PF LAB:5

24K-0514

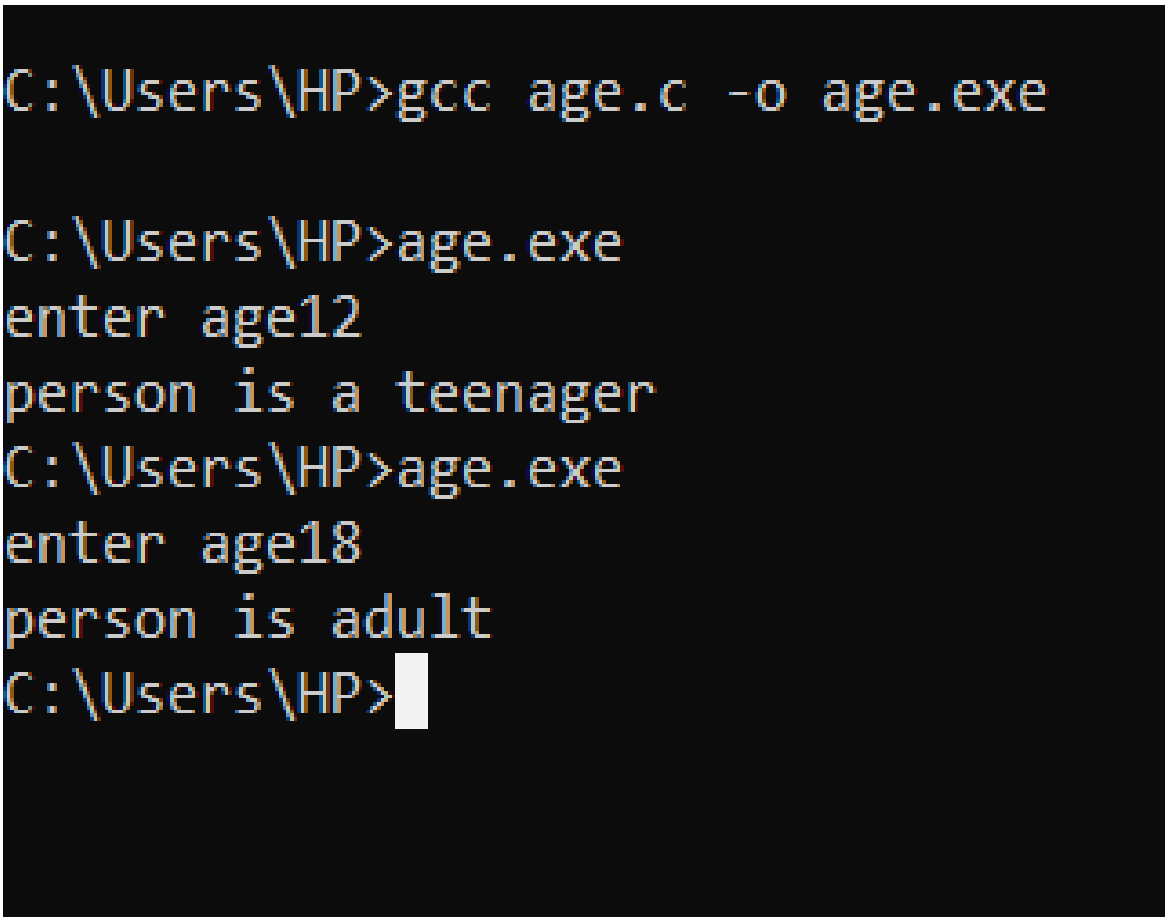
MUHAMMAD UMER FAROOQ

QUESTION 1:

Write a program that categorizes a person's age into different life stages: Child, Teenager, Adult, and Senior, using nested if-else statements.

```c
#include<stdio.h>
int main(){
    int age;
    printf("enter age");
    scanf("%d",&age);

    if(age>=0 && age<=8)
    {
        printf("person is a child");
    }
    else if (age>=9 && age<=15)
    {
        printf("person is a teenager");
    }
    else if(age>=16 && age<=30)
    {
    printf("person is adult");
    }
    else if(age>31)
    {
        printf("person is a senior");
    }
else
{
    printf("invalid age");
}
return 0;
}
```

OUTPUT:


C:\Users\HP>gcc age.c -o age.exe
C:\Users\HP>age.exe
enter age12
person is a teenager
C:\Users\HP>age.exe
enter age18
person is adult
C:\Users\HP>

QUESTION 2:

Create a program that determines if a number is positive, negative, or zero, and if it's positive, checks if it's an even or odd number.

```c
#include<stdio.h>
int main(){
    int number;
    printf("enter number:");
    scanf("%d",&number);
 if(number>0)
    {
    printf("\n number is positive");
        if(number%2==0)
        {
            printf("\n number is even");
        }
        else
        {
            printf("\n number is odd");
        }

    }
else if(number<0)
   {
    printf("number is negative");
   }
else
   {
    printf("number is 0");
   }
return 0;
}
```

OUTPUT:

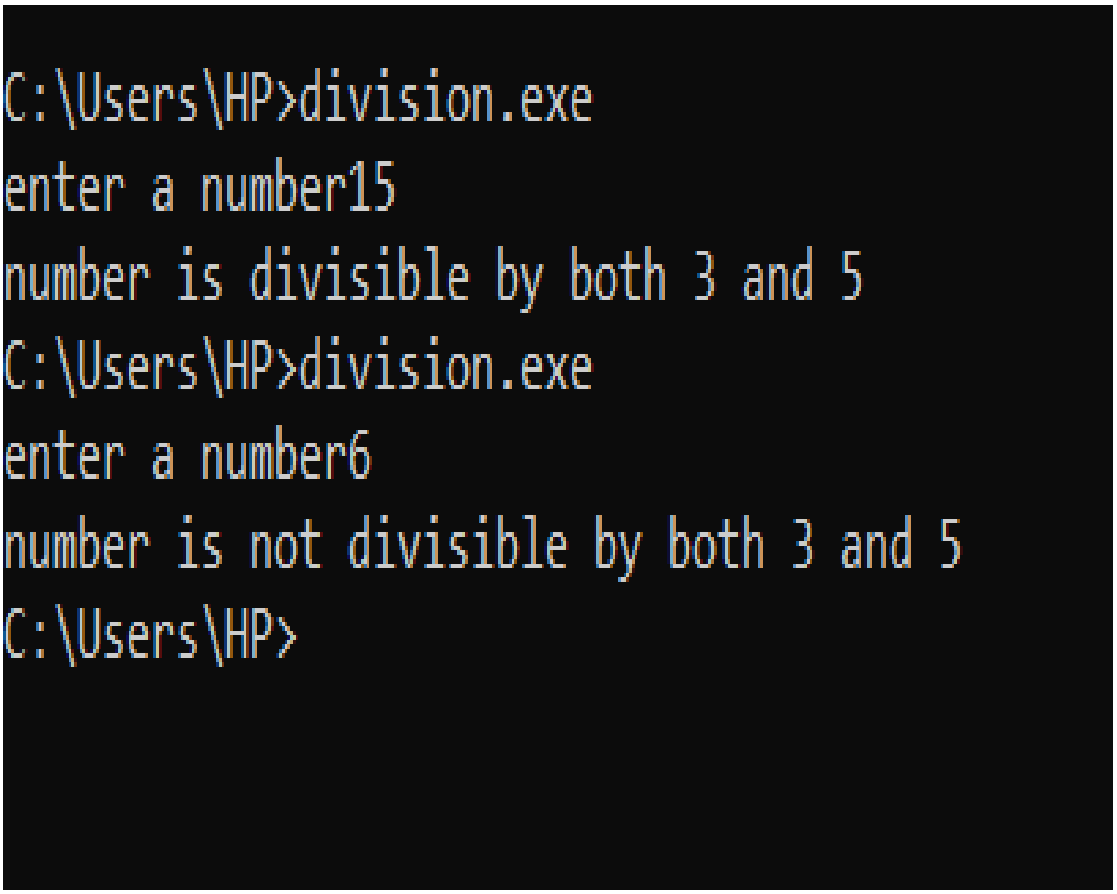
```
C:\Users\HP>evenorodd.exe
enter number:6

 number is positive
 number is even
C:\Users\HP>evenorodd.exe
enter number:7

 number is positive
 number is odd
C:\Users\HP>evenorodd.exe
enter number:-7
number is negative
C:\Users\HP>
```

QUESTION 3:

Write a program that checks if a number is divisible by both 3 and 5 using logical operators.

```c
#include<stdio.h>
int main()
{
    int number;
    printf("enter a number");
    scanf("%d",& number);
    if(number%3==0&&number%5==0)
    {
printf("number is divisible by both 3 and 5");

    }
else{
    printf("number is not divisible by both 3 and 5");
    }
    return 0;
}
```

OUTPUT:

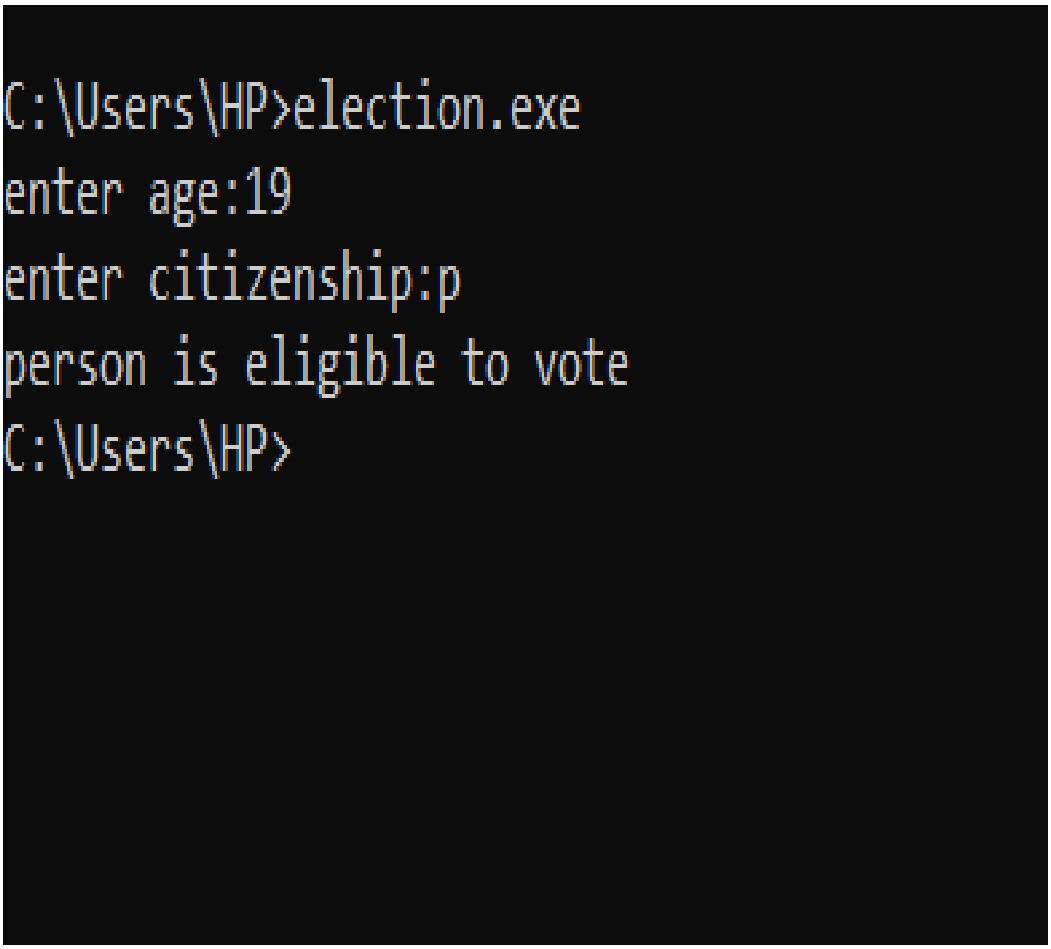

C:\Users\HP>division.exe
enter a number15
number is divisible by both 3 and 5
C:\Users\HP>division.exe
enter a number6
number is not divisible by both 3 and 5
C:\Users\HP>

QUESTION 4:

Create a program that checks if a person is eligible to vote based on their age and citizenship status.

```c
#include <stdio.h>

int main()
{
   int age;
   char citizenship;

   printf("enter age:");
   scanf("%d",&age);
   printf("enter citizenship:");
   scanf(" %c",&citizenship);

   if(age>=18&&citizenship=='p')
   {
       printf("person is eligible to vote");
   }
   else
   {
       printf("person is not eligible to vote");
   }
    return 0;
}
```

OUTPUT:

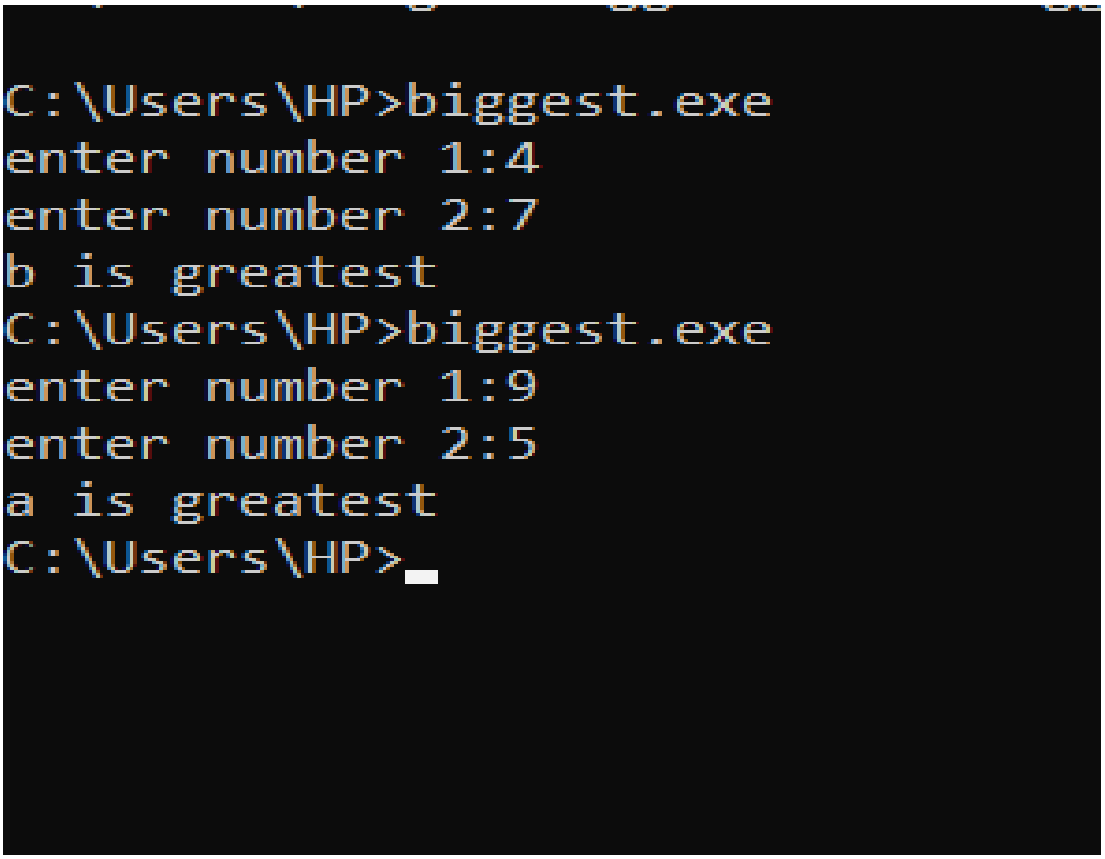

C:\Users\HP>election.exe
enter age:19
enter citizenship:p
person is eligible to vote
C:\Users\HP>

QUESTION 5:

Write a program using a ternary operator to find the maximum of two numbers.

```c
#include <stdio.h>

int main()
{
   int a,b;
   printf("enter number 1:");
   scanf("%d",&a);

   printf("enter number 2:");
   scanf("%d",&b);

   a>b?printf("a is greatest"):b>a?printf("b is greatest"):printf("a and b are equal");
    return 0;
}
```

OUTPUT:

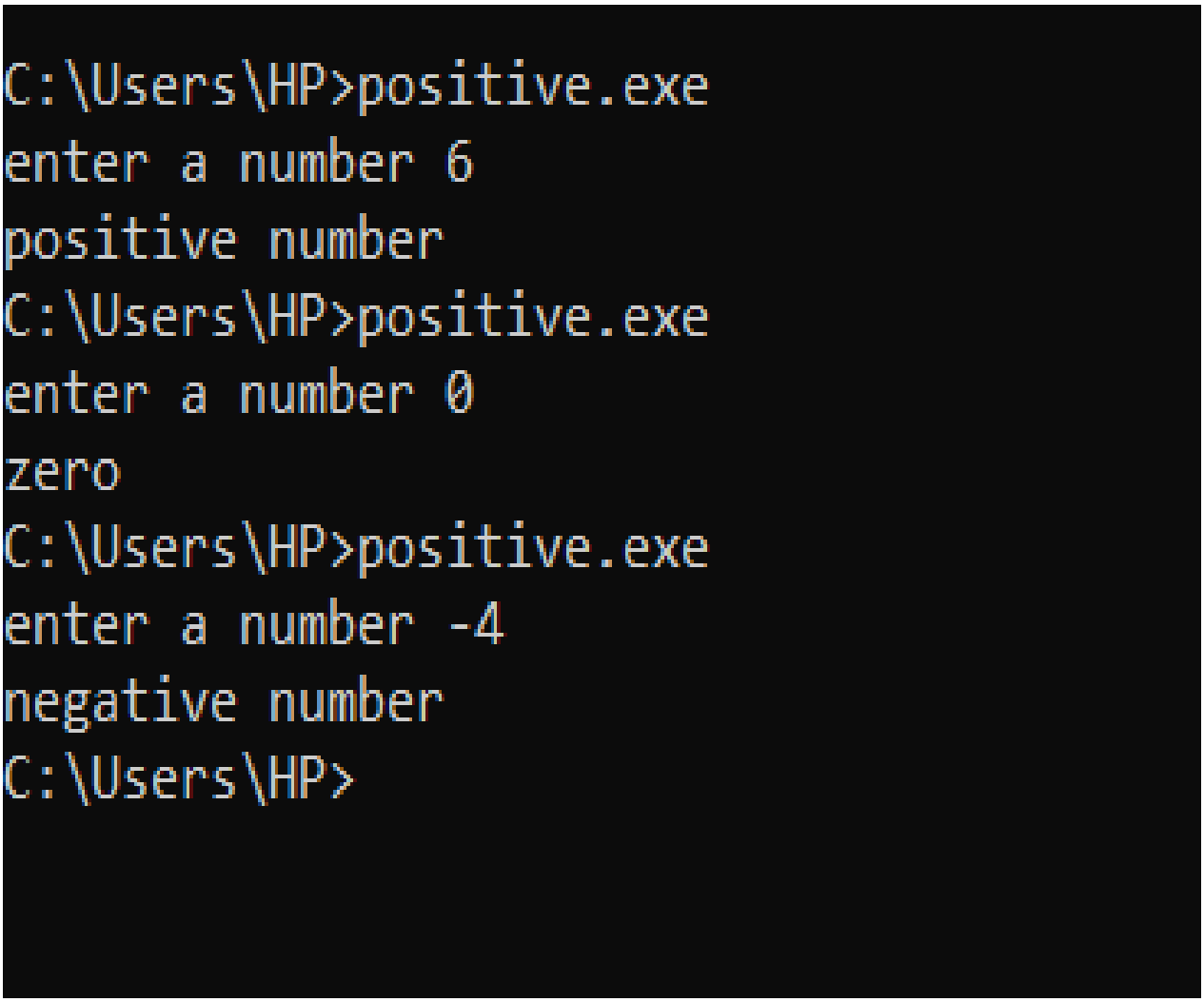

C:\Users\HP>biggest.exe
enter number 1:4
enter number 2:7
b is greatest
C:\Users\HP>biggest.exe
enter number 1:9
enter number 2:5
a is greatest
C:\Users\HP>

QUESTION 6:

Use the ternary operator to check if a number is positive, negative, or zero.

```c
#include <stdio.h>

int main() {
    int number;
    printf("enter a number ");
    scanf("%d",&number);
    number>0? printf("positive number"):number<0?printf("negative number"):printf("zero");

    return 0;
}
```

OUTPUT:

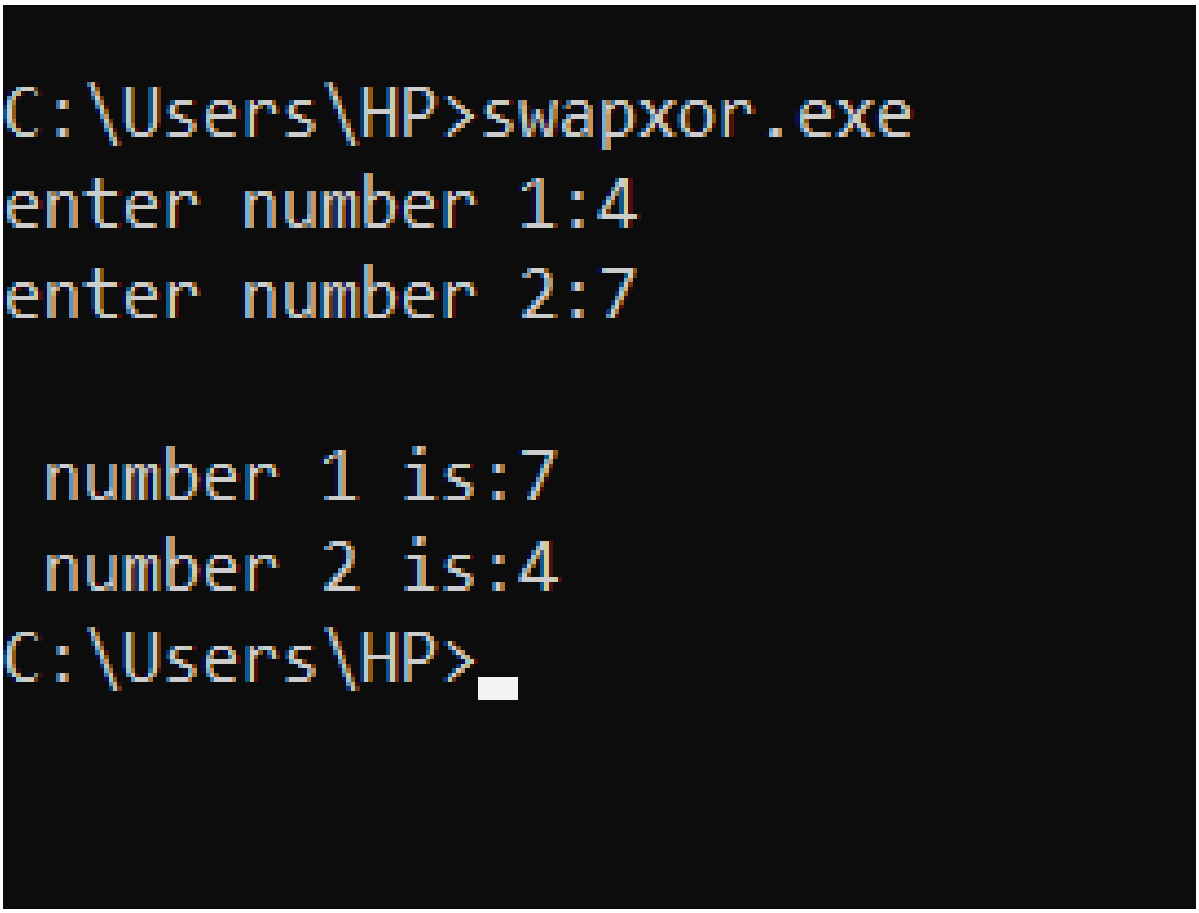

C:\Users\HP>positive.exe
enter a number 6
positive number
C:\Users\HP>positive.exe
enter a number 0
zero
C:\Users\HP>positive.exe
enter a number -4
negative number
C:\Users\HP>

QUESTION 7:

Write a program to swap two numbers using bitwise XOR.

```c
#include <stdio.h>

int main()
{
    int a,b;
    printf("enter number 1:"); // number 1=4,in bits form=100
    scanf("%d",&a);
    printf("enter number 2:"); // number 2=7 ,in bits form=111
    scanf("%d",&b);

    a=a^b; // a=011
    b=a^b; //b=100
    a=a^b; //a=100

    printf("\n number 1 is:%d",a);
    printf("\n number 2 is:%d",b);

    return 0;
}
```

OUTPUT:


C:\Users\HP>swapxor.exe
enter number 1:4
enter number 2:7
number 1 is:7
number 2 is:4
C:\Users\HP>

QUESTION 8:

Write a program that checks if a year is a leap year using the modulus operator.

```c
#include<stdio.h>
int main(){
    int year;
    printf("enter year");
    scanf("%d",&year);

    if(year%4==0&&year%100!=0||year%400==0){
        printf("it is a leap year");
    }
    else{
        printf("it is not a leap year");

    }
    return 0;
}
```

OUTPUT:

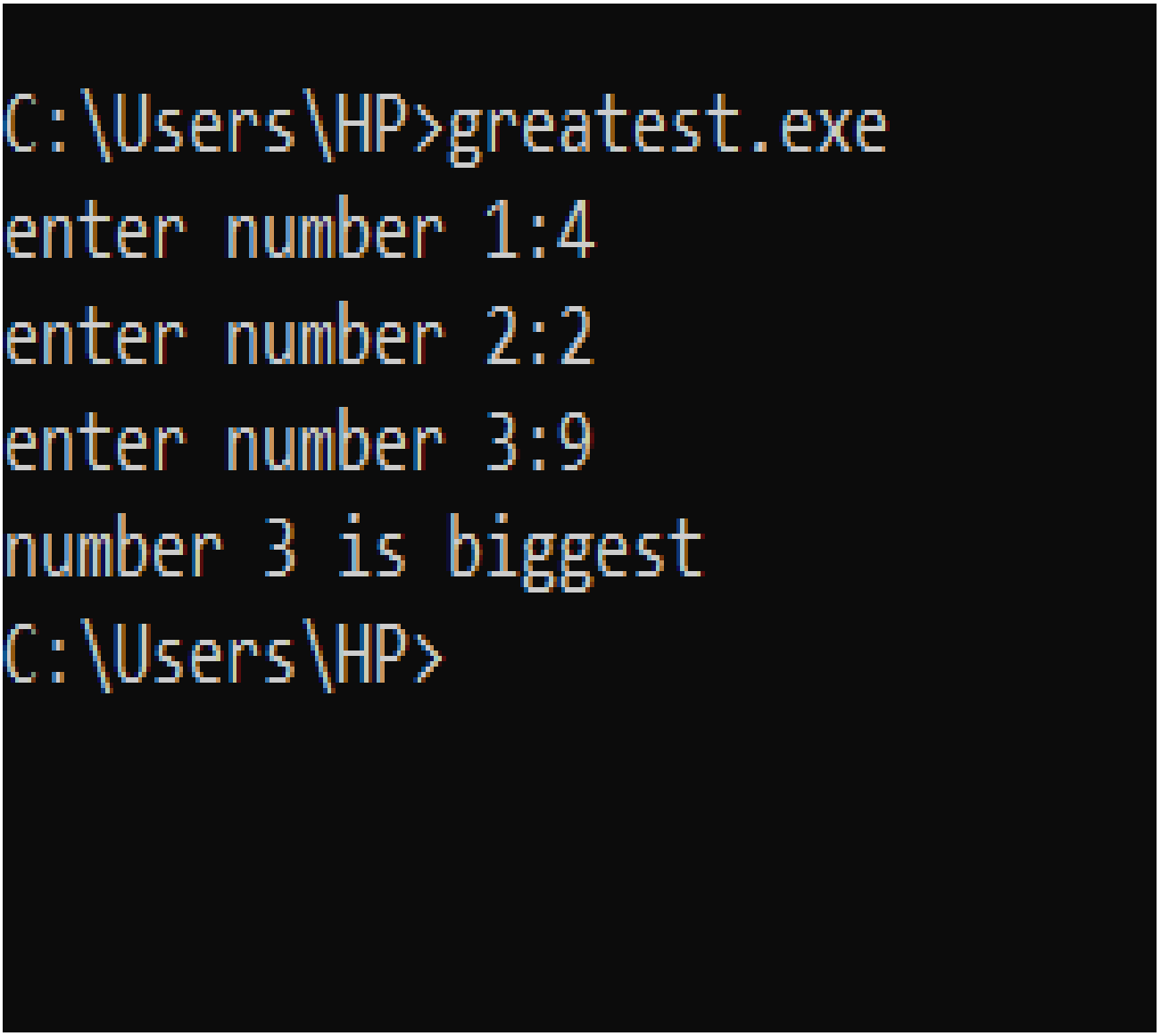
```
C:\Users\HP>leapyear.exe
enter year2024
it is a leap year
C:\Users\HP>leapyear.exe
enter year2000
it is a leap year
C:\Users\HP>leapyear.exe
enter year1900
it is not a leap year
C:\Users\HP>
```

QUESTION 9:

Write a program to find the greatest of three numbers using nested if-else statements.

```c
#include<stdio.h>
int main(){
int a,b,c;
printf("enter number 1:");
scanf("%d",&a);
printf("enter number 2:");
scanf("%d",&b);
printf("enter number 3:");
scanf("%d",&c);

if(a>b){
    if(a>c)
    {
        printf("number 1 is biggest");
    }
    else
    {
        printf("number 3 is biggest");
    }
}
else if(b>c)
{
    printf("number 2 is biggest");
}
else
{
    printf("number 3 is biggest");
}
return 0;
}
```

OUTPUT:

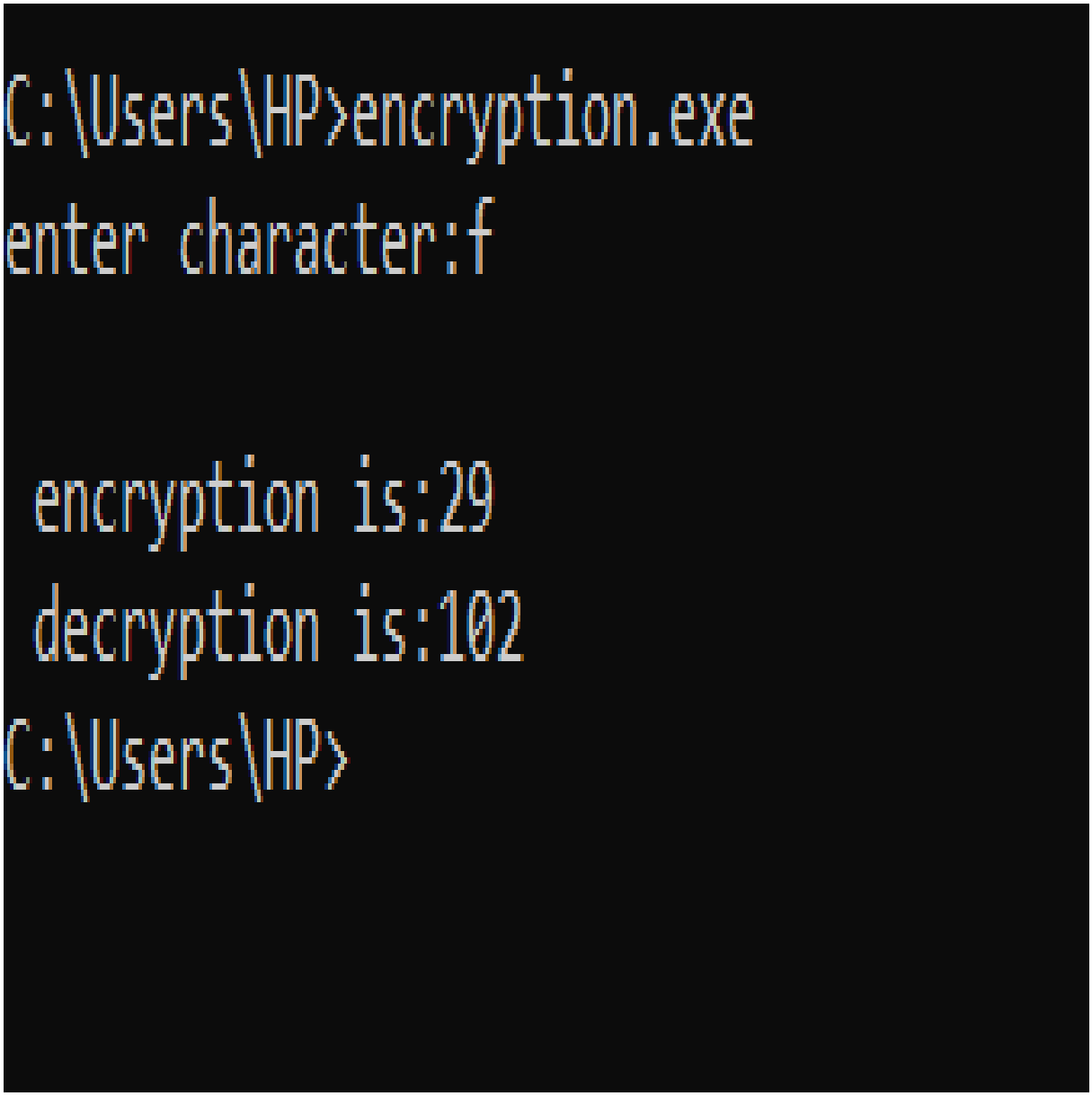

C:\Users\HP>greatest.exe
enter number 1:4
enter number 2:2
enter number 3:9
number 3 is biggest
C:\Users\HP>

QUESTION 10:

Write a program that uses bitwise operators to perform encryption and decryption of a character.

```c
#include <stdio.h>

int main()
{
    int key=123,encryption,decryption;
    char ch;
    printf("enter character:"); //character=f,in ascii=102,in bits=1100110
                                //key in bits==1111011
     scanf(" %c",&ch);

    encryption=ch^key;          // in bits=11101,in decimal=29
    decryption=encryption^key; //in bits=1100110,in decimal=102

    printf("\n encryption is:%d",encryption);
    printf("\n decryption is:%d",decryption);

    return 0;
}
```

OUTPUT:

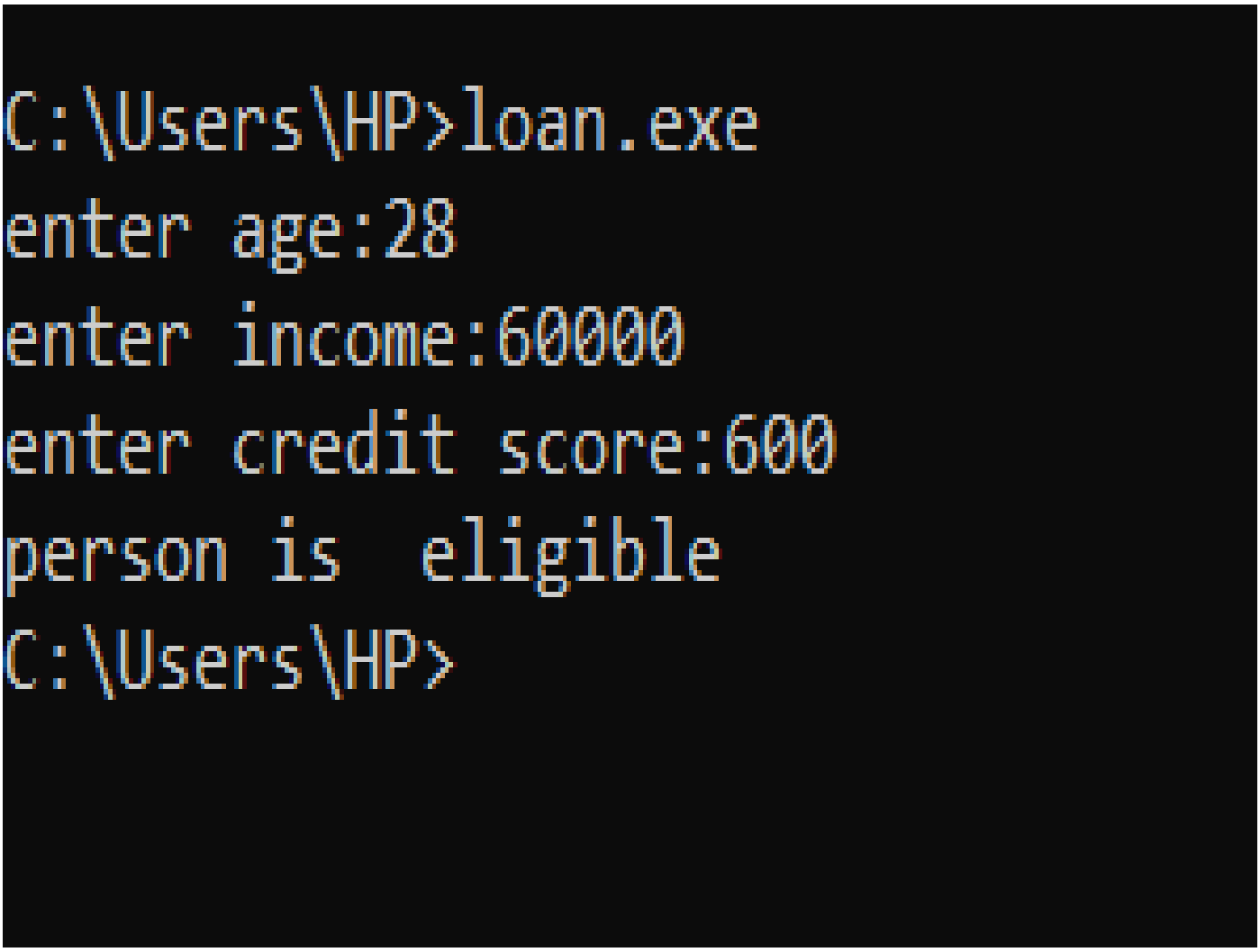

C:\Users\HP>encryption.exe
enter character:f
encryption is:29
decryption is:102
C:\Users\HP>

QUESTION 11:

Develop a program that uses logical operators to determine if a person is eligible for a loan based on age, income, and credit score.

```c
#include <stdio.h>

int main() {
  int age,income,creditscore;
  printf("enter age:");
  scanf("%d",&age);
  printf("enter income:");
  scanf("%d",&income);
  printf("enter credit score:");
  scanf("%d",&creditscore);
  if(age>=25 && income>=50000 && creditscore>=560)
  {
      printf("person is  eligible");
  }

  else
  {
      printf("person is not eligible");
  }

    return 0;
}
```

OUTPUT:


C:\Users\HP>loan.exe
enter age:28
enter income:60000
enter credit score:600
person is eligible
C:\Users\HP>

QUESTION 12:

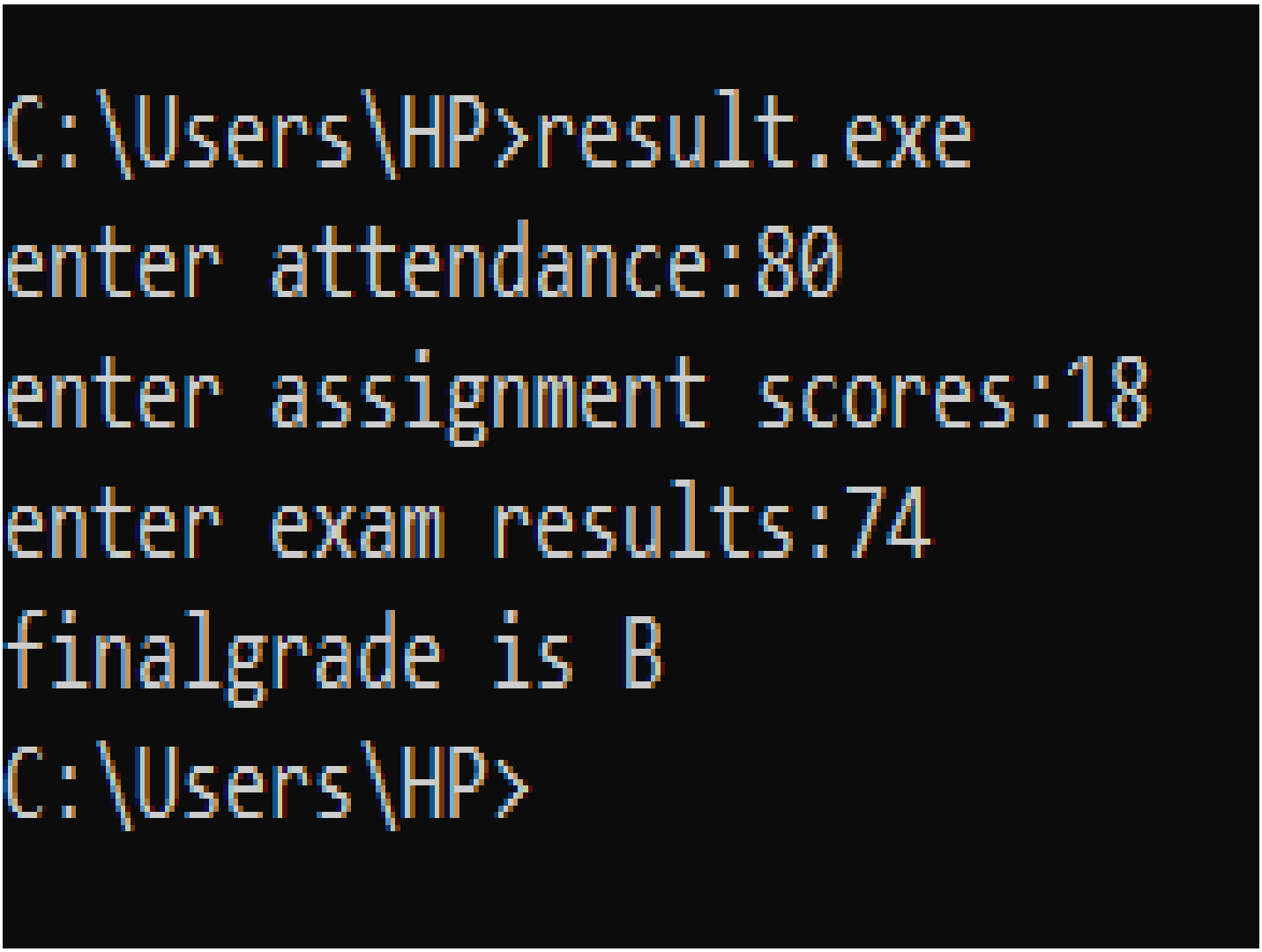
Create a program that calculates the final grade of a student based on multiple criteria, including attendance, assignment scores, and exam results, using nested decision structures.

```c
#include <stdio.h>

int main() {
int attendance,assignmentscores,examresults;

printf("enter attendance:");
scanf("%d",&attendance);
if(attendance<75)
{
    printf("finalgrade is FAIL");
    return 0;
}
printf("enter assignment scores:");
scanf("%d",&assignmentscores);

printf("enter exam results:");
scanf("%d",&examresults);

if(assignmentscores>=15)
{
    if(examresults>=80)
    {
        printf("finalgrade is A");
    }
    else if(examresults>=70)
    {
        printf("finalgrade is B");
    }
```

```
29      else if(examresults>=60)
30      {
31          printf("finalgrade is C");
32      }
33      else if(examresults>=50)
34      {
35         printf("finalgrade is D");
36      }
37      else
38      {
39        printf("finalgrade is FAIL");
40      }
41  }
42  else if(assignmentscores>=10)
43  {
44      if(examresults>=85)
45      {
46          printf("finalgrade is A");
47      }
48      else if(examresults>=77)
49      {
50           printf("finalgrade is B");
51      }
52      else if(examresults>=70)
53      {
54          printf("finalgrade is C");
55      }
56      else if(examresults>=65)
57      {
58          printf("finalgrade is D");
59      }
60      else
61      {
62        printf("finalgrade is FAIL");
63      }
64  }
65  else if(assignmentscores>=5)
66  {
67      if(examresults>=93)
68      {
69          printf("finalgrade is A");
70      }
```

```
    else if(examresults>=86)
    {
        printf("finalgrade is B");
    }
    else if(examresults>=80)
    {
        printf("finalgrade is C");    }
    else if(examresults>=75)
    {
       printf("finalgrade is D");
    }
    else
    {
      printf("finalgrade is FAIL");
    }
}

else
{
    printf("finalgrade is FAIL");
}

    return 0;
}
```

OUTPUT:


C:\Users\HP>result.exe
enter attendance:80
enter assignment scores:18
enter exam results:74
finalgrade is B
C:\Users\HP>