Mobile Computing

(CSD - 427)

Lab Assignment - 3

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1 To Study the hidden and exposed terminal problems, write a program to demonstrate these problems.

1.1 Hidden Terminal Problem

In wireless LANs (wireless local area networks), the hidden terminal problem is a transmission problem that arises when two or more stations who are out of range of each other transmit simultaneously to a common recipient. This is prevalent in decentralised systems where there aren't any entity for controlling transmissions. This occurs when a station is visible from a wireless access point (AP), but is hidden from other stations that communicate with the AP.

1.2 Exposed Terminal Problem

In wireless LANs (wireless local area networks), the exposed terminal problem is a transmission problem that arises when a transmitting station is prevented from sending frames due to interference with another transmitting station. This is prevalent in decentralised systems where there aren't any entity for controlling transmissions. This occurs when a station is visible from a wireless access point (AP), but not from other stations that communicate with the AP.

1.3 Code

```
1  class Nodes:
2      def __init__(self, Name, Address):
3          self.range = 250
4          self.address = Address
5          self.id = Name
6          self.Neighbors = []
7          self.sending = False
8          self.recieving = False
9
10     def Recieve(self, sender):
11         if self.recieving == False:
12             print(f'{self.id} Recieving message from {
                   sender}')
13             self.recieving = True
14         else:
15             print('Unable to recieve message COLLISION'
                   )
16             print('HIDDEN TERMNAL PROBLEM \n')
17
18     def Transmit(self, receiver):
19         print(f'\n{self.id} sending message to {
               receiver.id}')
```

```
20          if receiver not in self.Neighbors:
21              print('Node out of range')
22          else:
23              for node in self.Neighbors:
24                  if node.sending == True:
25                      print('Unable to send message,
                            neighbor sending, waiting for
                            timeout')
26                      print('EXPOSED TERMINAL PROBLEM')
27                      self.sending = True
28                      break
29
30              if self.sending == False :
31                  self.sending = True
32                  receiver.Recieve(self.id)
33
34
35  def main():
36      A = Nodes('A', 450)
37      B = Nodes('B', 850)
38      C = Nodes('C', 650)
39      D = Nodes('D', 1050)
40
41      for i in [B , C, D]:
42          if abs(i.address - A.address) < A.range:
43              A.Neighbors.append(i)
44              i.Neighbors.append(A)
45
46      for i in [C, D]:
47          if abs(i.address - B.address) < B.range:
48              B.Neighbors.append(i)
49              i.Neighbors.append(B)
50
51      if abs(D.address - C.address) < C.range:
52          C.Neighbors.append(D)
53          D.Neighbors.append(C)
54
55      B.Transmit(C)
56      A.Transmit(D)
57      A.Transmit(C)
58      C.Transmit(A)
59
60  if __name__ == '__main__':
61      main()
```

```
Skandagpt@DESKTOP-IS2VMJQ MINGW64 /f/study/sem 8/Data Mining Lab
$ python "f:/study/sem 8/Mobile Computing lab/Lab3.py"

B sending message to C
C Recieving message from B

A sending message to D
Node out of range

A sending message to C
Unable to recieve message COLLISION
HIDDEN TERMNAL PROBLEM


C sending message to A
Unable to send message, neighbor sending, waiting for timeout
EXPOSED TERMINAL PROBLEM
```