Batch:A2

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Experiment Number:4

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Title of the Experiment:TCP Header implementation

Program:

```
def TCPResult():
    tcp = input("Enter TCP header: ")
    test={'1','2','3','4','5','6','7','8','9','A','B','C','D','E',"F"}
    if len(tcp) != 40:
        print("Invalid Length")
        return

    for i in tcp:
        if i not in test:
            print("Invalid TCP")
            return




    print(f"Source Port- {tcp[:4]}")
    print(f"Destination Post Address- {tcp[4:8]}")
    print(f"Sequence Number- {tcp[8:16]}")
    print(f"Acknowledgement Number- {tcp[16:24]}")
    print(f"HLEN- {tcp[24]}")
```

```
    arr=tcp[25:28]
    res=""
    for i in arr:
        res+="{0:04b}".format(int(i,16))
    print(f"Reserved- {res[:6]}")
    print(f"Urgent- {res[6]}")
    print(f"Acknowledgment- {res[7]}")
    print(f"Push- {res[8]}")
    print(f"Reset- {res[9]}")
    print(f"Sync- {res[10]}")
    print(f"Finish- {res[11]}")

    print(f"Window Size- {tcp[28:32]}")
    print(f"CheckSum- {tcp[32:36]}")
    print(f"Urgent Pointer- {tcp[36:]}")



if __name__=='__main__':
    TCPResult()
```

Output:

```
PS D:\> & C:/Users/EXAM.16DITB213-12.000/AppData/Local/Program
Enter TCP header: A1234BCD6789BCDEF56781234ABCDEF123456789
Source Port- A123
Destination Post Address- 4BCD
Sequence Number- 6789BCDE
Acknowledgement Number- F5678123
HLEN- 4
Reserved- 101010
Urgent- 1
Acknowledgment- 1
Push- 1
Reset- 1
Sync- 0
Finish- 0
Window Size- DEF1
CheckSum- 2345
Urgent Pointer- 6789
PS D:\>
```

Post Lab Question- Answers (If Any):

1) The unit of data transfer between two devices using TCP is called **Packet or Frames.**
2) Which type of addressing is used at Transport Layer? **Port Addressing**

3) What is the difference between TCP and UDP?

Ans

TCP- Requires an established connection to transmit data. Can guarantee delivery of data to the destination router. Retransmission of lost packets is possible. Slower than UDP

UDP- Connectionless protocol with no requirements for opening, maintaining, or terminating a connection. Cannot guarantee delivery of data to the destination. No retransmission of lost packets. Faster than TCP

CO2: Enumerate the layers of the OSI model and the TCP/IP model, their functions and protocols

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Conclusion:

We understood about the different layers of the TCP model and also wrote a program to show values of each TCP header