**Q1. Write a program to print the following pattern using iterative statements.  Your program should ask the user for the pattern size.   
If user input is 5**

**1**

**2 1**

**3 2 1**

**4 3 2 1**

**5 4 3 2 1**

**If user input is 7**

**1**

**2 1**

**3 2 1**

**4 3 2 1**

**5 4 3 2 1**

**6 5 4 3 2 1**

**7 6 5 4 3 2 1**

Program:

#include <stdio.h>

int main()

{

int n,i,j;

printf("Enter the number: ");

scanf("%d",&n);

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

{

for(j=i;j>0;j--)

{

printf("%d ",j);

}

printf("\n");

}

return 0;

}

**OUTPUT:**

Text

Description automatically generated

**Text

Description automatically generated**

**Q2. According to a study, the approximate level of intelligence of a person  can be calculated using the following formula: i=2 + (y+0.5x).**

**Write a program, which will produce a table of values of i, y and x, where y  varies from 1 to 6, and, for each value of y, x varies from 5.5 to 12.5 in steps  of 0.5. Emphasis here is on nested loops. Also, show that for loop here is the  best option.**

**Program:**

#include <stdio.h>

int main()

{

printf("y x i\n");

float x,y,i;

for(y=1;y<=6;y=y+1)

{

for(x=5.5;x<=12.5;x=x+0.5)

{

i=2+(y+0.5\*x);

printf("%f %f %f\n",y,x,i);

}

}

return 0;

}

**A picture containing graphical user interface

Description automatically generated**

**A picture containing graphical user interface

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**3. Write program to check if a number is prime or not using for loop**.

Program:

#include <stdio.h>

int main()

{

int n,i,p=0;

printf("Enter the number: ");

scanf("%d",&n);

if(n==1)

{

printf("The number %d is neither prime nor composite",n);

}

else

{

for(i=2;i<=n/2;i++)

{

if(n%i==0)

{

p=1;

break;

}

}

if(p==1)

printf("The number %d is composite",n);

else

printf("The number %d is prime",n);

}

return 0;

}

**OUTPUT:**

Text

Description automatically generated

**A screenshot of a computer screen

Description automatically generated**

**A screen shot of a person

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**4. Write a program to find if a number is a magic number using do while loop**

**Hint: Find the sum of the digits of the given number. If the product of the sum and the reverse number of the sum is the given number  then the number is the magic number.**

**ex: 1729: Sum of digits: 1+7+2+9=19**

**the reverse of sum: 91**

**product of sum and reverse of sum: 19\*91=1729**

**hence it is magic number.**

Program:

#include <stdio.h>

int main()

{

int num,sum=0,rev=0;

printf("Enter the number: ");

scanf("%d",&num);

int n=num;

while(n!=0)

{

sum+=n%10;

n/=10;

}

printf("The sum of digits: %d\n",sum);

n=sum;

while(n!=0)

{

rev=(rev\*10)+(n%10);

n/=10;

}

printf("The reverse of sum: %d\n",rev);

printf("Product of sum(%d) and reverse of sum(%d): %d\n",sum,rev,rev\*sum);

if(num==(rev\*sum))

{

printf("The number %d is a magic number",num);

}

else

{

printf("The number %d is not a magic number",num);

}

}

**Text

Description automatically generatedOUTPUT:**

Text

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