

College Of Engineering Trivandrum

Object Oriented Programming using Python



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Question 1

Aim

To implement and simulate algorithm for link state routing protocol.

Theory

Link-State Routing Protocols are one of the two main classes of routing protocols used in packet switching networks for computer communications, the other being distance-vector routing protocols. Examples of link-state routing protocols include Open Shortest Path First (OSPF) and Intermediate System to Intermediate System (IS-IS).

The link-state protocol is performed by every switching node in the network (i.e., nodes that are prepared to forward packets; in the Internet, these are called routers). The basic concept of link-state routing is that every node constructs a map of the connectivity to the network, in the form of a graph, showing which nodes are connected to which other nodes. Each node then independently calculates the next best logical path from it to every possible destination in the network. Each collection of best paths will then form each node's routing table.

Algorithm

```
START
Step 1: Take integer variable A
Step 2: Divide the variable A with (A-1 to 2)
Step 3: If A is divisible by any value (A-1 to 2) it is not prime
Step 4: Else it is prime
STOP
```

code

```
#include <stdio.h>

int main() {
    int i, number;
    int prime = 1;
    printf("\nEnter a number: ");
    scanf("%d", &number);

    for(i = 2; i < number; i++) {
        if((number % i) == 0) {
```

```

        prime = 0;
    }
}
if (number == 1)
    printf("1 is neither prime nor composite \n\n");
else if (prime == 1)
    printf("%d is prime number.\n\n", number);
else
    printf("%d is not a prime number\n\n.", number);
return 0;
}

```

Output

```

rahul@Nitro:~/c$ ./matrix

Enter the number of rows and columns of matrix A
3 3

Enter the elements of the matrix A
2 4 5 8 7 1 1 2 3

Enter the number of rows and columns of matrix B
3 3

Enter the elements of the matrix B
1 2 3 4 5 6 7 8 9

Result of Addition
3 6 8
12 12 7
8 10 12

The product of the matrix A and B is:
53 64 75 43 59 75 30 36 42
The Transpose of the Matrix A
2 8 1
4 7 2
5 1 3

The upper triangular elements of the matrix B is:
1 2 3 5 6 9
The diagonal elements of the Matrix A is:

```

Result

Implemented the program for simulating Link State Routing Protocol in c and was compiled using gcc and executed in Ubuntu and the above output was obtained.

Question 2

Aim

To implement and simulate algorithm for link state routing protocol.

Theory

Link-State Routing Protocols are one of the two main classes of routing protocols used in packet switching networks for computer communications, the other being distance-vector routing protocols. Examples of link-state routing protocols include Open Shortest Path First (OSPF) and Intermediate System to Intermediate System (IS-IS).

The link-state protocol is performed by every switching node in the network (i.e., nodes that are prepared to forward packets; in the Internet, these are called routers). The basic concept of link-state routing is that every node constructs a map of the connectivity to the network, in the form of a graph, showing which nodes are connected to which other nodes. Each node then independently calculates the next best logical path from it to every possible destination in the network. Each collection of best paths will then form each node's routing table.

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            prime = 0;
        }
    }
    if (number == 1)
        printf("1 is neither prime nor composite \n\n");
    else if (prime == 1)
        printf("%d is prime number.\n\n", number);
    else
        printf("%d is not a prime number\n\n.", number);
    return 0;
}

```

Output

```

rahul@Nitro:~/c$ ./matrix

Enter the number of rows and columns of matrix A
3 3

Enter the elements of the matrix A
2 4 5 8 7 1 1 2 3

Enter the number of rows and columns of matrix B
3 3

Enter the elements of the matrix B
1 2 3 4 5 6 7 8 9

Result of Addition
3 6 8
12 12 7
8 10 12

The product of the matrix A and B is:
53 64 75 43 59 75 30 36 42
The Transpose of the Matrix A
2 8 1
4 7 2
5 1 3

The upper triangular elements of the matrix B is:
1 2 3 5 6 9
The diagonal elements of the Matrix A is:

```

Result

Implemented the program for simulating Link State Routing Protocol in c and was compiled using gcc and executed in Ubuntu and the above output was obtained.