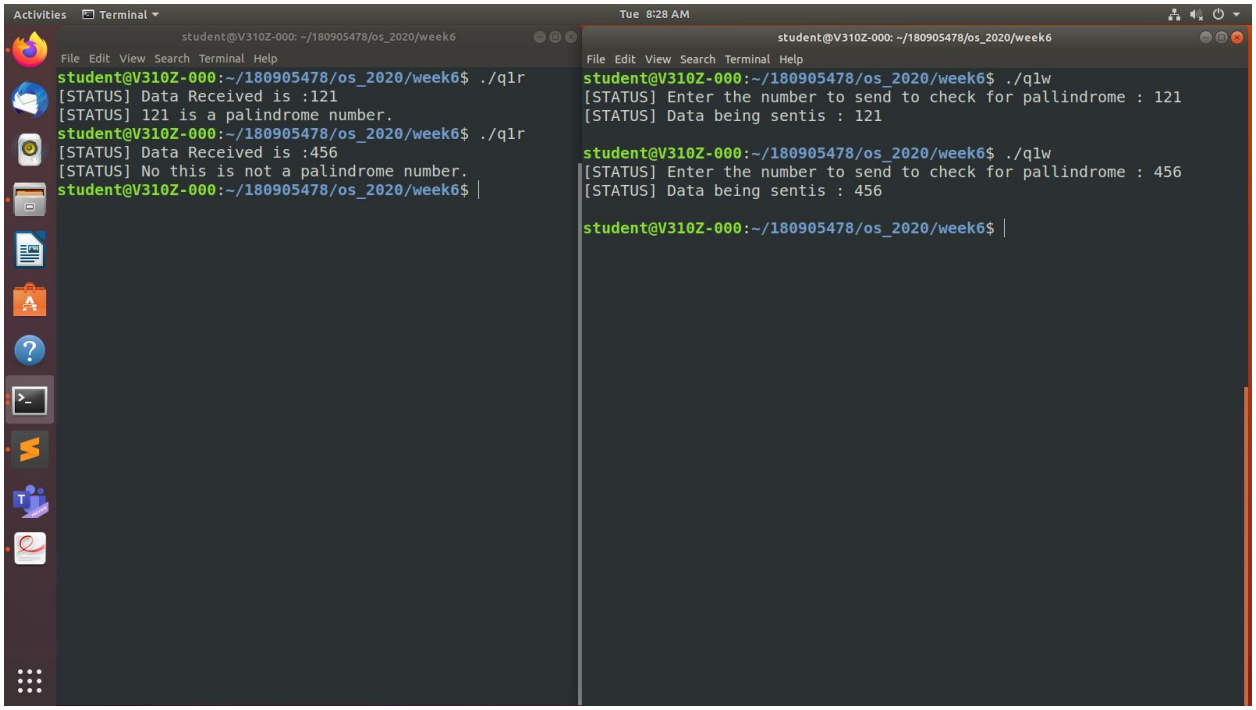
```
    //check if the messagedata is pallindrome or not

    int number = atoi(message.mesg_text);
    printf("[STATUS] Data Received is :%d\n", number);
    if (isPalindrome(number)==1) {
        //yes this is a palindrome
        printf("[STATUS] %d is a palindrome number.\n",number);
    }
    else {
        printf("[STATUS] No this is not a palindrome number.\n");
    }
    //destroy the message queue
    msgctl(msgid, IPC_RMID, NULL);
    return 0;
}
```

q1_writer.c

```
/*
AUTHOR : SAGNIK CHATTERJEE
DATE : DEC 15,2020
USAGE : ./q1w

*/

#include <stdio.h>
#include <stdlib.h>
#include <sys/ipc.h>
#include <sys/msg.h>

#define max 256
```

```
struct msg_buffer {
    long mesg_type;
    char mesg_text[100];
} message;

int main() {
    key_t key;
    int msgid;

    // ftok to generate unique key
    key = ftok("progfile", 65);

    // msgget creates a message queue
    // and returns identifier
    msgid = msgget(key, 0666 | IPC_CREAT);
    message.mesg_type = 1;

    printf("[STATUS] Enter the number to send to check for pallindrome
: ");
    fgets(message.mesg_text, max, stdin);

    // msgsnd to send message
    msgsnd(msgid, &message, sizeof(message), 0);

    // display the message
    printf("[STATUS] Data being sentis : %s \n", message.mesg_text);

    return 0;
}
```

Screenshot:




Q2

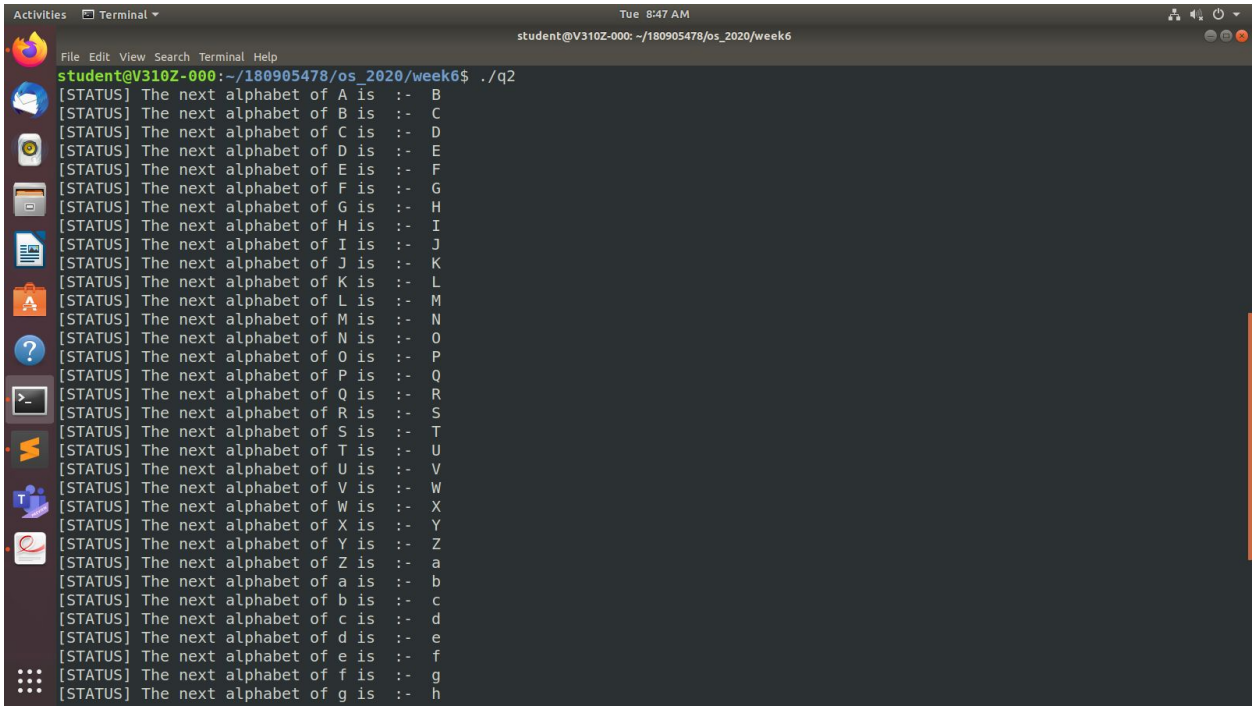
Code:

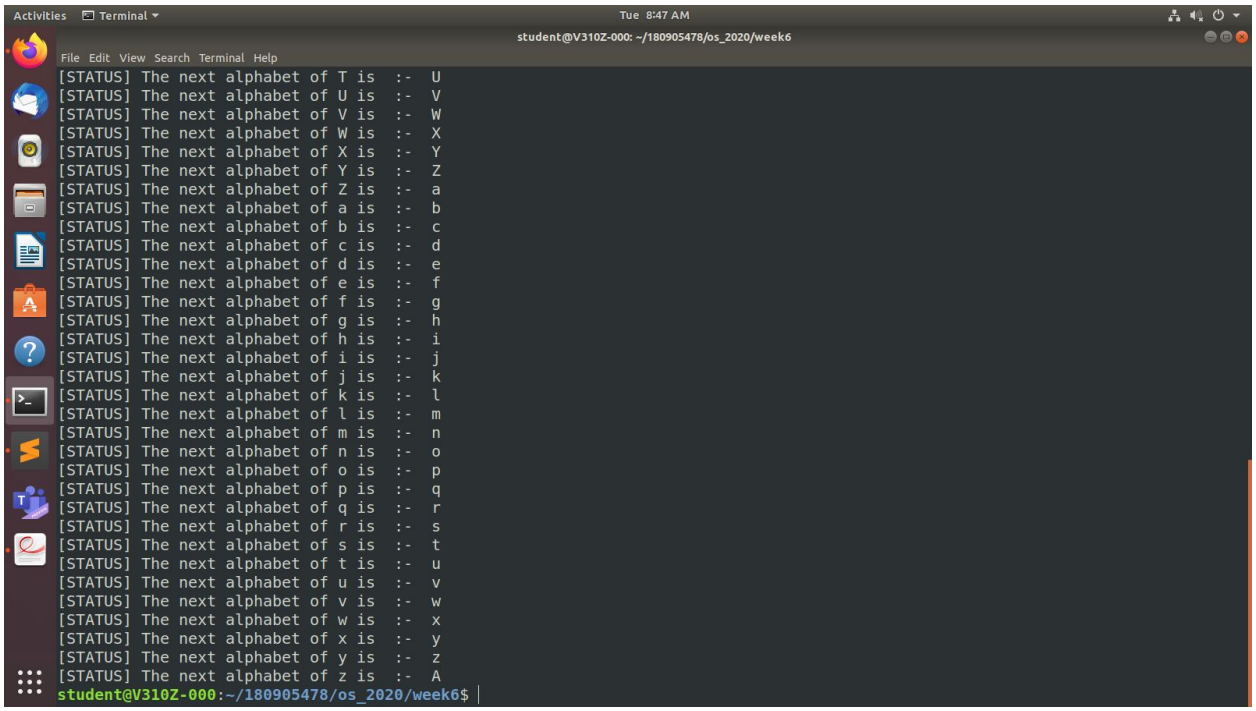
```
/*

AUTHOR :SAGNIK CHATTERJEE
DATE : DEC 15,2020
USAGE : ./q2

*/

#include <stdio.h>
#include <stdlib.h>
#include <sys/shm.h>
#include <sys/stat.h>
#include <sys/wait.h>
#include <unistd.h>
```

```
#include <sys/types.h>

#define size 2 //because only allphabet sent

void nextalphabet(char *alphabet){
    char *next= (char*)calloc(2,sizeof(char));
    next[1]='\0';
    //handle corner cases of Z and z
    if(*alphabet=='Z'){
        next[0]='a';
    }
    else if(*alphabet=='z'){
        next[0]='A';
    }
    //for other characters handle
    else {
        next[0]=*alphabet+1;
    }
    *alphabet=*next;
}

int main(){
    int segment_id = shmget(IPC_PRIVATE, size, S_IRUSR |
S_IWUSR);
    if(segment_id<0){
        printf("[ERROR] shmget error. \n");
        exit(1);
    }

    char *shared_memory = (char *)shmat(segment_id, NULL, 0);
    *shared_memory = '\0';
```

```
    pid_t pid;
    int i;
    *shared_memory = 'A';//from the first english alphabet

    for (i = 0; i < 52; ++i) {
        pid = fork();

        if(pid<0){
            printf("[ERROR] fork error \n");
            exit(1);
        }

        if (pid == 0) {//for child process get the next alphabet
            while (*shared_memory == '\0');
            nextalphabet(shared_memory);
            exit(0);
        } else {
            //for parent process prints the next alphabet
            //after the chracter has been incremented in the child
process
            printf("[STATUS] The next alphabet of %s is  :-  ",
shared_memory);
            wait(NULL);
            printf("%s\n", shared_memory);
        }
    }
    //close the shared_memory
    shmdt(shared_memory);
}
```

Screenshot:


Activities
Terminal
Tue 8:47 AM
student@V310Z-000: ~/180905478/os_2020/week6
File Edit View Search Terminal Help
student@V310Z-000:~/180905478/os_2020/week6$ ./q2
[STATUS] The next alphabet of A is :- B
[STATUS] The next alphabet of B is :- C
[STATUS] The next alphabet of C is :- D
[STATUS] The next alphabet of D is :- E
[STATUS] The next alphabet of E is :- F
[STATUS] The next alphabet of F is :- G
[STATUS] The next alphabet of G is :- H
[STATUS] The next alphabet of H is :- I
[STATUS] The next alphabet of I is :- J
[STATUS] The next alphabet of J is :- K
[STATUS] The next alphabet of K is :- L
[STATUS] The next alphabet of L is :- M
[STATUS] The next alphabet of M is :- N
[STATUS] The next alphabet of N is :- O
[STATUS] The next alphabet of O is :- P
[STATUS] The next alphabet of P is :- Q
[STATUS] The next alphabet of Q is :- R
[STATUS] The next alphabet of R is :- S
[STATUS] The next alphabet of S is :- T
[STATUS] The next alphabet of T is :- U
[STATUS] The next alphabet of U is :- V
[STATUS] The next alphabet of V is :- W
[STATUS] The next alphabet of W is :- X
[STATUS] The next alphabet of X is :- Y
[STATUS] The next alphabet of Y is :- Z
[STATUS] The next alphabet of Z is :- a
[STATUS] The next alphabet of a is :- b
[STATUS] The next alphabet of b is :- c
[STATUS] The next alphabet of c is :- d
[STATUS] The next alphabet of d is :- e
[STATUS] The next alphabet of e is :- f
[STATUS] The next alphabet of f is :- g
[STATUS] The next alphabet of g is :- h


Activities
Terminal
Tue 8:47 AM
student@V310Z-000: ~/180905478/os_2020/week6
File Edit View Search Terminal Help
[STATUS] The next alphabet of T is :- U
[STATUS] The next alphabet of U is :- V
[STATUS] The next alphabet of V is :- W
[STATUS] The next alphabet of W is :- X
[STATUS] The next alphabet of X is :- Y
[STATUS] The next alphabet of Y is :- Z
[STATUS] The next alphabet of Z is :- a
[STATUS] The next alphabet of a is :- b
[STATUS] The next alphabet of b is :- c
[STATUS] The next alphabet of c is :- d
[STATUS] The next alphabet of d is :- e
[STATUS] The next alphabet of e is :- f
[STATUS] The next alphabet of f is :- g
[STATUS] The next alphabet of g is :- h
[STATUS] The next alphabet of h is :- i
[STATUS] The next alphabet of i is :- j
[STATUS] The next alphabet of j is :- k
[STATUS] The next alphabet of k is :- l
[STATUS] The next alphabet of l is :- m
[STATUS] The next alphabet of m is :- n
[STATUS] The next alphabet of n is :- o
[STATUS] The next alphabet of o is :- p
[STATUS] The next alphabet of p is :- q
[STATUS] The next alphabet of q is :- r
[STATUS] The next alphabet of r is :- s
[STATUS] The next alphabet of s is :- t
[STATUS] The next alphabet of t is :- u
[STATUS] The next alphabet of u is :- v
[STATUS] The next alphabet of v is :- w
[STATUS] The next alphabet of w is :- x
[STATUS] The next alphabet of x is :- y
[STATUS] The next alphabet of y is :- z
[STATUS] The next alphabet of z is :- A
student@V310Z-000:~/180905478/os_2020/week6$