Exp No: 5 Date: 17/09/2020

DAYTIME SERVER USING UDP

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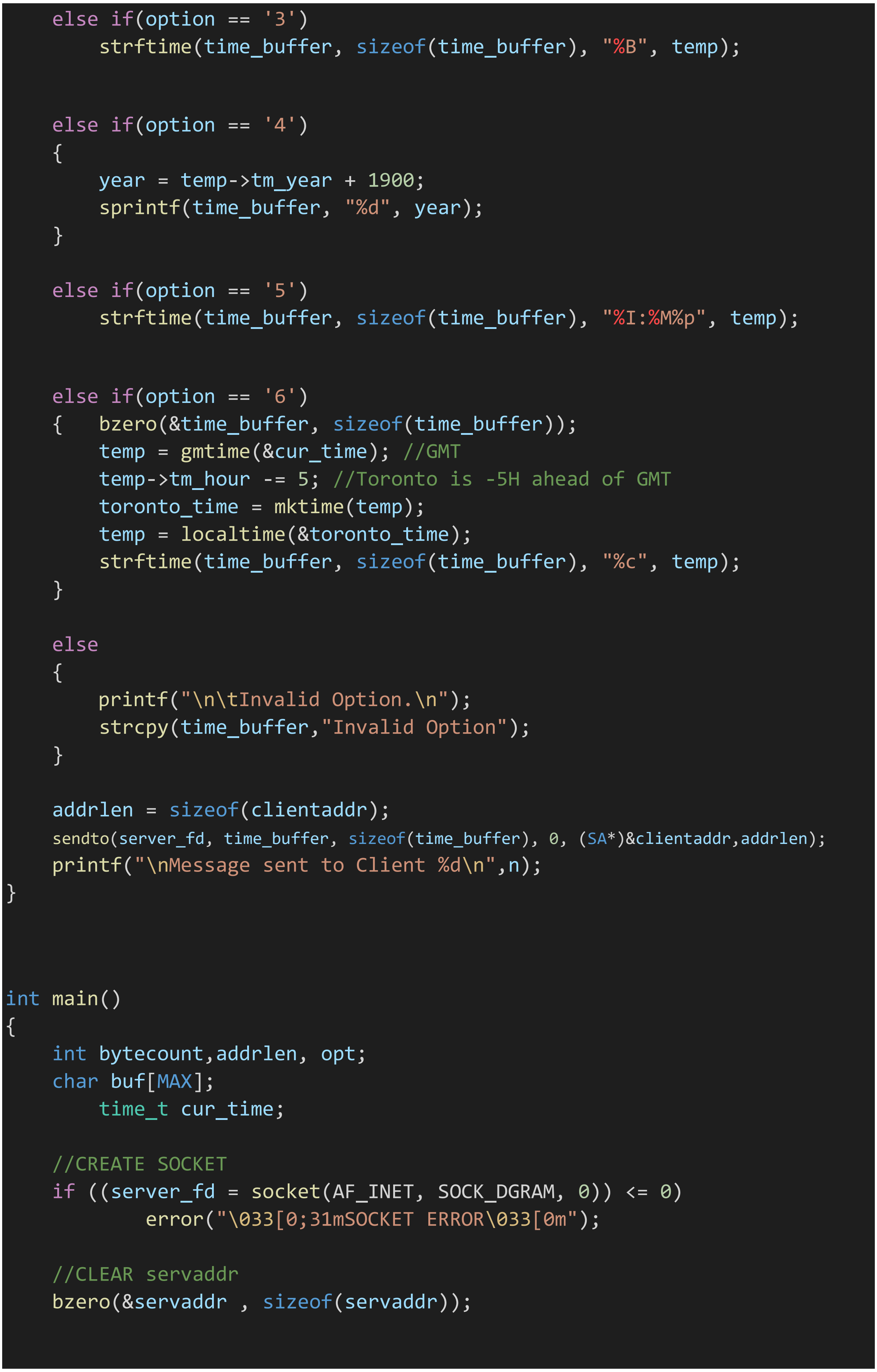
Code:

SERVER.C

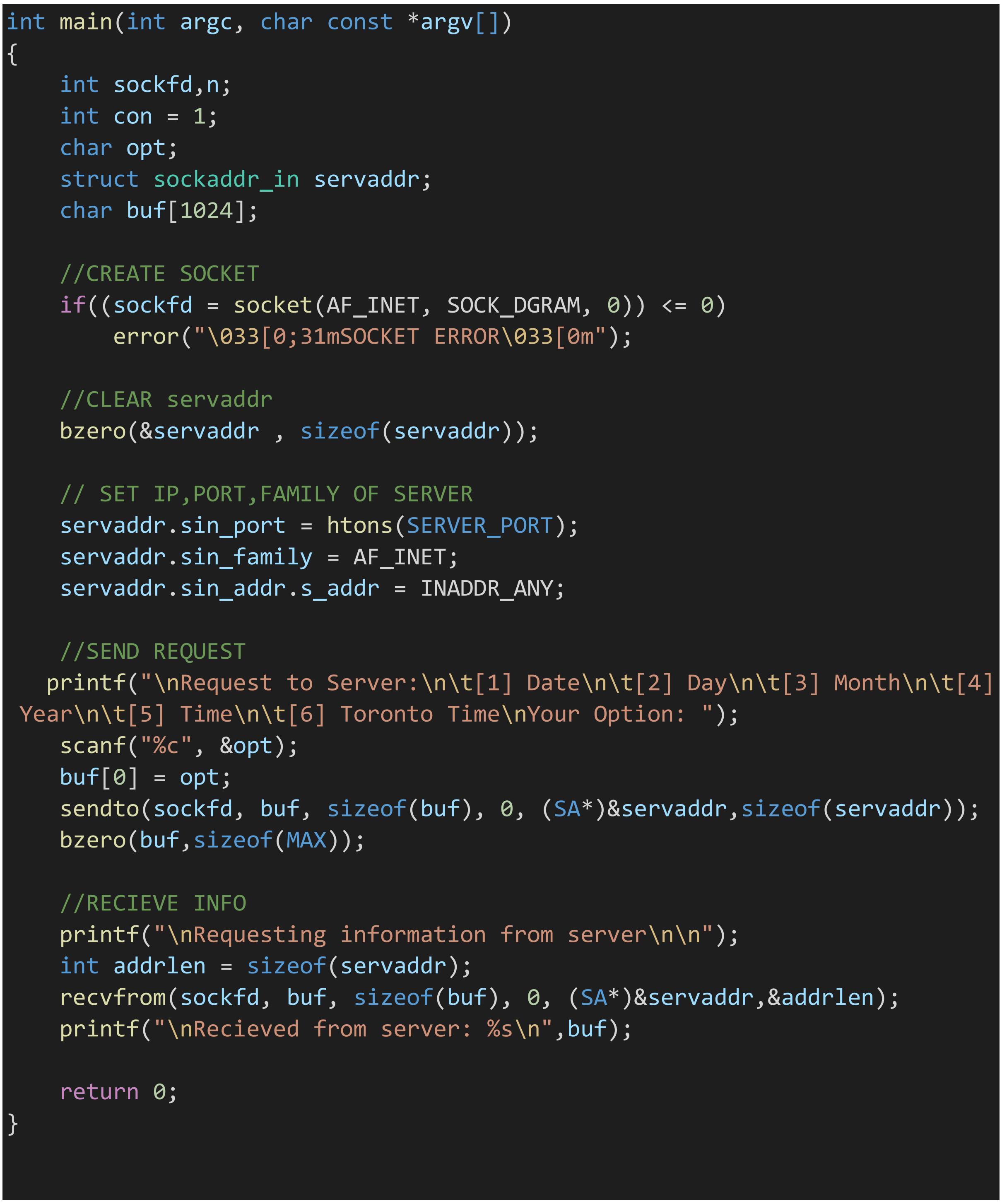
```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <time.h>
#include <unistd.h>
#include <fcntl.h>
#include <arpa/inet.h>

#define SA struct sockaddr
#define SERVER_PORT 8000
#define MAX 256

int server_fd,n = 1;
struct sockaddr_in servaddr, clientaddr;


int error(char *msg)
{
    perror(msg);
    exit(1);
}


void ansOption(time_t cur_time, char option)
{
        struct tm *temp;
    time_t toronto_time;
    char time_buffer[MAX];
    int addrlen,year;

    temp = localtime(&cur_time);
    printf("\nRequest from Client %d: Option %c\n",n,option);

    if(option == '1')
        strftime(time_buffer, sizeof(time_buffer), "%x", temp);

    else if(option == '2')
        strftime(time_buffer, sizeof(time_buffer), "%A", temp);
```



```
    else if(option == '3')
        strftime(time_buffer, sizeof(time_buffer), "%B", temp);


    else if(option == '4')
    {
        year = temp->tm_year + 1900;
        sprintf(time_buffer, "%d", year);
    }

    else if(option == '5')
        strftime(time_buffer, sizeof(time_buffer), "%I:%M%p", temp);


    else if(option == '6')
    {   bzero(&time_buffer, sizeof(time_buffer));
        temp = gmtime(&cur_time); //GMT
        temp->tm_hour -= 5; //Toronto is -5H ahead of GMT
        toronto_time = mktime(temp);
        temp = localtime(&toronto_time);
        strftime(time_buffer, sizeof(time_buffer), "%c", temp);
    }

    else
    {
        printf("\n\tInvalid Option.\n");
        strcpy(time_buffer,"Invalid Option");
    }

    addrlen = sizeof(clientaddr);
    sendto(server_fd, time_buffer, sizeof(time_buffer), 0, (SA*)&clientaddr,addrlen);
    printf("\nMessage sent to Client %d\n",n);
}



int main()
{
    int bytecount,addrlen, opt;
    char buf[MAX];
        time_t cur_time;

    //CREATE SOCKET
    if ((server_fd = socket(AF_INET, SOCK_DGRAM, 0)) <= 0)
            error("\033[0;31mSOCKET ERROR\033[0m");

    //CLEAR servaddr
    bzero(&servaddr , sizeof(servaddr));
    // SET IP,PORT,FAMILY OF SERVER
    servaddr.sin_port = htons(SERVER_PORT);
    servaddr.sin_family = AF_INET;
    servaddr.sin_addr.s_addr = INADDR_ANY;

    //BIND
    if((bind(server_fd, (SA*)&servaddr, sizeof(servaddr))) !=0 )
            error("\033[0;31mBIND ERROR\033[0m");


    //RECIEVE DATA
    addrlen = sizeof(clientaddr);

    while(1)
    {
            bzero(buf,sizeof(buf));
        bytecount = recvfrom(server_fd, buf, sizeof(buf), 0,(SA*)&clientaddr, &addrlen);
        cur_time = time(NULL);
        ansOption(cur_time,buf[0]);
        n++;
    }

    return 0;
}
```

CLIENT.C

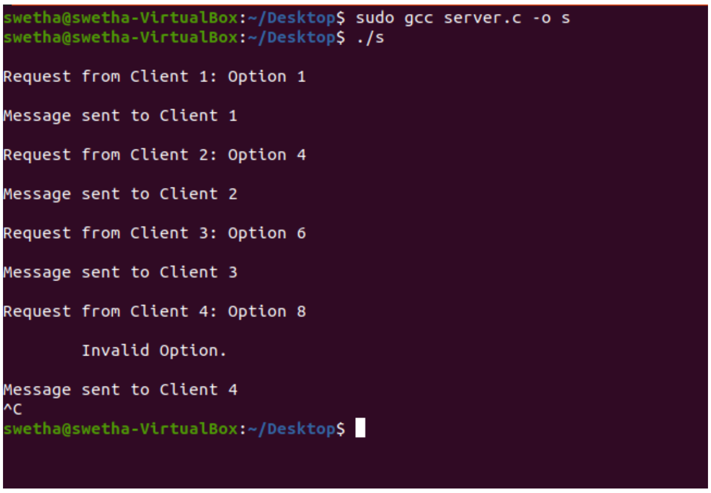
```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <string.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>

#define SA struct sockaddr
#define SERVER_PORT 8000
#define MAX 256

int error(char *msg){
    perror(msg);
    exit(1);
}
```



```
int main(int argc, char const *argv[])
{
    int sockfd,n;
    int con = 1;
    char opt;
    struct sockaddr_in servaddr;
    char buf[1024];

    //CREATE SOCKET
    if((sockfd = socket(AF_INET, SOCK_DGRAM, 0)) <= 0)
        error("\033[0;31mSOCKET ERROR\033[0m");

    //CLEAR servaddr
    bzero(&servaddr , sizeof(servaddr));

    // SET IP,PORT,FAMILY OF SERVER
    servaddr.sin_port = htons(SERVER_PORT);
    servaddr.sin_family = AF_INET;
    servaddr.sin_addr.s_addr = INADDR_ANY;

    //SEND REQUEST
   printf("\nRequest to Server:\n\t[1] Date\n\t[2] Day\n\t[3] Month\n\t[4]
 Year\n\t[5] Time\n\t[6] Toronto Time\nYour Option: ");
    scanf("%c", &opt);
    buf[0] = opt;
    sendto(sockfd, buf, sizeof(buf), 0, (SA*)&servaddr,sizeof(servaddr));
    bzero(buf,sizeof(MAX));

    //RECIEVE INFO
    printf("\nRequesting information from server\n\n");
    int addrlen = sizeof(servaddr);
    recvfrom(sockfd, buf, sizeof(buf), 0, (SA*)&servaddr,&addrlen);
    printf("\nRecieved from server: %s\n",buf);

    return 0;
}
```

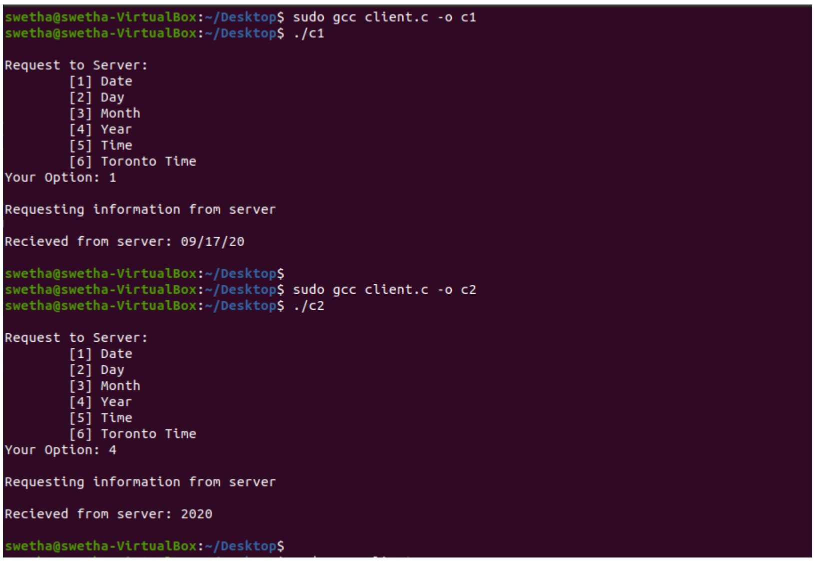
Sample Input Output:

SERVER SIDE:

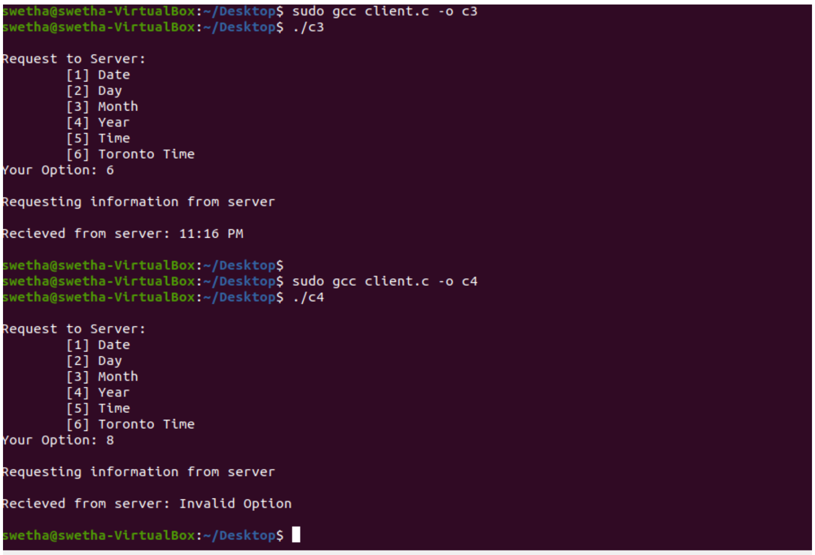


```
swetha@swetha-VirtualBox:~/Desktop$ sudo gcc server.c -o s
swetha@swetha-VirtualBox:~/Desktop$ ./s

Request from Client 1: Option 1

Message sent to Client 1

Request from Client 2: Option 4

Message sent to Client 2

Request from Client 3: Option 6

Message sent to Client 3

Request from Client 4: Option 8

        Invalid Option.

Message sent to Client 4
^C
swetha@swetha-VirtualBox:~/Desktop$ 
```

CLIENT SIDE:



```
swetha@swetha-VirtualBox:~/Desktop$ sudo gcc client.c -o c1
swetha@swetha-VirtualBox:~/Desktop$ ./c1

Request to Server:
        [1] Date
        [2] Day
        [3] Month
        [4] Year
        [5] Time
        [6] Toronto Time
Your Option: 1

Requesting information from server

Recieved from server: 09/17/20

swetha@swetha-VirtualBox:~/Desktop$
swetha@swetha-VirtualBox:~/Desktop$ sudo gcc client.c -o c2
swetha@swetha-VirtualBox:~/Desktop$ ./c2

Request to Server:
        [1] Date
        [2] Day
        [3] Month
        [4] Year
        [5] Time
        [6] Toronto Time
Your Option: 4

Requesting information from server

Recieved from server: 2020

swetha@swetha-VirtualBox:~/Desktop$
```



```
swetha@swetha-VirtualBox:~/Desktop$ sudo gcc client.c -o c3
swetha@swetha-VirtualBox:~/Desktop$ ./c3

Request to Server:
        [1] Date
        [2] Day
        [3] Month
        [4] Year
        [5] Time
        [6] Toronto Time
Your Option: 6

Requesting information from server

Recieved from server: 11:16 PM

swetha@swetha-VirtualBox:~/Desktop$
swetha@swetha-VirtualBox:~/Desktop$ sudo gcc client.c -o c4
swetha@swetha-VirtualBox:~/Desktop$ ./c4

Request to Server:
        [1] Date
        [2] Day
        [3] Month
        [4] Year
        [5] Time
        [6] Toronto Time
Your Option: 8

Requesting information from server

Recieved from server: Invalid Option

swetha@swetha-VirtualBox:~/Desktop$ 
```