Homework 2 Solutions

❖ Problem 1

Numbers perfectly divisible by 2 are known even numbers and numbers which are not divisible by 2 are called odd numbers. This program takes an integer from user and checks whether that number is even or odd and displays the result.

✓ Solution

```c
#include <stdio.h>
int main() {
            int num = 0;
            printf("Enter an integer you want to check:");
            fflush(stdout);
            scanf("%d",&num);

            printf("The Number %d is %s",num,((num%2) ? "odd" : "even"));
    return 0;
}
```

Test case

```
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abdallah Ghazy\Deskto
Enter an integer you want to check:25
The Number 25 is odd
```

❖ Problem 2

Alphabets a, e, i, o and u are known as vowels and all alphabets except these characters are known as consonants. This program asks user to enter a character and checks whether that character is vowel or not.

✓ Solution

```c
#include <stdio.h>
int main() {
            char character ;
            printf("Enter an alphabet:");
            fflush(stdout);
            scanf("%c",&character);

            switch(character){
            case 'a':
            case 'e':
            case 'i':
            case 'o':
            case 'u':
            case 'A':
            case 'E':
            case 'I':
            case 'O':
            case 'U':
                  printf("%c  is a vowel.",character);
                  break;

            default:
                  printf("%c  is a consonant.",character);
            }
    return 0;
}
```

Test case

```
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abda
Enter an alphabet:i
i  is a vowel.
```

```
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\
Enter an alphabet:I
I  is a vowel.
```

❖ Problem 3

C Program to Find the Largest Number Among Three Numbers

In this program user is asked to enter three numbers and this program will find the largest number among three numbers entered by user. This program can be solved in more than one way.

✓ Solution

```c
#include <stdio.h>
int main() {
          float num1 ;
          float num2 ;
          float num3 ;
          printf("Enter three numbers...\n");

          printf("The Number 1: ");
          fflush(stdout);
          scanf("%f",&num1);

          printf("The Number 2: ");
          fflush(stdout);
          scanf("%f",&num2);

          printf("The Number 3: ");
          fflush(stdout);
          scanf("%f",&num3);

          if(num1>num2 && num1>num3)
                printf("Largest number = %.3f",num1);

          else if(num2>num1 && num2>num3)
                printf("Largest number = %.3f",num2);

          else
                printf("Largest number = %.3f",num3);

    return 0;
}
```

Test case

```
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abdallah Ghazy\Desktop\New folder (2)\text\Debug\text.exe (6/29/24
Enter three numbers...
The Number 1: 12.2
The Number 2: 13.452
The Number 3: 10.193
Largest number = 13.452000
```

❖ Problem 4

C Program to Check Whether a Number is Positive or Negative

This program takes a number from user and checks whether that number is either positive or negative or zero.

✓ Solution

```c
#include <stdio.h>
int main() {
      float num = 0.0;

     printf("Enter a number:");
     fflush(stdout);
     scanf("%f",&num);

     if(num > 0.0)
          printf("%.2f is positive.",num);

     else if(num < 0.0)
          printf("%.2f is negative.",num);

     else
          printf("You entered zero.");

    return 0;
}
```

Test case

```
Enter a number:12.3
12.30 is positive.
```

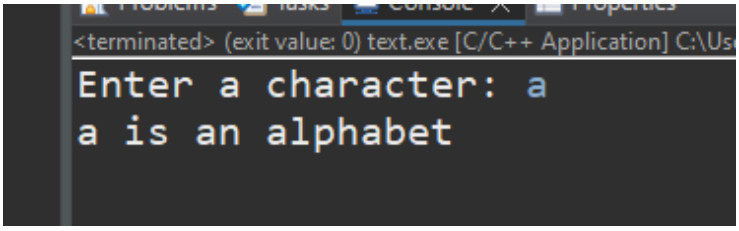
❖ Problem 5

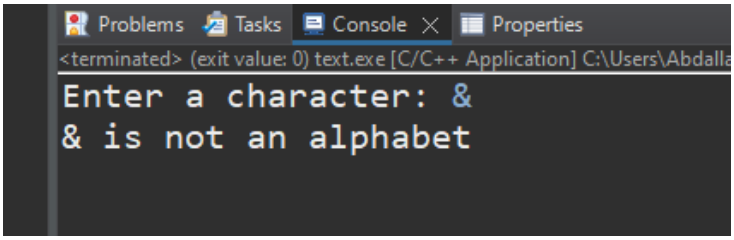
C Program to Check Whether a Character is an Alphabet or not

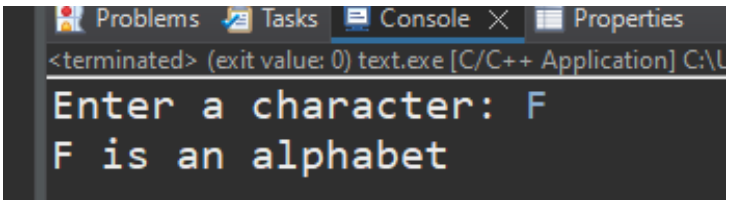
This program takes a character from user and checks whether that character is an alphabet or not.

✓ Solution

```c
#include <stdio.h>

int main() {
    char Character = 0;
    printf("Enter a character: ");

    fflush(stdout);
    scanf("%c", &Character);

    if ((Character >= 'a' && Character <= 'z') || (Character >= 'A' && Character <= 'Z'))
{
        printf("%c is an alphabet\n", Character);
    } else {
        printf("%c is not an alphabet\n", Character);
    }

    return 0;
}
```







Test case

❖ Problem 6

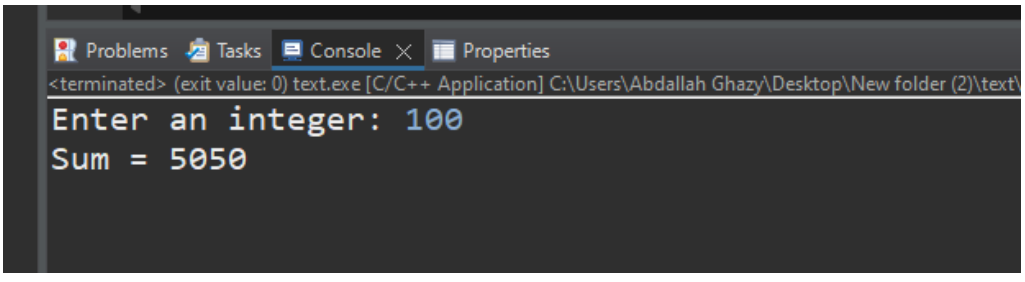
C Program to Calculate Sum of Natural Numbers

Positive integers 1, 2, 3, 4 ... are known as natural numbers. This program takes a positive integer from user (suppose user entered n) then, this program displays the value of 1+2+3+ .... n.

✓ Solution

```c
#include <stdio.h>

int main() {
    int number = 0;
    int sum=0;
    printf("Enter an integer: ");

    fflush(stdout);
    scanf("%d", &number);

    for(int i = 1 ; i <= number ; i++){
     sum += i;
    }

    printf("Sum = %d",sum);

    return 0;
}
```

Test case



❖ Problem 7

C Program to Find Factorial of a Number

For any positive number n, its factorial is given by:

- factorial = 1*2*3*4 .... n
- If a number is negative, factorial does not exist and factorial of 0 is 1.

This program takes an integer from a user. If user enters negative integer, this program will display error message and if user enters non-negative integer, this program will display the factorial of that number.

✓ Solution

```c
#include <stdio.h>

int main() {
    int number = 0;
    int factorial = 1;
    printf("Enter an integer: ");

    fflush(stdout);
    scanf("%d", &number);

    if (number > 0) {
        for(int i = 1; i <= number; i++) {
            factorial *= i;
        }
        printf("Factorial = %d\n", factorial);
    } else if (number == 0) {
        printf("Factorial = 1\n");
    } else if (number < 0) {
        printf("Error!!! Factorial of negative number doesn't exist.\n");
    } else {
        printf("Please enter a number.\n");
    }

    return 0;
}
```

<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abdallah

```
Enter an integer: 10
factorial  = 3628800
```

Test case

Problems Tasks Console Properties

<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abdallah Ghazy\Desktop\New folder (2)\text\Debug\text.exe (6/29/24, 7:49 PM)

```
Enter an integer: -5
Error !!! Factorial of negative number doesn't exist.
```

❖ Problem 8

C Program to Make a Simple Calculator to Add, Subtract, Multiply or Divide Using switch ... case

This program takes an arithmetic operator (+,-, *, /) and two operands from an user and performs the operation on those two operands depending upon the operator entered by user.

```c
#include <stdio.h>

int main() {
      float num1 = 0;
      float num2 = 0;
      char operator=0;

      printf("Enter operator either + or - or * or divide :");
      fflush(stdout);
      scanf(" %c",&operator);

      switch(operator){
      case '+':
            printf("Enter two operands \" A + B \": ");
            fflush(stdout);
            scanf("%f + %f",&num1,&num2);
            printf("%f + %f = %f",num1,num2,(num1+num2));
            break;

      case '-':
            printf("Enter two operands \" A - B \": ");
            fflush(stdout);
            scanf("%f - %f",&num1,&num2);
            printf("%f - %f = %f",num1,num2,(num1-num2));
            break;

      case '*':
            printf("Enter two operands \" A * B \": ");
            fflush(stdout);
            scanf("%f * %f",&num1,&num2);
            printf("%f * %f = %f",num1,num2,(num1*num2));
            break;

      case '/':
            printf("Enter two operands \" A / B \": ");
            fflush(stdout);
            scanf("%f / %f",&num1,&num2);
            printf("%f / %f = %f",num1,num2,(num1/num2));
            break;

    default:
        printf("Invalid operator!\n");
        break;

      }

}
```

```
Enter operator either + or - or * or divide :+
Enter two operands " A + B ": 2 + 0
2 + 0 = 2
```

```
Enter operator either + or - or * or divide :-
Enter two operands " A - B ": 2-2
2 - 2 = 0
```

```
Enter operator either + or - or * or divide :*
Enter two operands " A * B ": 2*0
2 * 0 = 0
```

```
Enter operator either + or - or * or divide :/
Enter two operands " A / B ": 5/2
5.000000 / 2.000000 = 2.500000
```

Test case