Laboratory Work

Programs to implement set operations union, intersection, and difference

```
#define MAX 30
  #include<stdio.h>
  #include<conio.h>
  void create(int set[]);
  void Union(int set1[],int set2[],int set3[]);
  void intersection(int set1[],int set2[],int set3[]);
  void difference(int set1[],int set2[],int set3[]);
 int member(int set[],int x);
 void main()
          int set1[MAX],set2[MAX],set3[MAX];
          int x,op;
          set1[0]=set2[0]=set3[0]=0;
          printf("\nCreting First Set*****");
          create(set1);
          printf("\nCreating Second Set***
          create(set2);
 //calculate union
          Union(set1,set2,set3);
 //print set 3 using for loop
          n=set3[0];
          for(i=1,i<n;i++)
          print("%d\t", set3[i]);
//calculate intersections
n=set3[0];
for(i=1,i<n;i++)
         print("%d\t", set3[i]);
//calculate difference
         difference(set1,set2,set3);
         n=set3[0];
         for(i=1,i<n;i++)
         print("%d\t", set3[i]);
/*creates set[] with initial elements*/
        void create(int set[])
        int n,i,x;
```

```
set[0]=0;/*make it a null set*/
       printf("\n No. of elements in the set:");
       scanf("%d",&n);
       printf("\n enter set elements :");
                                              Life and Describe in Life and Life
       for(i=1;i<=n;i++)
       scanf("%d",&set[i]);
       set[0]=n; //Number of elements.
void print(int set[])
       int i,n;
                           n=set[0];/* number of elements in the set */
        printf("\Members of the set :-->");
                                                  Tree of become a City Land Him to a com-
        for(i=1;i<=n;i++)
        printf("%d ",set[i]);
/* union of set1[] and set2[] is stored in set3[]*/
                                               settili i muniper afrei otava in the sett
void Union(int set1[],int set2[],int set3[])
        int i,n;
                           tersonalists on insurement by maken in the addition of themselves
/* copy set1[] to set3[]*/
        set3[0]=0;/*make set3[] a null set */
        n=set1[0];/* number of elements in the set*/
                                            train for finding Contesion product of two sets (
//Union of set1,set2= set1 + (set2-set1)
        for(i=0;i<=n;i++)
        set3[i]=set1[i];
        n=set2[0];
        for(i=1;i<=n;i++)
        if(!member(set3,set2[i]))
        set3[++set3[0]]=set2[i]; // insert and increment no. of elements
/*function returns 1 or 0 depending on whether x belongs
 to set[] or not */
int member(int set[],int x)
        int i,n;
                                                              Separate antastrice
        n=set[0]; /* number of elements in the set*/
        for(i=1;i<=n;i++)
        if(x==set[i])
        return(1);
```

```
president at describe of President
             return(0);
    /*intersection of set1[] and set2[] is stored in set3[]*/
                                                                 nalythere is Number of elemen
    void intersection(int set1[],int set2[],int set3[])
            int i,n;
            set3[0]=0; /* make a NULL set*/
            n=set1[0];/* number of elements in the set*/
                                                                                    Hise in trine the
            for(i=1;i<=n;i++)
           if(member(set2,set1[i])) /* all common elements are inserted in set3[]*/
           set3[++set3[0]]=set1[i]; // insert and increment no. of elements
                                                                   omale heredanne "Tolly
                                                                               [-determ>|:] = () = () = () = ()
  /*difference of set1[] and set2[] is stored in set3[]*/
                                                                            Miller " La" While
  void difference(int set1[],int set2[],int set3[])
                                                        There is thrown in The hour the second
          int i,n;
          n=set1[0];/* number of elements in the set*/
                                                                (Nelse on 11Stanian (University biox
          set3[0]=0;/*make it a null set*/
          for(i=1;i<=n;i++)
          if(!member(set2,set1[i]))
          set3[++set3[0]]=set1[i]; // insert and increment no. of elements
                                                             to the help to the total \u00e46-fine less
                                                          tifely "member or elegrouss in if
C- Program for finding Cartesian product of two sets (
#include<stdio.h>
#include<conio.h>
void main()
        int a[10],b[10],c[10],i,j,k;
        clrscr();
        printf("enter d elements in set a:");
        for(i=0;i<5;i++)
                             meet and increment no, of elements
       scanf("%d",&a[i]);
       printf("\nenter d elements in set b:");
       for(j=0;j<5;j++)
      scanf("%d",&b[j]);
      printf("\ncartessian product=");
                                                   dina ant ni sinamai a la radama de ciebra.
      printf("{");
      for(i=0;i<5;i++)
     for(j=0;j<5;j++)
```

```
printf("(%d,%d)",a[i],b[j]);
       printf(",");
       printf(")");
       getch();
Programs to implement ceiling and floor functions manbelow a holor star between the transfer and
/* C program to demonstrate example of floor and ceil functions.*/
#include <stdio.h>
#include <math.h>
void main()
  float val;
  float fVal,cVal;
  printf("Enter a float value: ");
  scanf("%f",&val);
  fVal=floor(val);
  cVal =ceil(val);
  printf("floor value:%f\nceil value:%f\n",fVal,cVal);
  getch ();
Programs to implement Euclidean and Extended Euclidean algorithms
// C program to demonstrate Basic Euclidean Algorithm
#include <stdio.h>
// Function to return gcd of a and b
int gcd(int a, int b)
   if (a == 0)
     return b;
   return gcd(b%a, a);
 // Driver program to test above function
 void main()
         int a = 10, b = 15,c;
         c=gcd(a, b);
         printf("The GCD of %d and %d = %d\n", a, b,c);
```

```
a = 35, b = 10;
                                                                                                                                                                                                                 All deliberation to the control of t
                                c=gcd(a, b);
                               printf("The GCD of %d and %d = %d\n", a, b,c);
                                a = 31, b = 2;
                               c=gcd(a, b);
                               printf("The GCD of %d and %d = %d\n", a, b,c);
                               getch ();
    // C function to implemnet extended Euclidean Algorithm word bas guilles from the sense
     #include <stdio.h>
     int gcdExtended(int a, int b, int *x, int *y)
                              int x1,y1, gcd;
     // Base Case
                              if (a == 0)
                               x = 0
                              *y = 1;
                             return b;
                                                                                                                                                                                                                                " - WHEV INDEADING TO
                             x1, y1; // To store results of recursive call
                             gcd = gcdExtended(b%a, a, &x1, &y1);
 // Update x and y using results of recursive call
         x = y1 - (b/a) x1;
        *y = x1;
                                                                                                                                   con to implement birelt least and listended inglicaria
       return gcd;
                                                                                                                                             metion at a special state beautiful and a service
void main()
      int x, y;
                                                                                                                                                                                                                 d base is bug nation of cold
      int a = 35, b = 15;
      int g = gcdExtended(a, b, &x, &y);
     printf("gcd(%d, %d) = %d", a, b, g);
                                                                                                                                                                                                                                                                                              13 H
     return 0;
                                                                                                                                                                                                   professor to east along a function
                                                                                                                                                                                                  " he was by he Contact that
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```
programs to implement binary integer addition, multiplication, and division
// Program to implement Binary addition and Subtraction
#include <stdio.h>
int Addition(int a,int b)
             ens to implement Paclean matrix operations join, product and Boolean product
   int c; //carry
   while (b != 0) {
                                                      the appropriate for during some of the bord
       //find carry and shift it left
                                                      element of crairix should be either our
       c = (a & b) << 1;
       //find the sum
                                                                                 < Lobbish 5
       a=a^b;
       b=c;
                                                                        ini an m po o L L lo
   return a;
                                                        int first 5/15), second 5/16/1 (ore 5)
int Subtracton(int a, int b)
                                                          principally digital electroscopy of the contract
   int carry;
   //get 2's compliment of b and add in a
                                                                       for (i = 0; ) < gud+x)
   b = binAddition(~b, 1);
                                                                        रिकारिक हैती करातिका
                                                                   Milliant of Marine
   while (b != 0) {
        //find carry and shift it left
        carry = (a & b) << 1;
                                          trake la spriktis britalybi en mennen iddia bisch
                                                                 anti ded dep dep
        //find the sum
        a = a ^ b;
        b = carry;
                                                    neiff Enter elements of sejond matricial
                                                                            Freedom and Donald
   return a;
1
void main()
  int n1,n2, binAdd, binSub;
                                                                             (4+i yg >i () =
  printf("Input first integer value: ");
                                                                              1+41 U > 1 13 =
  scanf("%d",&n1);
  printf("Input second integer value: ");
  scanf("%d",&m2);
  binAdd=Addition(n1,n2);
  binSub=Subtracton(n1,n2);
  printf("Binary Addition: %d\n",binAdd);
```

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240 Discrete Structures
        printf("Binary Subtraction: %d\n",binSub); allow nothing regard quality in mid in mulquist sais
       getch ();
                                                                                                                     trong and the temperature and the state of t
                                                                                                                                                                                                                                   ver aithfic start
                                                                                                                                                                                                                         design into a cerb
Programs to implement Boolean matrix operations join, product, and Boolean product
//Write a program to find the join of two boolean matrix.
//The element of matrix shoud be either o or 1. Such matrix is known as Boolean Matrix.
#injlude <stdio.h>
void main()
                           int m, n, p, q, i, j, k;
                          int first[5][5], second[5][5], join[5][5];
                          printf("Enter number of rows and columns of first matrix\n");
                          sjanf("%d%d", &m, &n);
                          printf("Enter elements of first matrix\n");
                          for (i = 0; i < m; i++)
                                                                                                                                                                                                                   Fi definiti Tibitanda
                             for (j = 0; j < n; j++)
                                scanf("%d", &first[i][j]);
                         printf("Enter number of rows and columns of second matrix\n");
                         scanf("%d%d", &p, &q);
                       printf("Enter elements of sejond matrix\n");
                    for (i = 0; i < p; i++)
                    for (j = 0; j < q; j++)
                    scanf("%d", &sejond[i][j]);
                   for (i = 0; i < m; i++)
                   for (j = 0; j < q; j++)
                   printf("Boolean Join of the matrijes:\n");
                                                                                                                                                                                                                     Charles and the state
                for (i = 0; i < m; i++)
```

```
for (j = 0; j < q; j++)
        printf("%d\t", join[i][j]);
        printf("\n");
Output:
Enter number of rows and jolumns of first matrix: 2,2
Enter elements of first matrix:
1
0
0
Enter number of rows and jolumns of second matrix: 2,2
1
0
1
Boolean Join of the matrices:
         0
1
         0
1
//Write a program to find the meet of two boolean matrix.
//The element of matrix shoud be either o or 1. Such matrix is known as Boolean Matrix.
#injlude <stdio.h>
 void main()
         int m, n, p, q, i, j, k;
         int first[5][5], second[5][5], meet[5][5];
         printf("Enter number of rows and columns of first matrix\n");
         sjanf("%d%d", &m, &n);
         printf("Enter elements of first matrix\n");
         for (i = 0; i < m; i++)
          for (j = 0; j < n; j++)
         scanf("%d", &first[i][j]);
         printf("Enter number of rows and columns of second matrix\n");
         scanf("%d%d", &p, &q);
```

```
printf("Enter elements of second matrix\n");
            for (i = 0; i < p; i++)
                                                                      Sidilitary "The Manager
            for (j = 0; j < q; j++)
            scanf("%d", &sejond[i][j]);
            for (i = 0; i < m; i++)
            for (j = 0; j < q; j++)
                                                  has been and to emining hou
            meet[i][j] = first[i][j] && second[i][j];
           printf("Boolean Meet of the matrices:\n");
           for (i = 0; i < m; i++)
           for (j = 0; j < q; j++)
           printf("%d\t", meet[i][j]);
           printf("\n");
  }
                                             the program to (audithe most of two boolean matrix
              comment of multiple board belefither to or 1. Such marris is homeon as place on Marris.
 Output:
 Enter number of rows and jolumns of first matrix: 2,2
                                                                                     SH CUMBY S
 Enter elements of first matrix:
 1
 0
 0
 Enter number of rows and jolumns of second matrix: 2,2
1
0
1
0
Boolean meet of the matrices:
1
         0
0
         0
                              Cing shusin became to envision time seven la sec
```

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```
//Write a program to find the produjt of two boolean matrix.
//The element of matrix shoud be either o or 1. Such matrix is known as Boolean Matrix.
#injlude <stdio.h>
void main()
                             int m, n, p, q, i, j, k, sum = 0;
                              int first[5][5], sejond[5][5], multiply[5][5];
                              printf("Enter number of rows and columns of first matrix\n");
                              sjanf("%d%d", &m, &n);
                               printf("Enter elements of first matrix\n");
                               for (i = 0; i < m; i++)
                                for (j = 0; j < n; j++)
                                scanf("%d", &first[i][j]);
                                                                                                                                                                                        nameter of rown and priamin of second mar
                                printf("Enter number of rows and columns of second matrix\n");
                                 scanf("%d%d", &p, &q);
                                 if (n != p)
                                 printf("The matrijes can't be multiplied with each other.\n");
                                  else
                                  printf("Enter elements of second matrix\n");
                                   for (i = 0; i < p; i++)
                                                                                                                                                   is to test validity of anguments by using truth lables
                                                                                                                              a grayman in test time calledly of argument space; (q-se) we
                                    for (j = 0; j < q; j++)
                                   scanf("%d", &sejond[i][j]);
                                   for (i = 0; i < m; i++)
                                    for (j = 0; j < q; j++)
                                    for (k = 0; k < p; k++)
                                    sum = sum | | first[i][k] && second[k][j];
                                    multiply[i][j] = sum;
                                                                                                                                                                                            NADJeconsect) (Ocas) = Millimitati
                                    sum = 0;
                                                                                         mole, i [ii. = muthtable[2][0]=muthtable[3][0]=iruthable[4][0]="1";
                                                                                            The [0] Sinkinder [0] The [0] or or with the contract of the c
                                    printf("Boolean Product of the matrijes:\n");
                                                                                                               the still entitle of the state 
                                     for (i = 0; i < m; i++) [7] stdathfurt*[2][2] stdathfurt*[2][3] stdathfurt*[2][7]
                                                                                               sic[2][2]=isutitable[4][2]=isutitable[6][2]=isutihable[8][2]=iso
```

```
Discrete Structures
             for (j = 0; j < q; j++)
             printf("%d\t", multiply[i][j]);
             printf("\n");
                                                                 the main i
                                                     Individualism in the Landon for the tail tail
    Output:
   Enter number of rows and columns of first matrix: 2,2
   Enter elements of first matrix:
   1
   0
   1
  0
  Enter number of rows and jolumns of second matrix: 2,2
  1
  1
  1
  1
 Boolean Product of the matrices:
 1
          1
 1
         1
Programs to test validity of arguments by using truth tables
//Write a program to test the validity of argument (p->q)^(q->r)==(q^r)?
#include <stdio.h>
void main()
       char truthtable[9][8];
       truthtable[0][0]="P";
       truthtable[0][1]="Q";
       truthtable[0][2]="R";
       truthtable[0][3]="P=>Q";
       truthtable[0][4]="Q=>R";
      truthtable[0][5]="(P=>Q)^(Q=>R)";
      truthtable[0][6]="Q^R";
      truthtable[0][0]="(P=>Q)^(Q=>R)<=>(Q^R)";
     truthtable[1][0]=truthtable[2][0]=truthtable[3][0]=truthtable[4][0]="T";
     truthtable[5][0]=truthtable[6][0]=truthtable[7][0]=truthtable[8][0]="F";
     truthtable[1][1]=truthtable[2][1]=truthtable[5][1]=truthtable[6][0]="T";
     truthtable[3][1]=truthtable[4][1]=truthtable[7][1]=truthtable[8][1]="F";
    truthtable[1][2]=truthtable[3][2]=truthtable[5][2]=truthtable[7][2]="T";
    truthtable[2][2]=truthtable[4][2]=truthtable[6][2]=truthtable[8][2]="F";
```

```
int i.j;
for(i=1;i<9;i++)
if(truthtable[i][0]=="T" && truthtable[i][1]=="F")
truthtable[i][3]="F";
truthtable[i][3]="T";
for(i=1;i<9;i++)
if(truthtable[i][1]=="T" && truthtable[i][2]=="F")
truthtable[i][4]="F";
else
truthtable[i][4]="T";
 for(i=1;i<9;i++)
 if(truthtable[i][3]=="T" && truthtable[i][4]=="T")
 truthtable[i][5]="T";
 else
 truthtable[i][5]="F";
 for(i=1;i<9;i++)
 if(truthtable[i][1]=="T" && truthtable[i][2]=="T")
 truthtable[i][6]="T";
 else
  truthtable[i][6]="F";
  for(i=1;i<9;i++)
  if(truthtable[i][5]=="T" && truthtable[i][6]=="T")
  truthtable[i][7]="T";
  if(truthtable[i][5]=="F" && truthtable[i][6]=="F")
  truthtable[i][7]="T";
  else
  truthtable[i][7]="F";
  for(i=1;i<9;i++)
  for(j=0;i<8;i++)
  if(i!=0 && j==5)
  printf("\t");
```

```
printf("%d\t", truthtable[i][j]);
                                                                       f4-15-92 / 1499 / 1
          printf("\n");
                                          CT no Hillanda intern Ant Two Williams date of the
         for(i=1;i<9;i++)
         if(truthtable[i][7]=="T")
         continue;
         else
         break;
                                                                        if(i==9)
         printf("This is Valid Argument.");
         printf("This is Invalid Argument.");
Programs to compute an, bn mod m, linear search etc by using recursion
                                                                     The Rilling from the
#include <stdio.h>
int power(int b, int n);
void main()
                                                  i delicinitare cinà
       int b, n, result;
       printf("Enter base number: ");
       scanf("%d",&b);
       printf("Enter power number(positive integer): ");
       scanf("%d",&n);
      result = power(b, n);
      printf("%d^%d = %d", b, n, result);
      int power(int b, int n)
      if (n == 0)
      return 1;
     else
     return (b*power(b, n-1));
```

```
to every linear search algorithm witte remains
Enter base number: 3
Enter power number(positive integer): 4
// Write a Program to calculate power(b, n)modulo m
int power(int b, unsigned int n, int m)
        int res = 1; // Initialize result
        b = b \% m; // Update b if it is more than or
        // equal to m
        while (n > 0)
        // If n is odd, multiply b with result
         if (n & 1)
        res = (res*b) % m;
         // n must be even now
                                                                 . Million, but there
         n = n >> 1; // y = y/2
         b = (b*b) % m;
         return res;
void main()
                                                      neval "Id is not present", keeps
         int b,n,m,result;
         //Enter the value of b,n,m
         printf("\n Enter the positive integer b:");
         scanf("%d", &b);
         printf("\n Enter the positive integer n:");
         scanf("%d", &n);
         printf("\n Enter the positive integer m:");
         scanf("%d", &m);
         //calculate the result
         result=power(b,n,m);
         printf("Modulo Power is %d", result);
 Output:
Enter the positive integer b: 2
Enter the positive integer n: 3
Enter the positive integer m: 5
Modulo Power is: 3
```



Program to implement linear search algorithm using recursion.

```
#include<stdio.h>
    int LinSearch(int a[], int l, int r, int key)
            if (r < 1)
            return -1;
            if (a[l] == key)
            return l;
            return LinSearch(a, 1+1, r, key);
            void main()
            int n;
            int a[6],i;
            int key;
            printf("Enter the size of list: ");
            scanf("%d", &n);
           printf("\nEnter the elements of list:");
            for(i=0;i<n;i++)
                     scanf("%d",&a[i]);
           printf("Enter the key to be searched:");
           scanf("%d", &key);
           int index = LinSearch(a, 0, n-1, key);
           if (index != -1)
           printf("Element %d is present at index %d", key, index);
           printf("Element %d is not present", key);
          return 0;
 }
 Output:
 Enter the size of list: 6
Enter the element of list: 12,3,4,6,7,9
Enter the key to be searched: 6
Element 6 is present at index 3
Programs to generate permutations
```

```
#include<stdio.h>
#include<conio.h>
        void main ()
       int n, r, i;
       long f1=1, f2=1; p;
       cirscrc
      printf("Enter the value of n and r:");
      scanf ("%d %d", &n, &r);
```

```
f1 = f1*i;
        for (i = 1, i < =(n-r); i++)
        f2 = f2 * i;
        P = f1/f2;
        Printf("\n the permutaion P(%d, %d) = %d", n, r, P);
         getch();
1
Program to generate combination
#include<stdio.h>
#include<conio.h>
         void main ()
         int n, r, i;
         long f1 = 1, f2 = 1, f3 = 1, c;
         cirscr();
         printf("Enter value of n and r:");
         scanf ("% d %d", &rn, &r);
         for (i = 1; i < = n; i ++)
         f1 = f1*i;
         for (i = 1; i< = (n - r); i ++)
         f2 = f2 * i;
         for (i = 1; i < = r; i ++)
         f3 = f3 * i;
         c = f1/(f2 * f3);
        prinf ("\n The Combination c(%d, %d) = %d", n, r, c),
        getch();
```



Programs to represent graphs, finding shortest path, and generating minimum spanning trees

```
C- Program to represent the graph using adjacency matrix.
       include < stdio.h >
       # include < conio.h >
       void main()
       int option;
       clrscr();
       do
                      printf("\n A Program to represent a Graph by using an ");
                      printf("Adjacency Matrix method \n ");
                     printf("\n 1. Directed Graph ");
                     printf("\n 2. Un-Directed Graph ");
                     printf("\n 3. Exit ");
                     printf("\n\n Select a proper option : ");
                     scanf("%d", &option);
                    switch(option)
                            case 1 : dir_graph();
                                      break;
                            case 2 : undir_graph();
                                     break;
                            case 3 : exit(0);
                  1// switch
         |while(1);
}// main
int dir_graph()
        int adj_mat[50][50];
        int n;
       int in_deg, out_deg, i, j;
       printf("\n How Many Vertices ?: ");
       scanf("%d", &n);
       read_graph (adj_mat, n);
      printf("\n Vertex \t In_Degree \t Out_Degree \t Total_Degree ");
      for (i = 1; i < = n; i++)
     in_{deg} = out_{deg} = 0;
     for (j = 1; j \le n; j++)
             if (adj_mat[j][i] == 1)
             in_deg++;
   ] // for
  for (j = 1; j \le n; j++)
           if (adj_mat[i][j] == 1)
```

```
out_deg++;
                                                   printf("\n\n
 %5d\t\t\t%d\t\t%d\t\t%d\n\n",i,in_deg.out_deg,in_deg+out_deg);
                        1//for
                        return;
]// dir_graph
int undir_graph()
                        int adj_mat[50][50];
 1
                         int deg, i, j, n;
                         printf("\n How Many Vertices ?: ");
                         scanf("%d", &n);
                         read_graph(adj_mat, n);
                          printf("\n Vertex \t Degree ");
                          for (i = 1; i <= n; i++)
                          deg = 0;
                          for (j = 1; j <= n; j++)
                          if ( adj_mat[i][j] == 1)
                           printf("\n\n %5d \t\t %d\n\n", i, deg);
                           }// for
                          return;
 /// undir_graph
 int read_graph (int adj_mat[50][50], int n)
                           int i, j;
                           char reply;
                           for (i = 1; i <= n; i++)
                           for (j = 1; j \le n; j++)
                                                        if(i==j)
                                                         adj_mat[i][j] = 0;
                                                         continue;
                                                         }// if
                                                         printf("\n Vertices %d & %d are Adjacent ? (Y/N) :",i,j);
                                                         fflush(stdin);
                                                         scanf("%c", &reply);
                                                         if (reply == 'y' | | reply == 'Y')
                                                          adj_mat[i][j] = 1;
                                                          else
                                                         adj_mat[i][j] = 0;
                            }// for
                                                                                                                                                                                      the state of the s
                            }// for
                            return;
```



```
1// read_graph
C- Program to Implement Kruskal's Algorithm to find Minimum spanning tree.
#include<stdio.h>
#include<conto.h>
#include<stdllb.h>
int i,j,k,a,b,u,v,n,ne=1;
int min,mincost=0,cost[9][9],parent[9];
int find(int);
int uni(int,int);
void main()
        printf("\n\tImplementation of Kruskat's algorithm\n");
        printf("\nEnter the no. of vertices:");
        scanf("%d",&n);
        printf("\nEnter the cost adjacency matrix(\n"))
        for(i=1;i<=n;i++)
        for(j=1;j<=n;j++)
       scanf("%d",&cost[i][j]);
       if(cost[i][j]==0)
       cost[i][j]=999;
       printf("The edges of Minimum Cost Spanning Tree are\n");
       while(ne < n)
       for(i=1,min=999;i<=n;i++)
       for(j=1;j \le n;j++)
       if(cost[i][j] < min)
      min=cost[i][j];
      a=u=i;
      b=v=i;
      u=find(u);
      v=find(v);
      if(uni(u,v))
     printf("%d edge (%d,%d) = %d\n",ne++,a,b,min);
     mincost +=min;
```

```
Laboratory Work
      cost[a][b]=cost[b][a]=999;
      printf("\n\tMinimum cost = %d\n",mincost);
      getch();
      int find(int i)
      while(parent[i])
      i=parent[i];
      return i;
      int uni(int i,int j)
       If(i!=j)
       parent[j]=i;
       return 1;
       return 0;
C-program to implementing Dijkstra's Algorithm for finding shortest path in weighted graph.
#include<stdio.h>
#include<conio.h>
void dij(int n,int v,int cost[10][10],int dist[]);
void main()
        int n,v,i,j,cost[10][10],dist[10];
        clrscr();
        printf("*** Dijkstra Algorithm ***\n");
        printf("Enter the total number of Nodes.\t");
        scanf("%d",&cn);
        printf("Enter the cost matrix.\n");
        for(i=1;i<=n;i++)
        for(j=1;j<=n;j++)
                  scanf("%d",&cost[i][j]);
                  if(cost[i][j]==0)
                  cost[i][j]=999;
        printf("Enter the source Vertex.\t");
        scanf("%d",&v);
        dij(n,v,cost,dist);
        printf("\nShortest path:\n");
```

for(i=1;i<=n;i++)

printf("V%d->V%d,cost=%d\n",v,i,dist[i]);

if(i!=v)

getch();

```
for(w=1;w<=n;w++)

if(dist[w]<min && !flag[w])

min=dist[w],u=w;

flag[u]=1;

count++;

for(w=1;w<=n;w++)

if((dist[u]+cost[u][w]<dist[w]) && !flag[w])

dist[w]=dist[u]+cost[u][w];

}

void main()
{

int n,v,i,j,cost[10][10],dist[10];

clrscr();

printf("n Enter the number of nodes:");
```

Light technicies "ten

```
scanf("%d",&m);
printf("n Enter the cost matrix:n");
for(i=1;i<=n;i++)
 for(j=1;j<=n;j++)
                                                                                                                   & maintel?
                                                                                                                                                                                                  Long Assessed Decembers
  scanf("%d",&cost[i][j]);
                                                                                                                                                                                                 Allemot any 2 questions.
  if(cost[i][j]==0)
   cost[i][j]=infinity;
                                                 err land to employ their to not need report to anything and anything will be
printf("n Enter the source matrix:");
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scanf("%d",&ev);
                                                                                                                                     Define based Milwaysoviers and a con-
dij(n,v,cost,dist);
printf("n Shortest path:n");
                                                                                                                      karra tanilgiga serigidayan garan Terminin
for(i=1;i<=n;i++)
                                                                                                                        HOW BURNESS CONTROL WITH A STREET WAS COUNTY
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  printf("%d->%d,cost=%dn",v,i,dist[i]);
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getch();
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