

**(1)** Write a program that take two integers from the user and print the results of this equation:

$$\text{Result} = ((\text{num1} + \text{num2}) * 3) - 10$$

```
*main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int number1, number2, result;
7      printf("please enter two numbers : "); //2 3
8      scanf("%d %d", &number1, &number2);
9      result = (float) ((number1 + number2) * 3) - 10; //result = 5
10     printf("_____ \n");
11     printf("the result of ((%d+%d)*3)-10 = %d", number1, number2, result);
12
13
14     return 0;
15 }
16
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT1\bin\Debug\assignmentOnePT1.exe"
please enter two numbers : 2 3
the result of ((2+3)*3)-10 = 5
Process returned 0 (0x0)   execution time : 1.102 s
Press any key to continue.
```

**2)** Write a program that print your name and your grade in a new line.

```
main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      printf("\n my name is : Nouran Tarek \n and my grade is : 3.29 ");
7
8      return 0;
9  }
10
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT2\bin\Debug\assignmentOnePT2.exe"
my name is : Nouran Tarek
and my grade is : 3.29
Process returned 0 (0x0)   execution time : 0.045 s
Press any key to continue.
```

**(3)** Write a program for converting temperature from degrees Celsius to degrees Fahrenheit, given the formula :  $F = C \times \frac{9}{5} + 32$

```
main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      //F = C x 9/5 + 32
7      float degreeInCelsius, degreeInFahrenheit;
8      printf("please enter the degree in Celsius \n");
9      scanf("%f", &degreeInCelsius);
10     degreeInFahrenheit = degreeInCelsius * 9 / 5 + 32;
11     printf("\n");
12     printf("%f in Fahrenheit is %f \n", degreeInCelsius, degreeInFahrenheit);
13     printf("\n");
14     return 0;
15 }
```

"D:\ITI 2023\_2024\C Programming\Assignments\assignmentOnePT3\bin\Debug\assignmentOnePT3.exe" — □ ×

```
please enter the degree in Celsius
22.5

22.500000 in Fahrenheit is 72.500000

Process returned 0 (0x0)   execution time : 1.338 s
Press any key to continue.
```

**(4)** Write a program that reads the radius of a circle and calculates the area and circumference then prints the results.

```
*main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <math.h>
4  int main()
5  {
6      double radius, area, circumference;
7      printf("please enter the radius of the circle \n");
8      scanf("%lf", &radius);
9      area = M_PI * radius * radius;
10     circumference = 2 * M_PI * radius;
11     printf("\n");
12     printf("area of a circle with a %lf radius is %lf \n", radius, area);
13     printf("circumference of a circle with a %lf radius is %lf \n", radius, circumference);
14     printf("\n");
15     return 0;
16 }
17
```

"D:\ITI 2023\_2024\C Programming\Assignments\assignmentOnePT4\bin\Debug\assignmentOnePT4.exe" — □ ×

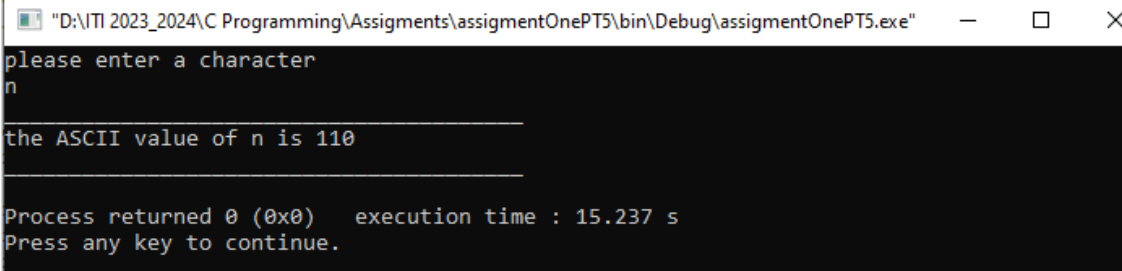
```
please enter the radius of the circle
3

area of a circle with a 3.000000 radius is 28.274334
circumference of a circle with a 3.000000 radius is 18.849556

Process returned 0 (0x0)   execution time : 0.423 s
Press any key to continue.
```

(5) Write a program to print the ASCII value of a character input by the user.

```
*main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      char character;
7      printf("please enter a character \n");
8      scanf(" %c",&character);
9      printf("_____\n");
10     printf("the ASCII value of %c is %d \n",character,character);
11     printf("_____\n");
12
13
14     return 0;
15 }
16
```



```
"D:\ITI 2023_2024\C Programming\Assigments\assignmentOnePT5\bin\Debug\assignmentOnePT5.exe"
please enter a character
n
the ASCII value of n is 110

Process returned 0 (0x0)   execution time : 15.237 s
Press any key to continue.
```

(6) Write a program that print the relation between two integer number if those numbers are equal, not equal and which one contain the higher value.

```
*main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int number1 , number2;
7      printf("please enter two integer numbers to know the relation between them : \n");
8      scanf("%d %d",&number1,&number2);
9      if(number1!=number2){
10         if(number1>number2){
11             printf("_____\n");
12             printf("%d and %d are not equal and %d is higher than %d \n",number1,number2,number1,number2);
13             printf("_____\n");
14         }
15         else {
16             printf("_____\n");
17             printf("%d and %d are not equal and %d is higher than %d \n",number1,number2,number2,number1);
18             printf("_____\n");
19         }
20     }
21     else{
22         printf("_____\n");
23         printf("%d and %d are equal \n",number1,number2);
24         printf("_____\n");
25     }
26
27     return 0;
28 }
29
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT6\bin\Debug\assignmentOnePT6.exe"
please enter two integer numbers to know the relation between them :
7 7
7 and 7 are equal
Process returned 0 (0x0)   execution time : 5.931 s
Press any key to continue.
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT6\bin\Debug\assig...
please enter two integer numbers to know the relation between them :
3 5
3 and 5 are not equal and 5 is higher than 3
Process returned 0 (0x0)   execution time : 2.412 s
Press any key to continue.
```

(7) Write a program that takes three integers, and prints out the smallest number.

```
main.c X main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int number1,number2,number3;
7      printf("please enter three integer numbers to know the relation between them : \n");
8      scanf("%d %d %d",&number1,&number2,&number3);
9      if (number1<=number2&&number1<=number3){
10         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number1);
11         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number1);
12         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number1);
13     }
14     else if (number2<=number1&&number2<=number3){
15         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number2);
16         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number2);
17         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number2);
18     }
19     else{
20         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number3);
21         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number3);
22         printf("the smallest number among %d %d %d is %d \n",number1,number2,number3,number3);
23     }
24     return 0;
25 }
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT7\bin\Debug\assignmentOnePT7.exe"
please enter three integer numbers to know the relation between them :
4 4 7
the smallest number among 4 4 7 is 4
Process returned 0 (0x0)   execution time : 6.418 s
Press any key to continue.
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT7\bin\Debug\assignmentOnePT7.exe"
please enter three integer numbers to know the relation between them :
1 2 3
the smallest number among 1 2 3 is 1
Process returned 0 (0x0)   execution time : 3.004 s
Press any key to continue.
```

**(8)** Write a program that reads a positive integer and checks if it is a perfect square.

The image shows a C program in a text editor and its execution in a console window. The program checks if a given number is a perfect square by iterating from 1 to the number and checking if any square equals the number. The console shows two runs: one for the input 9, which is correctly identified as a perfect square, and one for the input 3, which is correctly identified as not a perfect square.

```
*main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int number ,i,isPerfect=0;
7      printf("please enter a positive number to check : \n");
8      scanf("%d",&number);
9
10     if (number<1){
11         printf("sorry this is not a positive number try again .. : \n");
12     }
13     else {
14         for (i=1;i*i<=number;i++){
15             if (i*i==number){
16                 isPerfect=1;
17             }
18         }
19         if (isPerfect){
20             printf("_____ \n");
21             printf("%d is is a perfect square\n",number);
22         }
23         else {
24             printf("_____ \n");
25             printf("unfortunately %d is not a perfect square\n",number);
26         }
27     }
28     return 0;
29 }
30
31
```

"D:\ITI 2023\_2024\C Programming\Assignments\assignmentOnePt8\bin\Debug\assignmentOnePt8.exe" — □ ×

```
please enter a positive number to check :
9
_____
9 is is a perfect square
Process returned 0 (0x0)   execution time : 0.572 s
Press any key to continue.
```

"D:\ITI 2023\_2024\C Programming\Assignments\assignmentOnePt8\bin\Debug\assignmentOnePt8.exe"

```
please enter a positive number to check :
3
_____
unfortunately 3 is not a perfect square
Process returned 0 (0x0)   execution time : 0.643 s
Press any key to continue.
```

**(9)** Write a program that reads a student grade percentage and prints "Excellent" if his grade is greater than or equal 85, "Very Good" for 75 or greater; "Good" for 65, "Pass" for 50, "Fail" for less than 50.

```
main.c X
4   int main()
5   {
6       int grade;
7
8       printf("Enter the student's grade percentage: ");
9       scanf("%d", &grade);
10      if (grade == 50) {
11          printf("Pass\n");
12      } else if (grade >= 65 && grade < 75) {
13          printf("Good\n");
14      } else if (grade >= 75 && grade < 85) {
15          printf("Very Good\n");
16      } else if (grade >= 85) {
17          printf("Excellent\n");
18      } else {
19          printf("Fail\n");
20      }
21
22      return 0;
23  }
24
```

```
"D:\ITI 2023_2024\C Programming\Assigments\assignmentOnePT9\bin\Debug\assi...
Enter the student's grade percentage: 84
Very Good

Process returned 0 (0x0)   execution time : 4.576 s
Press any key to continue.
```

(10) Write a program to make a simple calculator using switch-case. The calculator takes the operation(+ or –

```
main.c X
6   int n1, n2;
7   char operator1;
8   printf("please enter two numbers : \n");
9   scanf("%d %d", &n1, &n2);
10  printf("please enter an operator (+ or - or * or /) \n");
11  scanf(" %c", &operator1);
12  switch(operator1) {
13      case '+':
14          printf("the addition of %d and %d is %d", n1, n2, n1+n2);
15          break;
16      case '-':
17          printf("the subtraction of %d and %d is %d", n1, n2, n1-n2);
18          break;
19      case '*':
20          printf("the multiplication of %d and %d is %d", n1, n2, n1*n2);
21          break;
22      case '/':
23          if (n2 == 0) {
24              printf("the division of %d and %d is not valid", n1, n2);
25          }
26          else {
27              printf("the divition of %d and %d is %d", n1, n2, (float)n1/n2);
28          }
29          break;
30      default:
31          printf("please try to put valid operator :) ");
32  }
33  return 0;
34  }
35  }
36
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT10\bin\Debug\assignmentOnePT10.exe"
please enter two numbers :
3
0
please enter an operator (+ or - or * or /)
/
the division of 3 and 0 is not valid
Process returned 0 (0x0)   execution time : 6.779 s
Press any key to continue.

"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT10\bin\Debug\assignmentOnePT10.exe"
please enter two numbers :
4 6
please enter an operator (+ or - or * or /)
+
the addition of 4 and 6 is 10
Process returned 0 (0x0)   execution time : 4.133 s
Press any key to continue.
```

## (11)Print sum of first 100 integers. (With data validation)

```
main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int number,sum = 0;
7      printf("please enter the number 100 to sum the first 100 integer: \n");
8      scanf("%d", &number);
9
10     if (number!=100) {
11         printf("Please enter a valid number 100 for this program.\n");
12     } else{
13         for (int i = 1; i <= number; i++) {
14             sum += i;
15         }
16
17         printf("The sum of the first %d integers is: %d\n", number, sum);
18     }
19
20     return 0;
21 }
22
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT11\bin\Debug\assignmentOnePT11.exe"
please enter the number 100 to sum the first 100 integer:
100
The sum of the first 100 integers is: 5050
Process returned 0 (0x0)   execution time : 5.353 s
Press any key to continue.

"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT11\bin\Debug\assignmentOnePT11.exe"
please enter the number 100 to sum the first 100 integer:
20
Please enter a valid number 100 for this program.
Process returned 0 (0x0)   execution time : 12.568 s
Press any key to continue.
```

(12) Write a program that reads a positive integer and computes the factorial.

The image shows a C program in a text editor and its execution in a console window. The program, named \*main.c, includes `<stdio.h>` and `<stdlib.h>`. It defines a `main()` function that prompts the user for a positive integer. If the input is greater than 0, it calculates the factorial using a `for` loop and prints the result. If the input is not positive, it prints an error message. The console window shows two runs: the first with input -3 resulting in an error message, and the second with input 5 resulting in the output "the factorial of 5 is 120".

```
*main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int number, i;
7      unsigned int factorial=1;
8      printf("please enter positive number: \n");
9      scanf("%d", &number);
10     if (number > 0){
11         for(i=1; i<=number; i++){
12             factorial*=i;
13         }
14         printf("the factorial of %d is %u: \n", number, factorial);
15     }
16     else {
17         printf("this is not positive number please try to enter positive number: \n");
18     }
19     return 0;
20 }
```

"D:\ITI 2023\_2024\C Programming\Assignments\assignmentOnePT12\bin\Debug\assignmentOnePT12.exe" — □ ×

```
please enter positive number:
-3
this is not positive number please try to enter positive number:

Process returned 0 (0x0)   execution time : 1.803 s
Press any key to continue.
```

"D:\ITI 2023\_2024\C Programming\Assignments\assignmentOnePT12\bin\Debug\assignmentOnePT12.exe" — □ ×

```
please enter positive number:
5
the factorial of 5 is 120:

Process returned 0 (0x0)   execution time : 0.515 s
Press any key to continue.
```

(13) Write a program that reads a positive integer and checks if it is a prime.

The image shows a C program in a text editor. The program, named main.c, includes `<stdio.h>` and `<stdlib.h>`. It defines a `main()` function that prompts the user for a number. If the input is less than or equal to 1, it prints a message asking for a positive integer greater than 1. Otherwise, it checks for primality by testing divisibility from 2 to the number. If a divisor is found, it prints that the number is not prime. If no divisor is found, it prints that the number is prime. The program then prompts the user to try again.

```
main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main() {
5      int number, i;
6      int isPrime = 1;
7      printf("Please enter a number: \n");
8      scanf("%d", &number);
9      if (number <= 1) {
10         printf("This is not a prime number. Please enter a positive integer greater than 1.\n");
11     } else {
12         for (i=2; i*i<= number; i++) {
13             if (number%i== 0) {
14                 isPrime=0;
15                 break;
16             }
17         }
18         if (isPrime) {
19             printf("%d is a prime number.\n", number);
20         } else {
21             printf("%d is not a prime number. Please try to enter a prime number.\n", number);
22         }
23     }
24     return 0;
25 }
```



```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT13\bin\Debug\assignmentOnePT13.exe"
Please enter a number:
4
4 is not a prime number. Please try to enter a prime number.

Process returned 0 (0x0)   execution time : 2.944 s
Press any key to continue.

"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT13\bin\Debug\assignmentOnePT13.exe"
Please enter a number:
2
2 is a prime number.

Process returned 0 (0x0)   execution time : 1.958 s
Press any key to continue.
```

(14) Write a program to display English alphabets from A to Z.

```
main.c X main.c X main.c X
1      #include <stdio.h>
2      #include <stdlib.h>
3
4      int main()
5      {
6          char character;
7          for(character='A';character<='Z';character++){
8              printf("%c \t",character);
9          }
10
11         return 0;
12     }
13

"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT14\bin\Debug\assignmentOnePT14.exe"
A      B      C      D      E      F      G      H      I      J      K      L      M
N      O      P      Q      R      S      T      U      V      W      X      Y      Z

Process returned 0 (0x0)   execution time : 0.011 s
Press any key to continue.
```

(15) Write a program to calculate the power of a number. The number and its power are input from user.

```
*main.c X
1      #include <stdio.h>
2      #include <stdlib.h>
3      #include <math.h>
4
5      int main()
6      {
7          int number ,power,result;
8          printf("please enter the number and its power : \n");
9          scanf("%d %d",&number,&power);
10         if(power==0){
11             printf("%d power %d = 1 \n",number,power);
12         }
13         else {
14             result =pow(number,power);
15             printf("%d power %d = %d \n",number,power,result);
16         }
17         return 0;
18     }
19
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT15\bin\Debug\assignmentOnePT15.exe"
please enter the number and its power :
3
4
3 power 4 = 81

Process returned 0 (0x0)   execution time : 5.995 s
Press any key to continue.
```

**(16)** Write a program to reverse a number.

```
main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6
7      int number,reversedNumber=0,remainder;
8      printf("please enter a number: ");
9      scanf("%d",&number);
10     while (number!=0){
11         remainder=number%10;
12         reversedNumber = reversedNumber * 10 + remainder;
13         number /= 10;
14     }
15     printf("number after reverse is %d",reversedNumber);
16     return 0;
17 }
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT16\bin\Debug\assignmentOnePT16.exe"
please enter a number: 156
number after reverse is 651
Process returned 0 (0x0)   execution time : 5.730 s
Press any key to continue.
```

**17)** Write a program to count number of digits in a decimal number.

```
main.c X main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6
7      int number,count=0;
8      printf("please enter a number: ");
9      scanf("%d",&number);
10     while (number!=0){
11         number /= 10;
12         count++;
13     }
14     printf("number digits are is %d",count);
15     return 0;
16 }
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT17\bin\Debug\assignmentOnePT17.exe"
please enter a number: 245
number digits are is 3
Process returned 0 (0x0)   execution time : 2.650 s
Press any key to continue.
```

**(18)** Write a program to display half pyramid using stars pattern.

```
main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int i ,j ,rows;
7      printf("please enter the number of rows you want to build pyramids with \n");
8      scanf("%d",&rows);
9      for(i=1;i<=rows;i++){
10         for(j=1;j<=i;j++){
11             printf("*");
12         }
13         printf("\n");
14     }
15     return 0;
16 }
17
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT18\bin\Debug\assignmentOnePT18.exe"
please enter the number of rows you want to build pyramids with
5
*
**
***
****
*****

Process returned 0 (0x0)   execution time : 1.274 s
Press any key to continue.
```

**(19)** Write a program to display inverted half pyramid using stars pattern.

```
main.c X main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int i ,j ,rows;
7      printf("please enter the number of rows you want to build pyramids with \n");
8      scanf("%d",&rows);
9      for(i=rows;i>=1;i--){
10         for(j=1;j<=i;j++){
11             printf("*");
12         }
13         printf("\n");
14     }
15     return 0;
16 }
17
18
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT19\bin\Debug\assignmentOnePT19.exe"
please enter the number of rows you want to build pyramids with
5
*****
****
***
**
*

Process returned 0 (0x0)   execution time : 0.640 s
Press any key to continue.
```

(20) Write a program to display a full pyramid using stars pattern.

```
main.c x main.c x
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int i ,j ,k,rows;
7      printf("please enter the number of rows you want to build pyramids with \n");
8      scanf("%d",&rows);
9      for(i=1;i<=rows;i++){
10         for(j=1;j<=rows-i;j++){
11             printf(" ");
12         }
13         for(k=1;k<=(2*i-1);k++){
14             printf("*");
15         }
16         printf("\n");
17     }
18
19
20
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT20\bin\Debug\assignmentOnePT20.exe"
please enter the number of rows you want to build pyramids with
5
 *
 ***
*****
*****
*****

Process returned 0 (0x0)   execution time : 1.914 s
Press any key to continue.
```

**(21)** Write a program to display cross or X-shape using stars pattern.

```
main.c X
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      int row, column, totalRows;
7      printf("please enter the number of rows you want to build X-shape with \n");
8      scanf("%d", &totalRows);
9      for(row=0; row<totalRows; row++){
10         for(column=0; column<totalRows; column++){
11             if(row==column || (row+column)==(totalRows-1)){
12                 printf("*");
13             }
14             else {
15                 printf(" ");
16             }
17         }
18         printf("\n");
19     }
20
21 }
```

```
"D:\ITI 2023_2024\C Programming\Assignments\assignmentOnePT21\bin\Debug\assignmentOnePT21.exe"
please enter the number of rows you want to build X-shape with
10
*
 *
*  *
 *  *
**
**
 *  *
*  *
 *  *
*
*

Process returned 0 (0x0)   execution time : 0.935 s
Press any key to continue.
```