**TechnoIndiaNJRInstituteofTechnology**



**LabManual**

**ComputerProgrammingLab(1FY3-24/2FY3-24)**

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**CourseOverview:**

### This courseon problem solving with Cprogramming covers, C Programming language essentials suchas programming techniques, decision making statements, iterations, functions, macros, 1D array, 2Darrays,pointers,dynamicmemoryallocationforarraysaswellasstructures,andfilehandling.

Tomasteranyprogramminglanguageoneneedshands-onpracticealongwithclarityofconcepts.Thecourseemphasis50%ofcoursedurationonLabpracticeand,GroupExercise,ClassroomQuiztohelp increasestudentscuriosity.

ProgrammingconceptsarethebasicrequirementforComputerSciencegraduatesinordertoget good jobs in IT companies. Most of the questions asked during the placement drive for the ITCompany are created from C programming. Student should learn and develop problem solving abilitiesusingCprogrammingforagoodcareer.

# CourseOutcome:

|  |  |  |
| --- | --- | --- |
| **CONO** | **CognitiveLevel** | **CourseOutcome** |
| **CO1** | Application | Studentswillbeabletowrite,compileanddebugprogramsinClanguage,usingthe32/64bitcompiler. |
| **CO2** | Application | Studentshouldbeabletowriteprogramusingloopingstatement. |
| **CO3** | Application | Studentshouldbeabletoperform2Dmatrixmultiplication,addition,subtractionandtransformationusingCprogramminglanguage. |
| **CO4** | Application | StudentshouldbeabletowriteCprogramsusingstructures,andarrayofstructures. |
| **CO5** | Application | Student should be able to write c programs using Pointer File handling & Command line Argument. |

## MappingCOs,POsandPSOs:

|  |
| --- |
| **ComputerProgrammingLab(1FY3-24/2FY3-24)** |
| **CourseOutcome** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | **2** | **1** | **2** | **-** | **2** | **-** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO2** | **2** | **1** | **2** | **-** | **2** | **-** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO3** | **2** | **1** | **2** | **-** | **2** | **-** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO4** | **2** | **1** | **2** | **-** | **2** | **-** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO5** | **2** | **1** | **2** | **-** | **2** | **-** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **1:Slight(Low),2:Moderate(Medium),3:Substantial(high)** |

**MappingJustification:**

|  |  |  |
| --- | --- | --- |
| **CO** | **PO** | **Justification** |
| CO1CO2CO3CO4CO5 | PO1 | TowriteaCprogramstudentmustrequiretheknowledgeofmathematics,that’swhyCO1ismoderatelymappedwithPO1. |
| PO2 | WhenastudentwriteordesignaCprogramitrequiresananalysisofproblemstatementbutitdoesnotrequirescomplexanalysissoCO1ismappedwithPO2withlow level. |
| PO3 | Studentsarerequiredtodesignflowchartsandalgorithm,alsotowriteCprogramsbasedonthealgorithmthat’swhyCO1ismoderatelymappedwithPO3. |
| PO5 | WritingCprogramrequiretheuseof32/64bitcompilerssuchascodeblocksandVScode,that’swhyCO1ismoderatelymappedwithPO1. |
| PO8 | Studentsaremotivatedtoapplyethicalpracticeswhilesubmittingthecodefortheproblemstatement.Theyareencouragednottocopythecodeofothers.That’swhyCO1ismappedwithPO8withlowlevel. |

**LISTOFLABEXERCISES:**

|  |  |
| --- | --- |
| **SNo** | **Nameoftheprogram** |
| 1 | 1. Toevaluatealgebraicexp(ax+b)/(ax-b)
2. toEvaluatealgebraicexp2.5logx+cos32+|x\*x-y\*y|+sqrt(2\*x\*y)
3. toevaluatethealgebraicexpaepower-rt
4. toevaluatealgebraicexpxpower5+10xpower4+8xpower3+4x+2
 |
| 2 | Toevaluateareaoftriangle(sqrt(s(s-a)(s-b)(s-c) |
| 3 | Toswap2no |
| 4 | Greatestof2no |
| 5 | Greatestof3numbers |
| 5 | Greatestof3ontoprintthegivennoinascendingorder |
| 6 | Toperformthearithmeticexpressionusingswitchstatement |
| 7 | Factorialofgivennousingdowhilestatement |
| 8 | Toprintprimeuptonno |
| 9 | Sumofnnaturalno |
| 10 | Totalno.ofevenintegers |
| 11 | Totalno.ofoddintegers |
| 12 | Sumofevenintegers |
| 13 | Sumofoddintegers |
| 14 | Aprogramtoprinttheproductoftwomatricesofanyorder |
| 15 | WriteaprogramtoprintFibonacciseries |
| 16 | Writeaprogramtoprinto/psa)1 b)1 c)1 d)122 22 22 23333 3 3 3 333 456 |
| 17 | Writeaprogramtoreadnnumofstudentsand5submarks |
| 18 | Writeaprogramtofindfactorialofanumusing3typesoffuns |
| 19 | Writeaprogramtoconvertalllowercasetouppercasecharacters. |
| 20 | Writeaprogramtoextractastring |
| 21 | Writeaprogramtosort5citynamesinalphabeticalorder |
| 22 | Writeaprogramtofindthefactorialofanumberusingrecursion |
| 23 | Aprogramtoprintaddressofvariable |
| 24 | Aprogramtoaccessavariableusingpointers |
| 25 | Aprogramtoprinttheelementofarrayusingpointers |
| 26 | Aprogramtoimplementcallbyreference |
| 27 | Aprogramtofindgreatestof‘n’numusingfuns |
| 28 | Aprogramtoprinttheelementsofastructureusingpointers |
| 29 | Aprogramtodisplaystudentinformationbyinitializingstructures |
| 30 | Aprogramtofindtotalnumberofmarks |
| 31 | Assignment1 |
| 32 | Assignment2 |

## Experiment1:

1. **Toevaluatealgebraicexp(ax+b)/(ax-b)**
2. **toEvaluatealgebraicexp2.5logx+cos32+|x\*x-y\*y|+sqrt(2\*x\*y)**
3. **toevaluatethealgebraicexpaepower-rt**
4. **toevaluatealgebraicexpxpower5+10xpower4+8xpower3+4x+2**

## (a)

1. **AIM:Toevaluatealgebraicexp(ax+b)/(ax-b)**

## ALGORITHM:

Step1:start

Step2:inputa,b,x,sStep3:s=(a\*x+b)/(a\*x-b)Step4:Results

Step5:stop

start

takea,b,x

a=5,b=4,x=3

## FLOWCHART:

**Toevaluatealgebraicexp(ax+b)/(ax-b)**

R=(ax+b)/(ax-b)

stop

display

## PROGRAM:

**Toevaluatealgebraicexp(ax+b)/(ax-b)**

main()

{

int a,b,x;float s;clrscr();

printf("enterthevaluesofa,b,x...");scanf("%d%d%d",&a,&b,&x);

s=(a\*x+b)/(a\*x-b); printf("thevalueofs=%f",s);

}

## Result:

**Enterthevaluesofa,b,x…132Thevalueofs=5**

## c)

1. **AIM:Toevaluatealgebraicexpxpower5+10xpower4+8xpower3+4x+2**

## ALGORITHM:

Step1: startStep2:inputx,s

Step3:s=pow(x,s)+10\*pow(x,4)+8\*pow(x,3)+4\*x+2Step4:Result s

Step5:stop\*/

## FLOWCHART:

start

**Toevaluatealgebraicexpxpower5+10xpower4+8xpower3+4x+2**

takex

x=6

R==pow(x,s)+10\*pow(x,4)+8\*pow(x,3)+4\*x+2

stop

DisplayR

## PROGRAM:

**Toevaluatealgebraicexpxpower5+10xpower4+8xpower3+4x+2**

#include<stdio.h>#include<math.h>main()

{

floatx,s;

printf("enter the values of x");scanf("%f",&x);s=pow(x,5)+10\*pow(x,4)+8\*pow(x,3)+4\*x+2;printf("thevalueofs=%f",s);

}

# Result:

Enterthevaluesofx1Thevalueofs=25

## d)

R=a\*pow(e,-kt)

1. **AIM:Toevaluatethealgebraicexpaepower-rt**

## ALGORITHM:

step1:takea,kandt

step2:assignvaluesforthem

step3:herea\*pow(e,-k\*t)storethisin'r'Display'r'

step4:stop\*/

## FLOWCHART:

start

takea,k,t

a=1,k=1,t=1

**Toevaluatethealgebraicexpaepower-rt**

stop

displayR

# PROGRAM:

**Toevaluatethealgebraicexpaepower-rt**

#include<stdio.h>#include<math.h>main()

{

int a,k,t;floatr;

printf("enterthree values");scanf("%d%d%d",&a,&k,&t);r=a\*pow(e,-k\*t);printf("result=%f");

getch();

}

# Result:

Enter values1

2

3

Result=1.000000

# Questions:

1. WhatisanExpression?
2. Whatistheuseofmain()function?
3. WhatarepreprocessorsofC?
4. Whatisavariable?

## Experiment2:

* 1. **AIM:Toevaluateareaoftriangle(sqrt(s(s-a)(s-b)(s-c)**

## ALGORITHM:

Step1:startStep2:input a,r,t,sStep3:s=a\*pow(-r\*t)Step4:Results

Step5:stop\*/

## FLOWCHART:

Start

takea,b,c,s,a

a=5,b=4,c=2

**Toevaluateareaoftriangle(sqrt(s(s-a)(s-b)(s-c)**

s=(a+b+c)/2

A=sqrt(s-a)(s-b)(s-c)

Stop

DisplayR

## PROGRAM:

**Toevaluateareaoftriangle(sqrt(s(s-a)(s-b)(s-c)**

#include<math.h>voidmain()

{

int a,b,c;float s,area;clrscr();

printf("enterthevaluesofa,b,c");scanf("%d%d%d",&a,&b,&c);s=(a+b+c)/2;

area=sqrt(s\*(s-a)\*(s-b)\*(s-c));

printf("theareaofatrangleis=%f",area);getch();

}

## Result:

enterthevaluesofa,b,c10

20

30

Theareaofatrangleis=0.000000

## Questions:

1. Whatistheuseofsqrt()function?
2. Explaindatatypes.
3. ExplainI/OStatements.

# Experiment 3:

* 1. **AIM:Programtoswaptwonumbers**
	2. **ALGORITHM:**

Step1:startStep2:input a,bStep3:a=a+bStep4:b=a-bStep 5:a=a-bStep6:Result a,bStep7:stop

## FLOWCHART:

**Programtoswaptwonumbers**

start

takea,b

a=1,b=10

stop

a=a+b;b=a-b;a=a-b

## PROGRAM:

**Programtoswaptwonumbers**

voidmain()

{

int a,b;clrscr();

printf("enterthevaluesofa,b");scanf("%d%d",&a,&b);

a=a+b;b=a-b;

a=a-b;

printf("thevaluesofa,bare:%d%d",a,b);getch();

}

# Result:

Enterthevaluesofa,b10

2

Thevaluesofa,bare:2010

## Questions:

1. Whatistheuseofgetch()function?
2. Whatistheuseofspecificationsofthedatatypes?

# Experiment 4:

1. **AIM:Programtofindgreatestof2numbersusingconditionaloperator**
2. **ALGORITHM:**

Step1:startStep2:input a,b,cStep3:c=(a>b)?a:bStep4:Result cStep5:stop\*/

## FLOWCHART:

**ToFindGreatestofTwonumbers.**

Start

Takea,b

C=(a>b)?a:b

Stop

Displayc

## PROGRAM:

**Prog:Tofindgreatestof2numbers**

voidmain()

{

inta,b,c;

clrscr();

printf("enterthevaluesofa,b");scanf("%d%d",&a,&b);

c=(a>b)?a:b;

printf("thebiggestnois%d",c);getch();

}

## Result

Enterthevaluesofa,b5

8

Thebiggestnumberis:8

## Questions:

* 1. Whatisanoperators?
	2. HowmanyoperatorsarethereinCandListoutthem?
	3. Whatisthedifferencebetweenlogicalandconditionaloperators?

## Experiment5:

1. **AIM:Programtofindgreatestamong3numbers**

## ALGORITHM:

Step1:startStep2:inputa,b,c

Step3:if(a>b) &&(a>c)Step4:displayaisgraterStep 5:elseStep6:if(b>c)

Step7:displaybisgraterStep8:else

Step:displaycisgraterStep10:stop

1. **FLOWCHART:**

Start

Takea,b,c

If

(a>b)&&(a>c)

If(b>c)

Stop

Displayb

Displayc

Displaya

**Tofindgreatestamong3numbers**

## PROGRAM:

**Programtofindgreatestamong3numbers**

voidmain()

{

inta,b,c;

clrscr();

printf("enterthevaluesofa,bandc");scanf("%d%d%d",&a,&b,&c);

if(a>b&&a>c)

printf("aisgreatestof%d%d%d",a,b,c);else

if(b>c)

printf("bisgreatestof%d%d%d",a,b,c);else

printf("cisgratestof%d%d%d",a,b,c);getch();

}

## Result:

Enterthevaluesofa,bandc10

30

20

30isgreatestof103020

## Questions:

1. Whataretheconditionalstatements?
2. HowmanyconditionalstatementsarethereinC?
3. Whatisthedifferencebetweenconditionalandmulti-conditionalstatements?

## Experiment5:

* 1. **AIM:ProgramtofindGreatestof3numberstoprintthegivennoinascendingorder.**

## ALGORITHM:

Step1:startStep2:inputa,b,c

Step3:if(a>b) &&(a>c)Step4:if(b>c)Step5:display a,b,cStep6:elseStep7:displaya,c,b

Step8:elseif(b<c&&b<a)Step9:if(c<a)

Step10:print b,c,aStep11:elseStep12:printb,a,c

Step13:elseif(c<a&&c<b)Step14:if(a<b)

Step15:print c,a,bStep16:elseStep17:print c,b,aStep18:stop\*/

## FLOWCHART:

**ToFindgreatestofThreenotoprintthegivennoinascendingorder**

Start

Takea,b,c

If

(a>b&&a>c)

If(b>c)

If

(b<c&&(b<a)

If (c<a)

If

C<a&&c<b)

If (a<b)

Stop

Displayc,b,a

Displayb,a,c

Displayb,c,a

Displaya,b,c

Displaya,c,b

Displayc,a,b

## PROGRAM:

**ProgramtofindGratestof3numberstoprintthegivennoinascendingorder**

voidmain()

{

inta,b,c;

clrscr();

printf("enterthevaluesofa,bandc");scanf("%d%d%d",&a,&b,&c);

if(a<b&&a<c)

{

if(b<c)

{

printf("%d%d%d",a,b,c);

}

elseif(b>c)

printf("%d%d%d",a,c,b);

}

else

if(b<c&&b<a)

{

if(c<a)

printf(" %d%d%d",b,c,a);elseprintf("%d%d%d",b,a,c);

}

elseif(b<a)

printf("%d%d%d",c,b,a);

elseprintf(%d%d%d",c,a,b);

}

}

# Result:

Enterthevaluesofa,bandc6

4

5

456

## Experiment6:

1. **AIM:Programtoperformthearithmeticexpressionusingswitchstatement**

## ALGORITHM:

Step1:startStep2:input a,bStep3:switch(result)

Step4:case ‘+’:printnum of a& b is a+bStep5: case ‘-’:printnum of a& b is a-bStep6: case ‘\*’:printnum of a& b is a\*bStep7: case ‘/’:printnum of a& b is a/bStep8:case‘%’:printnumofa&bisa%bStep9:default:invalidoption

Step10:stop

## PROGRAM:

**Programtoperformthearithmeticexpressionusingswitchstatement**

#include<stdio.h>#include<conio.h>voidmain()

{

int a,b;int op;clrscr();

printf("1.addition\n2.subtraction\n3.multiplication\n4.division\n");printf("enterthevaluesofa&b");

scanf("%d%d",&a,&b);printf("enteryourchoice:");scanf("%d",&op);switch(op)

{

case1 :printf("sumof%dand%d=%d",a,b,a+b);break;

case2 :printf("differenceof%dand%d=%d",a,b,a-b);break;

case3 :printf("multiplicationof%dand%d=%d",a,b,a\*b);break;

case4 :printf("Divisionnoftwonumbersis%d=",a/b);break;

default :printf("EnterYourCorrectChoice.");break;

}

getch();

}

## 5)Result:

1. Addition
2. Substraction
3. Multiplication
4. Division

Enter your choice : 1Enteraandbvalues1020Sumof10and20=30

# Experiment 7:

1. **AIM:Programtofindthefactorialofagivennumber**
2. **ALGORITHM:**

Step1: startStep2:inputn,I,fStep3: f=i=1Step4: if(i<=n)Step5: f=f\*iStep6:i=i+1

Step7:repeatfromstep5tostep6tillstepstrueStep8:printf

Start

Taken

F=i=1

Step9:stop

## FLOWCHART:

**Programtofindthefactorialofagivennumber**

If

f=f\*i;i=i+1

Stop

Displayf

## PROGRAM:

**Programtofindthefactorialofagivennumber**

voidmain()

{

int n,i,f;f=i=1;clrscr();

printf("enteranumber");scanf("%d",&n);while(i<=n)

{

f\*=i;i++;

}

printf("thefactorialof%dis%d",n,f);getch();

}

# Result:

Enteranumber

Thefactorialof5is120

# Questions;

* 1. WhataretheLoops(IterativeStatements)?
	2. WhataretheDifferencesbetweenwhile()anddo..while()?
	3. Explainaboutfor()loop.

# Experiment 8:

1. **AIM:Programtogenerateprimenumbertillnthnumber**
2. **ALGORITHM:**

Step1:start

Step2: read n valueStep3: for i=1 i<=nStep4:repeatabcdea)factorialequalto0

1. fori=1,j<=1repeatc,d
2. ifipercentagejequaltozero

Start

Taken,i,j

i=1,

1. factequaltofactorialaddedwithone
2. iffactorialequalto2printasprimenumberstep5:displaytheprimenotillnthnum

6:stop

## FLOWCHART:

**Programtogenerateprimenumbertillnthnumber.**



ifi<n

Printi,j++

Printi

j=1,fact=0

Ifi%j=0

Iffact=2

Ifj<=n



Stop

## PROGRAM:

**Programtogenerateprimenumbertillnthnumber**

voidmain()

{

int n,i,fact,j;printf("entertherange");scanf("%d",&n);

printf(“Primenumbersare\n”);for(i=1;i<=n;i++)

{

fact=0;for(j=1;j<=n;j++)

{

if(i%j==0)fact++;if(f==2)printf("%d“,i);

}

getch();

}

## Result:

Enter the range 10Prime numbers are357

# Experiment 9:

1. **AIM:Programtofindsumofnnaturalnumbers**

# Algorithm:

### Step1:startStep2:readn

Step3:i=0,sum=0

### Step4:performfromstep5tostep6untili<=nStep5:i++

Step6:sum+=i;Step7:writesumStep8:stop

start

Readn

i=0;sum=0

1. **Flowchart:**

i++

While(i<=n)

Sum+=i

F

Writesum

T

stop

# Program:

### #include<stdio.h>#include<conio.h>main()

{

### intn,i=0,sum=0;clrscr();

printf(“EnterLimit:“);scanf(“%d”,&n);while(i<=n)

### {i++;

sum+=i;

### }

printf(“Sumof%dnaturalnumbers=%d”,n,sum);getch();

}

# Result:

### EnterLimit:10

Sumof10naturalnumbers=55

# Experiment 10:

1. **AIM:Programtofindtotalofevenintegers**
2. **ALGORITHM:**

step1: start

step2: for i=0;i<20;i++if(a[i]%2==0)sum=sum+a[i];

step3: stop

Tofindsumofeveninteger

## FLOWCHART:

**Programtofindtotalofevenintegers**

Start

Takei, a[20],sum

i=0

If

I++

Sum=sum+a[i],i++

Stop

DisplaySum

## PROGRAM:

**Programtofindtotalofevenintegers**

#include<stdio.h>main()

{

int a[20],i,sum=0;printf("enter5integrs");for(i=0;i<5;i++)scanf("%d",&a[i]);for(i=0;i<5;i++)

{

if(a[i]==0)sum=sum+a[i];

}

prinf("sum=%d",sum);getch();

}

# Result:

Entger5integers

24682

Sum=22

## Experiment11:

Stop

DisplaySum

1. **AIM:Programtofindtotalofoddintegers**

## ALGORITHM:

step1:start

step2:for(i=0;i<20;i++)

{

if(a[i]%2==1)sum=sum+a[i];

}

step3:stop

## FLOWCHART:

Start

Takei, a[20],sum

i=0

**Programtofindtotalofoddintegers**

If

(A[i]%2==1)

I++

Sum=sum+a[i],i++

## PROGRAM:

**Programtofindtotalofoddintegers**

#include<stdio.h>main()

{

int a[20],i,sum=0;printf("enter5integrs");for(i=0;i<5;i++)scanf("%d",&a[i]);for(i=0;i<5;i++)

{

if(a[i]==1)sum=sum+a[i];

}

prinf("sum=%d",sum);getch();

}

## Output:

Enter5integers

12345

Sum=9

# Experiment 12:

**Programtofindsumofallevenintegers**

voidmain()

{

int i,n,sum;sum=0;clrscr();

printf("enteranynumber");scanf("%d",&n);for(i=2;i<=n;i++)

{if(i%2==0)sum=sum+i;

}

printf("totalnoofevenintegeris%d",sum);

}

**5)Result:**

Enteranynumber10Sum= 30

# Experiment 13:

1. **AIM:Programtofindsumofalloddintegers**
2. **ALGORITHM:**

Step1: startStep2: read I,nStep3:sum=0,i=0

Step4:if(i<=n)theni=i+1elsegoto2Step5: if (i%2!=0) then sum++Step6:printsum

Step7:stop

## FLOWCHART:

**Programtofindsumofalloddintegers**

Start

Takei,a[20],sum

i=0

If

Stop

i++

Sum=sum+a[i],i++

DisplaySum

## PROGRAM:

**Programtofindsumofalloddintegers**

voidmain()

{

int i,n,sum;sum=0;clrscr();

printf("enteranynumber");scanf("%d",&n);for(i=1;i<=n;i++)

{if(i%2!=0)sum=sum+i;

}

printf("totalnoofevenintegeris%d",sum);

}

## Result:

Enteranynumber10Sum= 25

# Experiment 14:

1. **AIM:Programtoprintproductoftwomatrices**
2. **ALGORITHM:**

Step1:start

Step2:readI,j,k,a[3][3],b[3][2],c[3][2]Step3:reada[3][3] &b[3][2]

Step4:i=0,j=0,k=0

Step5: if i<3 then i++ else goto 1Step6: if j<3 then j++ else goto 5Step7: if k<3 then k++ else goto 6Step8:c[i][j]=c[i][j]+a[k][j]\*b[i][k]

Start

Takea[3][3],b[3][3],c[3][3],i,j,k

I=0,j=0,k=0

Step9:printa[i][j],b[i][j],c[i][j]Step10: stop

## FLOWCHART:

**Programtoprintproductoftwomatrices.**

Ifi<=20

Stop

 if

(i<n)

ifj<n

For(k=0;j<k.k++)

k++

j++

i++

C[i][j]=c[i][j]+a[k][j]\*b[i][k]

Displayc[i][j]

## PROGRAM:

**Programtoprintproductoftwomatrices**

#include<stdio.h>voidmain()

{

inti,j,k,a[3][3],b[3][2],c[3][2];

printf("enterelementsofmatrixa");for(i=0;i<3;i++)

{

for(j=0;j<3;j++)scanf("%d",&a[i][j]);

}

printf("enterelementsofmatrixb");for(i=0;i<3;i++)

{

for(j=0;j<2;j++)scanf("%d",&b[i][j]);

}

for(i=0;i<3;i++)

{

for(j=0;j<3;j++)

{c[i][j]=0;

for(k=0;k<3;k++)

{

c[i][j]=c[i][j]+a[i][k]\*b[k][j];printf("\t%d",c[i][j]);

}

printf("\n");

}

}

}

}

## Result:

Entertheelementsofmatrixa124 521452

Entertheelementsofmatrixb124 521452

|  |  |  |
| --- | --- | --- |
| 10 | 18 | 28 |
| 50 | 18 | 7 |
| 40 | 45 | 14 |

# Experiment 15:

1. **AIM:ProgramtoprintFibonacciseries**
2. **ALGORITHM:**

### Step1:start

Step2: read I,x,f,f1,f2Step3: f=0,f1=1,f2=1Step4:do

### I++F1=f2F2=fF=f1+f2

While (i<=n)Step5: print fStep6:stop

Start

TakeI, x,f,f1, f2

F=0,f1=1,f2=1

## FLOWCHART:

**ProgramtoprintFibonacciseries**

While(i<=n)

I++,F1=f2;f2=f

Stop

F=f+f2



F=f+f2

DisplayF

## PROGRAM:

**ProgramtoprintFibonacciseries**

voidmain()

{

int i,n,f,f1,f2;printf("entertherange");scanf("%d",&n);

f=0;f1=1;f2=1;

do

{i++;

printf("%d\n",f);f1=f2;

f2=f;f=f1+f2;

}

while(i<=n);

}

## Result:

Entertherange901123581321

**Experiment16:PrinttheFollowingformats**

16.1)1 16.2)1 16.3)1 16.4)1

22 22 22 23

333 3 3 333 45 6

1. **AIM:programtoprintthefollowingformat1**

**1 2**

**2 3 3**

**3 4 4 4**

## ALGORITHM:

step1:startstep2:takeI,jandn

step3:for(i=1;i<n;i++)for(j=0;j<i;j++)

{

printf(”%d”,i);

printf(”\n”);

}

step4:stop

Start

TakeI,j,n,i=1,j=1

If

## FLOWCHART:

**Programtoprintthefollowingformat**

|  |  |  |
| --- | --- | --- |
| **1** |  |  |
| **2** | **2** |
| **3** | **3** | **3** |  |
| **4** | **4** | **4** | **4** |

i<n

If

Stop



Displayi

Display“\n”

J++

I++

## PROGRAM:

**Programtoprintthefollowingformat1**

|  |  |  |  |
| --- | --- | --- | --- |
| **2** | **2** |  |  |
| **3** | **3** | **3** |  |
| **4** | **4** | **4** | **4** |

#include<stdio.h>main()

{

inti,j,n;

printf(“enternvalue”);scanf(“%d”,&n);for(i=0;i<=n;i++)

{

for(j=0;j<i;j++)printf(”%d”,i);

printf(”\n”);

}

printf(”\n”);

}

## Result:

1

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 2 |  |  |
| 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |

## Experiment16.2:

1. **AIM:Programtoprintthefollowingformat**

## ALGORITHM:

**1**

**22**

**3 3 3**

**4 4 44**

step1:start

step2:takethreeintegersi,j,n

step3:repeatstep4tostep6fori=1,i<=n,i++step4:repeatstep5forj=1,j<=n,j++

step5: if j>=1 thenDisplayIandaspaceElse

Displayspace

step6:transfercursortomeetlinebyprinting‘\n’step7:stop

## FLOWCHART:

**Programtoprintthefollowingformat1**

Start

Takei,j,n

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

**2 2**

**3 3 3**

**4 4 4 4**

If(j>i)

Displayi

Display“\n”

I++

Stop

Display“\n”

Display“\t”



## PROGRAM:

**Programtoprintthefollowingformat1**

**22**

**3 3 3**

**4 4 44**

#include<stdio.h>main()

{

int i,j=0,n;printf(“enternvalue”);scanf(“%d”,&n);for(i=0;i<=n;i++)

{

if(j>=i)printf(”%d\t”,i);elseprintf(”\n”);

}

printf(”\t”);

}

printf(“\n”);

}

## Result:

**1**

**22**

**3 3 3**

**4 4 44**

# Experiment 16.3:

1. **AIM:Programtoprintthefollowingformat**
2. **ALGORITHM:**

**1**

**2 2**

**33 3**

step1:start

step2:takethreeintegersi,j,k

step3: repeat step2 to step8 for i=1,i<=n,i++step4:repeatstep3tostep4fork=1,k<=n-i,k++step5: displayblank space

step6:repeatstep5tostep7forj=1,j<=I,j++step7: displayblankspace

step8:takecursortonewlinestep9: stop

## FLOWCHART:

**Programtoprintthefollowingformat1**

**22**

Start

Takei,j,n,k=0,j=1

If

Stop

I<n

**33 3**

K<n



Display“\n”

If

Display”\n”

Displayi

J++

I++

## PROGRAM:

**Programtoprintthefollowingformat1**

**2 2**

**3 3 3**

#include<stdio.h>main()

{

inti,j,k,n;

printf(“enternvalue”);scanf(“%d”,&n);for(i=0;i<=n;i++)

{

for(k=0;k<=n-i;k++)

{

printf(””);

}

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

{

printf(””);

printf(”i”);

}

}

## Result:

**1**

**2 2**

**33 3**

## Experiment16.4:

1. **AIM:Programtoprintthefollowingformat**

## ALGORITHM:

**1**

**23**

**456**

step1:start

step2:takethreeintegersi,j,k,nandinitializekas1step3:repeatstep4tostep7fori=1,i<=n,i++

step4:repeatstep5tostep6forj=1,j<=i,j++step5: displayvalueofk

step6:incrementkby1

Start

TakeI=0,j=0,k

K=0

step7:transfercursortonextlinebyprinting‘\n’step8:stop

## FLOWCHART:

**Programtoprintthefollowingformat1**

**23**

**456**

IfI<=n

ifj<=n

K=k+1

DisplayK

Stop

Display“\n”

J++

I++

## PROGRAM:

**Programtoprintthefollowingformat1**

**23**

**456**

#include<stdio.h>main()

{

int i,j,k=1,n;printf(“enternvalue”);scanf(“%d”,&n);for(i=0;i<=n;i++)

{

for(j=0;j<=i;j++)printf(”%d\t”,k++);

printf(”\n”);

}

}

## Result:

**1**

**23**

**456**

# Experiment 17:

1. **AIM:programtoreadnumofstudentdata**
2. **ALGORITHM:**

step1:takeacharacterarraya,integersr,s,I,jandnstep2: readthevalueofn

step3: for(i=0;i<n;i++)Enterrollno,name,,,,,,

Readtheseandenter5subjectmarks

Start

Taken[20][20],r[20],s[20],I=0,j,n

s[i][5]=0;

for(j=0;j<5;j++)

{

scanf(“%d”,s[i][j]);

s[i][5]=s[i][5]+s[i][j];

}

step4:displayn[i],r[i],s[i][j]step5:stop

## FLOWCHART:

ReadName,RollNo

Read5SubjectsMarks

I++

IfI<n

Stop

**Programtoreadnumofstudentdata:**

If

I<n

I=0

Displayn[i],r[i]

If

J++

Displays[i][j]

J=0

## PROGRAM:

**Programtoreadnumofstudentdata**

#include<stdio.h>#include<conio.h>voidmain()

{

charn[20][10];

int i,j,r[20],s[20][6];printf("enternvalue");scanf("%d",&n);for(i=0;i<n;i++)

{

printf("entername,rollno, ");

scanf("%s%d",&n[i],&r[i]);printf("enter5subjectmarks");s[i][5]=0;

for(j=0;j<5;j++)

{

scanf("%d",s[i][j]);

s[i][5]=s[i][5]+s[i][j];

}

}

printf("thedataenteredis\n");for(i=0;i<n;i++)

{

printf("%s\t%d\t",n[i],r[i]);for(j=0;j<5;j++)printf("%d\t",s[i][j]);

}

getch();

}

## Result:

Enter name,rollno,….Eswar 20Enter5subjectmarks

1050340642

Thedataenteredis

Eswar 20 10 50 34 06 42

# Experiment18.1:

1. **AIM:Programtofindfactorialofagivennumber**
2. **ALGORITHM:**

**step1:start**

Step2:takeanumbernStep3:readanumbernFor(i=0;i<n;i++)Factorial=fact\*I;Display numStep4:stop

## FLOWCHART:

**Programtofindfactorialofagivennumber:**

Start

Taken

F=i=1

If

Stop

f=f\*i;i=i+1

Displayf

## PROGRAM:

**Programtofindfactorialofagivennumber**

#include<stdio.h>#include<math.h>voidmain()

{

clrscr();

printf("enteranumber");fact();

getch();

}

fact()

{

int i,fact=1,n;scanf("%d",&n);for(i=1;i<=n;i++)

{

fact=fact\*i;

}

printf("\nfactorialofagivennois:%d",fact);returnfact;

}

## Result:

Enteranumber5

Factorialofagivennois:120

## Experiment18.2:

1. **AIM:Programtofindfactorialofagivennumber**

## ALGORITHM:

step1:start

Step2:takeanumberIandfact=1Step3: read a number nFor(i=0;i<n;i++)

Factorial=fact\*i;Display factStep4:stop

Start

Taken

## FLOWCHART:

**programtofindfactorialofagivennumber**

FunctionFact(n)Calling

Fact(n)

If

Stop

f=f\*i;i=i+1

F=i=1

Displayf

## PROGRAM:

**programtofindfactorialofagivennumber**

#include<stdio.h>#include<math.h>voidmain()

{

clrscr();

printf("enteranumber");fact();

getch();

}

fact()

{

int i,fact=1,n;scanf("%d",&n);for(i=1;i<=n;i++)

{

fact=fact\*i;

}

printf("\nfactorialofagivennois:%d",fact);returnfact;

}

## Result:

Enteranumber5

Factorialofagivennois:120

# Experiment 19:

1. **AIM:Programonfunctiontoscanacharacterstringandconvertlowercasecharactertouppercase**
2. **ALGORITHM:**

step1:start

Step2:takeastringafunctionofreturnvaluedatatypeisvoidstrupperStep3:reada string

While(s[i]!=’\0’)

{

if((s[i]>=’a’) &&(s[i]<=’z’))s[i]=s[i]-32;

i++;

}

display changed string.Step4:stop

## FLOWCHART:

**Programonfunctiontoscanacharacterstringandconvertlowercasecharactertouppercase**

Start

Takestr,I,j,

While

If

((S[i]>=’a’)

Stop

I++

S[i]=s[i]-32

## PROGRAM:

**Programonfunctiontoscanacharacterstringandconvertlowercasecharactertouppercase**

#include<stdio.h>#include<conio.h>voidmain()

{

charstr;

printf("enter a string");scanf("%s",str);to\_str\_upper(char[]);printf("changedto%s",str);

}

voidto\_str\_upper(char[])

{

int i=0;while(s[i]!='\0')

{

if((s[i]>='a')&&(s[i]>='z'))s[i]=s[i]-32;

i++;

}

}

}

## Result:

Enterastringgnec

changedtoGNEC

## Experiment20:

1. **AIM:Aprogramtoextractaportionofcharacterstringandprintextractedstring**

## ALGORITHM:

step1:start

Step2:takeaaandrcharactersarraysandI,j,m,nbeuntegersStep3:enterthevaluesofm,n

J=0;

For(i=n-1;i<m+n-1;i++)

{

r[j]=s[i];j++;

}

step4:displaytheextractpartofstringStep5:stop

## FLOWCHART:

**Aprogramtoextractaportionofcharacterstringandprintextractedstring**

Start

Take

s[30],r[30],j=0,

I=n-1

If

I<m+nm-1

Stop

I++

J++

r[j]=s[i]

## PROGRAM:

**Programtoextractaportionofcharacterstringandprintextractedstring**

#include<stdio.h>voidmain()

{

char s[30],r[30];inti,j,m,n;

clrscr();

printf("entera string");gets(s);

printf("enterthevaluesofmn");scanf("%d%d",&m,&n);

j=0;

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

{

r[j]=s[i];j++;

}

printf("theextractpartofstring%s:",r);getch();

}

## Result:

EnterastringGurunanak

Enterthevaluesofm,n35

Theextractpartofstring:run

## Experiment21:

1. **AIM:Programtoreadfivecitiesandsortthemandprintsortedlistofcitiesinalphabeticalorder**

## ALGORITHM:

Start

Takecity[5][20],I,j

I=0

step1:start

Step2:enter 5 city namesStep3:takeIandjloopvariablesFor(i=65;i<122;i++)

{

for(j=0;j<5;j++)

{

if(city[j][0]==i)

printf(”\n%s”,city[j]);

}

}

Step4:stop

## FLOWCHART:

**AprogramtoreadfivecitiesandsortthemandPrintsortedlistofcitiesinalphabeticalorder**

J=0

EnterCityNames

I++

ifI<122

If(i<5)

ifj<5

Stop

If(City[j][0]==i)

Displaycity[j]

J++]

I++

## PROGRAM:

**Aprogramtoreadfivecitiesandsortthemandprintsortedlistofcitiedinalphabeticalorder**

#include<stdio.h>#include<conio.h>voidmain()

{

ch city[5][20];int I,j;clrscr();

printf("enterthenamesofcities...\n\n");for(i=0;i<5;i++)

scanf("%s",&city[i]);printf("sortedlistofcities...\n\n");for(i=65;i<122;i++)

{

for(j=0;j<5;j++)

{

if(city[j][0]==i)

printf("\n%s",city[j]);

}

}

}

## Result:

Enterthenamesofcities

HydChennaiBombaygoavizagSortedlistofcities

BombayChennaiGoaHydvizag

## Experiment22:

Stop

If

1. **AIM:Programtofindthefactorialofanumberusingrecursion**

## ALGORITHM:

step1:start

Step2: enter f and nStep3:readanumbernF=factorial(n);

Step4:insidethefunctional(x)definealocalvariable‘x’If(x==l)

Return (l);Else

Fact=x\*factorial(x-l);

Return(fact);Step5:stop

Start

Taken

## FLOWCHART:

**Tofindthefactorialofanumberusingrecursion**

FunctionFact(n)Calling

Fact(n)

f=f\*i;i=i+1

F=i=1

Displayf

## PROGRAM:

**Tofindthefactorialofanumberusingrecursion**

#include<stdio.h>main()

{

int f,n;clrscr();

printf("enter n");scanf("%d",&n);f=factorial(n);printf("%d",f);getch();

}

factorial(x)

{

int i,fact=1;if(x==1)return(1);else

fact=x\*factorial(x-1);return(fact);

}

## RESULT:

Entern4

24

## Experiment23:

1. **Aim:programtoprintaddressofavariable**

## Algorithm:

Step1: start

Step2: declarea

Step3: print&a

Step4: stop

## Flowchart:

start

Declarea

stop

Print&a

1. **Program:**

#include<stdio.h>#include<conio.h>main()

{

int a;clrscr();

printf(“Addressofa=%u“,&a);getch();

}

# Result:

Addressofa=64453

## Experiment24:

1. **AIM:programtoillustrateaccessingthevalueofvariableusingpointersusingarithmeticoperations**

## ALGORITHM:

step1:start

step2:takea,b,x,y,zandtwopointersvariables\*p1,\*p2step3:assignvaluestothesevariables

p1=&a;p2=&b;x=\*p1\*p2-6;

y=(4\*-\*p2)/(\*p1+10);display x and ystep4:\*p2=\*p2+3

\*p1=\*p2-5;z=\*p1\*p2-6;display a,b and zstep5:stop

Start

a=12,b=4

P1=&a,p2=&b

## FLOWCHART:

**A program to illustrate accessing the value ofvariableusingpointersusingarithmeticoperations**

X=\*p1\*p2-6



Y=(4-\*p2)/\*p1+10

Displayp1,p2,a,b,x,y

\*p2=\*p2+3,\*p1=\*p2-5

Z=\*p1\*p2-6

Stop

Displaya,b,z

## PROGRAM:

**Aprogramtoillustrateaccessingthevalueofvariableusingpointersusingarithmeticoperations**

#include<stdio.h>main()

{

int a,b,\*p1,\*p2,x,y,z;clrscr();

a=12,b=4;

p1=&a; p2=&b;x=\*p1\*\*p2-6;

y=(4-\*p2)\*\*p1+10;printf("addressofa=%d\n",p1);printf("addressofb=%d\n",p2);printf("a=%d,b=%d\n",a,b);

printf("x=%d,y=%d\n",x,y);

\*p2=\*p2+3; \*p1=\*p2-5;z=\*p1\*\*p2-6;printf("a=%d,b=%d\n",a,b);

printf("z=%d\n",z);getch();

}

## RESULT:

Addressofa=65543Addressofb=64455a=12b= 4

z=42

## Experiment24:

1. **AIM:Programtoillustratetheaddressofavariableusingvariousmethods**

## ALGORITHM:

step1:start

step2:takex,p,qandacharacterastep3:displaya,x,p,q

step5:stop

## FLOWCHART:

**Aprogramtoillustratetheaddressofavariableusingvariousmethods**

Start

a=’a’,x=125,p=10.25,

q=18.76

Displaya, &a

Displayx,&x

Displayp,&p

Displayq,&q

Stop

Z=\*p1\*p2-6

## PROGRAM:

**Aprogramtoillustratetheaddressofavariableusingvariousmethds**

#include<stdio.h>main()

{

char a;int x;float p,q;clrscr();

a='a';x=125;

p=10.25,q=18.76;

printf("%cisstoredataddress%u\n",a,&a);printf("%disstoredataddress%u\n",x,&x);printf("%fisstoredataddress%u\n",p,&p);printf("%fisstoredataddress%u\n",q,&q);getch();

}

## Result:

a is stored at address 65525125isstoredataddress65522

10.250000isstoredataddress65518

18.760000isstoredataddress65514

## Experiment25:

1. **AIM:Programtoprinttheelementsofarrayusingpointers**

## ALGORITHM:

step1:start

step2:takeanarrayaof5elementsandapointerpstep3:printalltheelmentsofarray

step5:stop

## FLOWCHART:

**Aprogramtoprinttheelementsofarrayusingpointers**

Start

Takea[5]={5,4,6,8,9},\*p=&a[0],i=0

If

I<5

Stop

I++

Display(p+i)

Display\*(p+i)

## PROGRAM:

**Programtoprinttheelementsofarrayusingpointers**

#include<stdio.h>main()

{

inta[5]={5,4,6,8,9};

int \*p=&a[0];inti;

clrscr();for(i=0;i<5;i++)printf("%d",\*(p+i));for(i=0;i<5;i++)printf(" %u\n",(p+i));getch();

}

## Result:

12345

12345

## Experiment26:

Return(z)

Z=\*x+\*y

Stop

1. **AIM:Programtoimplementcallbyreferences**

## ALGORITHM:

step1: startstep2:takea,b,c

step3:takeadditionasafunctionandstoretheaddressofaandbasfunctionandstoretheaddressofaandbasargumentsinit

step5:takexandyasformalvariablesstoreinzstep6:returnz

step7:stop

## FLOWCHART:

**Aprogramtoimplementcallbyreferences**

Start

Takea=10,b=20

C=add(&a,&b)

Displayc

Add(int \*x,int\*y)

## PROGRAM:

**Aprogramtoimplementcallbyrefers**

#include<stdio.h>main()

{

int a=10,b=20,c;clrscr();

c=add(&a,&b);printf("%d",c);getch();

}

add(int\*x,int\*y)

{

int z;z=\*x+\*y;return(z);

}

## Result:

30

## Experiment27:

I++

Max=\*(arr+i)

I=o

If

If

1. **AIM:Programtofindgreatestofnumbersfunctionsandpointers**

## ALGORITHM:

step1:start

step2:takeanarraya[20]andthreeintegersc,n,gx,p,qandacharacterastep3:acceptvalueofnfromtheuserdisplaya,x,p,q

Start

Takea[10],i=0,n,l

If

I++

Reada+I

step5:repeatstep4fori=0,i<n,i++

step6: accept value for user and store at a+istep7:gotostepa&sendaandnasargumentsstep8:displayvaluereturnfromstep2

step9:stop

## FLOWCHART:

**Aprogramtofindgreatestofnumbersfunctionsandpointers**

L=max(a,n)

Max(int\*arr,ints)

Return(max)

Stop

DisplayL

## PROGRAM:

**Aprogramtofindgreatestofnumbersfunctionsandpointers**

#include<stdio.h>main()

{

int a[20],i,n,l;clrscr();

printf("entertheno.ofelements:");scanf("%d",&n);

for(i=0;i<n;i++)scanf("%d",&a[i]);l=max(a,n);

printf("thelargestnumis:%d",l);getch();

}

intmax(int\*arr,ints)

{

int max,i;for(i=0;i<;i++)if(i==0||max<\*(arr+i))max=\*(arr+i);

return(max);

}

## Result:

Enternumberofelements3564

Thelargestnumberis6

## Experiment28:

1. **AIM:Programtoprinttheelementsofastructureusingpointers**

## ALGORITHM:

step1:start

step2:takeacharacterarrayname,anumberandpriceinstructurestep3:inmaintakeastructvariableproductandapointer

for(\*ptr=product;ptr<product+3;ptr++)readthevaluebyusingarrayoperator

ptr->name,ptr->no,ptr->pricestep4: display name,no,pricestep5: stop

## FLOWCHART:

**Aprogramtoprinttheelementsofastructureusingpointers**

Start

Takeproduct[3],\*ptr



IfPtr<product+3

Read ptr->name, &ptr->number,&ptr->price

while

Ptr<product+3

Start

Ptr++

Displayptr->name,Ptr=>number,

Ptr=product

## PROGRAM:

**Aprogramtoprinttheelementsofastructureusingpointers**

#include<stdio.h>structinvest

{char name[20];int number;float price;};main()

{

structinvestproduct[3],\*ptr;clrscr();

printf("input\n\n");for(\*ptr=product[3];ptr<product+3;ptr++)scanf("%s%d%f",ptr->name,&ptr->number,&ptr->price);printf("\nResult\n\n");

ptr=product;while(ptr<product+3)

{

printf("%20s%5d%10.2f\n",ptr->name,ptr->number,ptr->price);ptr++;

}

getch();

}

## Experiment29:

Stop

Displayname,rollno,age

1. **AIM:Programtodisplaystudentinformationbyinitializingstructures**

## ALGORITHM:

step1:takename,rollnoandageinsidethestudentstructurestep2: entertherequireddata

step3:stop

## FLOWCHART:

**Aprogramtodisplaystudentinformationbyinitializingstructures**

Start

StructStudent

Takename,Rollno,age

## PROGRAM:

**Aprogramtodisplaystudentinformationbyinitializingstructures**

#include<stdio.h>structstudent

{

char name[10];introllno;

intage;

};

main()

{

staticstructstudents1;clrscr();

printf("enter the name,rollno,age");scanf("%s%d%d\n",&s1.name,&s1.rollno,&s1.age);printf("%s %d %d",s1.name,s1.rollno,s1.age);getch();

}

## Result:

Ente name, rollno,ageRavi1125

Ravi1125

## Experiment30:

Start

Structstudents

1. **AIM:Programtofindthetotalno.ofmarks**

## ALGORITHM:

step1:takename,rollnoandtotalinsidethestructurestep2: enter the marks of five subjectsfor(i=0;i<n;i++)

If

I<n

Start

I++

DisplayTotal

S[i].total=0

EnterMarksofFiveSubjects,

EnterNO.ofStudents

printf("enters[%d]studentmarks",i);s[i].total=0;

for(j=0;j<5;j++)

read the value of s[i].subject[j]s[i].total=s[i].total+s[i].subject[j];step3:displays[i].total

step4:stop

## FLOWCHART:

**Aprogramtofindthetotalno.ofmarks**

If

j<5

J++

S[i]=s[i].total+s[i].subject[j]

J=0



## PROGRAM:

**Aprogramtofindthetotalno.ofmarks**

#include<stdio.h>structstudent

{

char name[10];introllno;

intsubject[5],total;

};

main()

{

staticstructstudents[100];intn,i,j;

clrscr();

printf("entertheno.ofstudents");scanf("%d",&n);

printf("enterthemarksoffivesubjects");for(i=0;i<n;i++)

{

printf("enters[%d]studentmarks",i);s[i].total=0;

for(j=0;j<5;j++)

{

scanf("%d",&s[i].subject[j]);

s[i].total=s[i].total+s[i].subject[j];

}

printf("%d",s[i].total);

}

}

# Result:

entertheno.ofstudents2

enterthemarksoffivesubjectsenters[0]studentmarks12

3

4

5

15enters[1]studentmarks1232

14

15

65

138

**Assignment1:Basicproblemsolving**

**Dateofissue: DueDate:**

**Problem1)Pythagoreantriple:**ThreenumbersformaPythagoreantripleifthesumofsquaresoftwonumbersisequaltothesquareofthethird.

Forexample,3,5and4formaPythagoreantriple,since3\*3+4\*4=25=5\*5

Youaregiventhreeintegers,a,b,andc.Theyneednotbegiveninincreasingorder.IftheyformaPythagoreantriple,thenprint"yes",otherwise,print"no".Pleasenotethattheoutputmessageisinsmallletters.

|  |  |  |
| --- | --- | --- |
|  | **Input** | **Output** |
| Test Case1 | 354 | yes |
| Test Case2 | 582 | no |

**Problem2)Sumofpowersofnumber:**Inthisprogram,youaregivenaninputN,whichisapositiveintegerlessthanorequalto40.WriteaprogramtofindthesumsoffourthpowersofthefirstNnumbers.

ExInput:n=2(1^4+2^4)Output: 17

|  |  |  |
| --- | --- | --- |
|  | **Input** | **Output** |
| Test Case1 | 2 | 17 |
| Test Case2 | 1 | 1 |

**Problem3)Triangularmatrix:**Inthisassignment,youwillbegivenanNxNmatrix.Youhavetodeterminewhetherthematrixisatriangular matrix.

ThediagonalofthematrixMofsizeNxNisthesetofentriesM(0,0),M(1,1),M(2,2),...,M(N,N).Amatrixis*uppertriangular*ifeveryentry*below*thediagonalis0.Forexample,

111

001

002

isanuppertriangularmatrix.(Thediagonalitself,andtheentriesaboveandbelowthediagonalscanbezeroesornon-zerointegers.)

Amatrixis*lowertriangular*ifeveryentryabovethediagonalis0.Forexample,200

310

422

isalowertriangularmatrix.

|  |  |  |
| --- | --- | --- |
|  | **Input** | **Output** |
| Test Case1 | 21101 | Yes |
| Test Case2 | 3100010112 | yes |
| Test Case3 | 3101010112 | no |

**Problem4)Findthesecondlargest:**Youaregivenasequenceofintegersasinput,terminatedbya-1.(Thatis,theinputintegersmaybepositive,negativeor0.A-1intheinputsignalstheendoftheinput.)

-1isnotconsideredaspartoftheinput.

Findthesecondlargestnumberintheinput.Youmay**not**usearrays.

|  |  |  |
| --- | --- | --- |
|  | **Input** | **Output** |
| Test Case1 | -840-288-261-337-335488-1 | -261 |
| Test Case2 | -840-335-1 | -840 |

**Problem5)Sumofadjacentpairs:**Youaregivenasequenceofnumbers,endingwitha-1.Youcanassumethatareat leasttwonumbers beforetheending -1.

### Letuscallthesequencex0x1...xn-1.

Youhavetooutputthesequenceofsumsofadjacentpairsofnumbers,asfollows:x0+x1x1+x2...xn-1+xn

### Notethatthesumsareseparatedbyspaces.Kindlydonotusearraysinthecode.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Input** | **Output** |  |
| Test Case1 | 45 67-1 | 91113 |

|  |  |  |
| --- | --- | --- |
| Test Case2 | 34 5-1 | 79 |
| Test Case3 | 12-1 | 3 |

**Problem6)Invertedrightangle:**Writeaprogramtodothefollowing:-

1. Takeheighthastheinput
2. Basedontheheight,printhlinesinoutputsuchthattheyformapatternintheshapeofan"inverted"rightangledtriangle
3. EachlineshouldformanArithmeticProgressionwiththestartingelement=row\_numberandcommondifference=1.Takemodulo 10for numbersgreaterthan9

|  |  |  |
| --- | --- | --- |
|  | **Input** | **Output** |
| Test Case1 | 5 | 12345 |
|  |  | 2345 |
|  |  | 345 |
|  |  | 45 |
|  |  | 5 |
| Test Case2 | 14 | 12345678901234 |
|  |  | 2345678901234 |
|  |  | 345678901234 |
|  |  | 45678901234 |
|  |  | 5678901234 |
|  |  | 678901234 |
|  |  | 78901234 |
|  |  | 8901234 |
|  |  | 901234 |
|  |  | 01234 |
|  |  | 1234 |
|  |  | 234 |
|  |  | 34 |
|  |  | 4 |

**Assignments2:Arrays**

**Dateofissue: DueDate:**

**Problem1)**Createanarrayof10elements,input10elementsandthensearchanelementintoarray.

***Input:-***Enter10elements:10,20,30,40,50,60,70,80,90,100Enterelement to besearched:40

***Output:-***Element40foundatloc:4

**Problem2)**Createanarrayof50elements,store10elementsandtheninsertanelementatthefirstlocationofarray...

***Input:-***Enter10Elements:2,3,4,5,6,7,8,9,10,11

Enterelement:1

***Output:-***Arrayafterinserting1:1,2,3,4,5,6,7,8,9,10,11

**Problem3)**Createanarrayof50elements,store10elementandtheninsertanelementatthelastlocationofarray.

***Input:-***Enter10Elements:1,2,3,4,5,6,7,8,9,10

Enterelement:11

***Output:-***Arrayafterinserting1:1,2,3,4,5,6,7,8,9,10,11

**Problem4)**Createanarrayof50elements,store10elementsandtheninsertanelementatthedesiredlocationofarray...

***Input:-***Enter10Elements:1,2,3,5,6,7,8,9,10,11

Enterelement:4

Enterlocation:4

***Output:-***Arrayafterinserting4atloc4:1,2,3,4,5,6,7,8,9,10,11

**Problem5)**WriteaCprogramthat,givenanarrayA[]ofnnumbersandanothernumberx,determineswhetherornotthereexist two elementsinS whosesumisexactlyx

Case1)Input:Array1,4,45,6,10,-8 X= 16Output:Yes

Case2)Input:Array1,4,45,6,10,-8 X= 116Output:No

**Problem6)MajorityElement:**AmajorityelementinanarrayA[]ofsizenisanelementthatappearsmorethann/2times(andhencethereisatmostonesuchelement)(Use**Moore’sVotingAlgorithm**)

Case1)I/P:334244244

O/P:4

Case2)I/P:33424424O/P:NONE

**Problem7)**WriteanefficientCprogramtofindthesumofcontiguoussub-arraywithinaone-dimensionalarrayofnumberswhichhasthelargestsum.(Use**Kadane’sAlgorithm**)

Input:-2,-3,4,-1,-2,1,5,-3

Output:MaxSumis=4 (4+(-1)+(-2)+1+5+(-3))