MINOR ASSIGNMENT-12

Socket Programming: TCP & UDP (Networking Communication)

Practical Programming with C (CSE 3544)

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Course Outcome: CO ₆	Program Outcome: PO ₄	Learning Level: L ₅

Problem Statement:

Experiment with networking communication between client and server using socket API.

Assignment Objectives:

Students will be able learn how to establish communication between different programs (*i.e. processes*) over the network using TCP and UDP based socket programming.

Answer the followings:

l.	Write (statements	to cre	eate an	IPV4	socket	address	structure	and	ΠII	the	structure	with	family
	AF_IN	ET, port=3	4567 a	and IP a	ddress	s=127.0	.0.0.1.							

C Statements			

2. Write C statements to declare **two** Internet socket address structure, namely **servaddr** and **cliaddr** respectively. Read the port and IP address for the structures from the keyboard and display the port and IP address onto the monitor.

C Statements		

3. Determine the output of the following code snippet and write the opening file/socket descriptors that are opened for the process using the command \$ ls /proc/PID/fd in an another terminal.

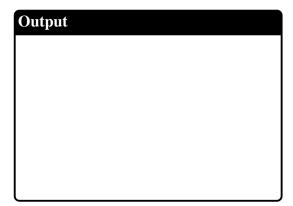
```
int main() {
  int sockfd,count=0,i;
  printf("PID=%ld\n",(long)getpid());
  for(i=0;i<=9;i++) {
    sockfd=socket(AF_INET,SOCK_STREAM,IPPROTO_TCP);
    count=count+1;
    printf("%d ",sockfd);
  }
  printf("\nsocket descriptor count=%d\n",count);
  while(1);
  return 0;
}</pre>
Output
```

4. Find out the output of the given code snippet and justify the reason of getting such output (**Hint: look into Host byte order and Network byte order**).

```
int main()
{
    struct sockaddr_in servaddr;
    servaddr.sin_family=AF_INET;
    servaddr.sin_port=htons(16);
    printf("Port given=%d\n", servaddr.sin_port);
    return 0;
}
```

5. Find out the output of the given code snippet.

```
int main()
{
  struct sockaddr_in servaddr;
  servaddr.sin_family=AF_INET;
  servaddr.sin_port=16;
  printf("Port=%d\n", servaddr.sin_port);
  return 0;
}
```



6. Fill out the missing parts of the following code snippet and Determine the output for the given port address as input: 16, 67, 879 respectively.

```
int main()
{
    ____ port;
    printf("Enter a port address:");
    scanf("%____", &port);
    struct sockaddr_in servaddr;
    servaddr.sin_family=AF_INET;
    servaddr.sin_port=htons(port);
    printf("Port=%d\n", htons(servaddr.sin_port));
    return 0;
}
```

Server Code here	

7. Develop a TCP based client-server programs to establish a communication between the client program

TCP Client Code here	Specify: input & output

	sending data to t Reading data tha		ent from the	server		
		it has occir so		SCIVCI		
DP Server	Code here					

8. Develop a UDP based client-server programs to establish a communication between the client pro-

UDP Client Code here	Specify: input & output