

# ADVANCED CODING 2

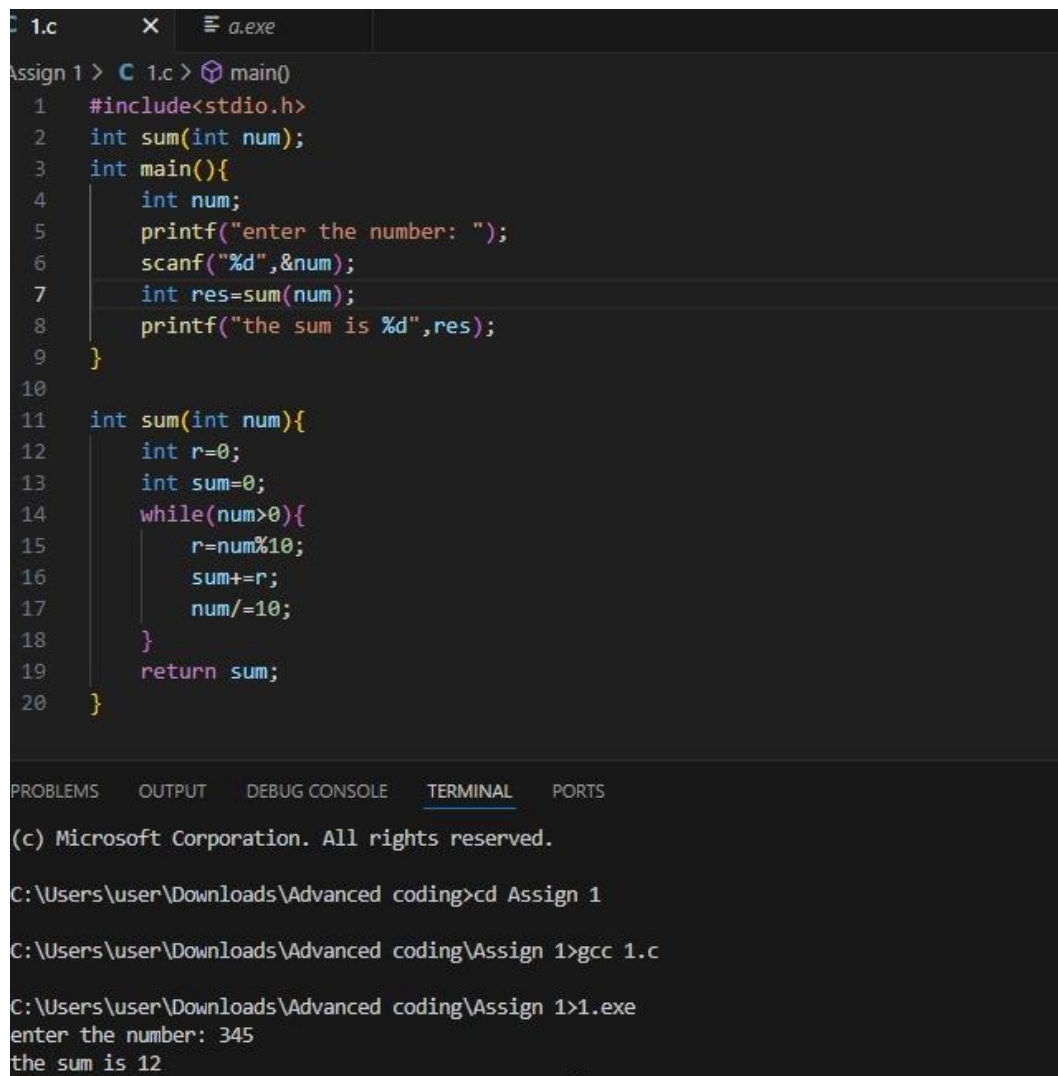
## Assignment 1

K. SRIKAR

VU21CSEN0300058

1) Write a C program to calculate sum of digits of a number.

Code and Output:



The image shows a screenshot of a code editor and a terminal window. The code editor displays a C program to calculate the sum of digits of a number. The program includes `<stdio.h>`, defines a `sum` function, and uses `printf` and `scanf` in the `main` function. The terminal window shows the execution of the program, where the user enters the number 345 and the program outputs the sum 12.

```
1.c x a.exe
Assign 1 > C 1.c > main()
1  #include<stdio.h>
2  int sum(int num);
3  int main(){
4      int num;
5      printf("enter the number: ");
6      scanf("%d",&num);
7      int res=sum(num);
8      printf("the sum is %d",res);
9  }
10
11 int sum(int num){
12     int r=0;
13     int sum=0;
14     while(num>0){
15         r=num%10;
16         sum+=r;
17         num/=10;
18     }
19     return sum;
20 }

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
(c) Microsoft Corporation. All rights reserved.
C:\Users\user\Downloads\Advanced coding>cd Assign 1
C:\Users\user\Downloads\Advanced coding\Assign 1>gcc 1.c
C:\Users\user\Downloads\Advanced coding\Assign 1>1.exe
enter the number: 345
the sum is 12
```

2) Write a C program to find first and last digit of a number.

Code and Output:

```
C 2.c x
Assign 1 > C 2.c > main()
1  #include<stdio.h>
2  int main(){
3      int num;
4      int first,last=0;
5      printf("enter the number: ");
6      scanf("%d",&num);
7      int temp=num;
8      last=temp%10;
9      while(temp>10){
10         temp/=10;
11     }
12     first=temp;
13     printf("the first digit is : %d \n",first);
14     printf("the last digit is:  %d\n",last);
15 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Microsoft Windows [Version 10.0.19045.5198]  
(c) Microsoft Corporation. All rights reserved.

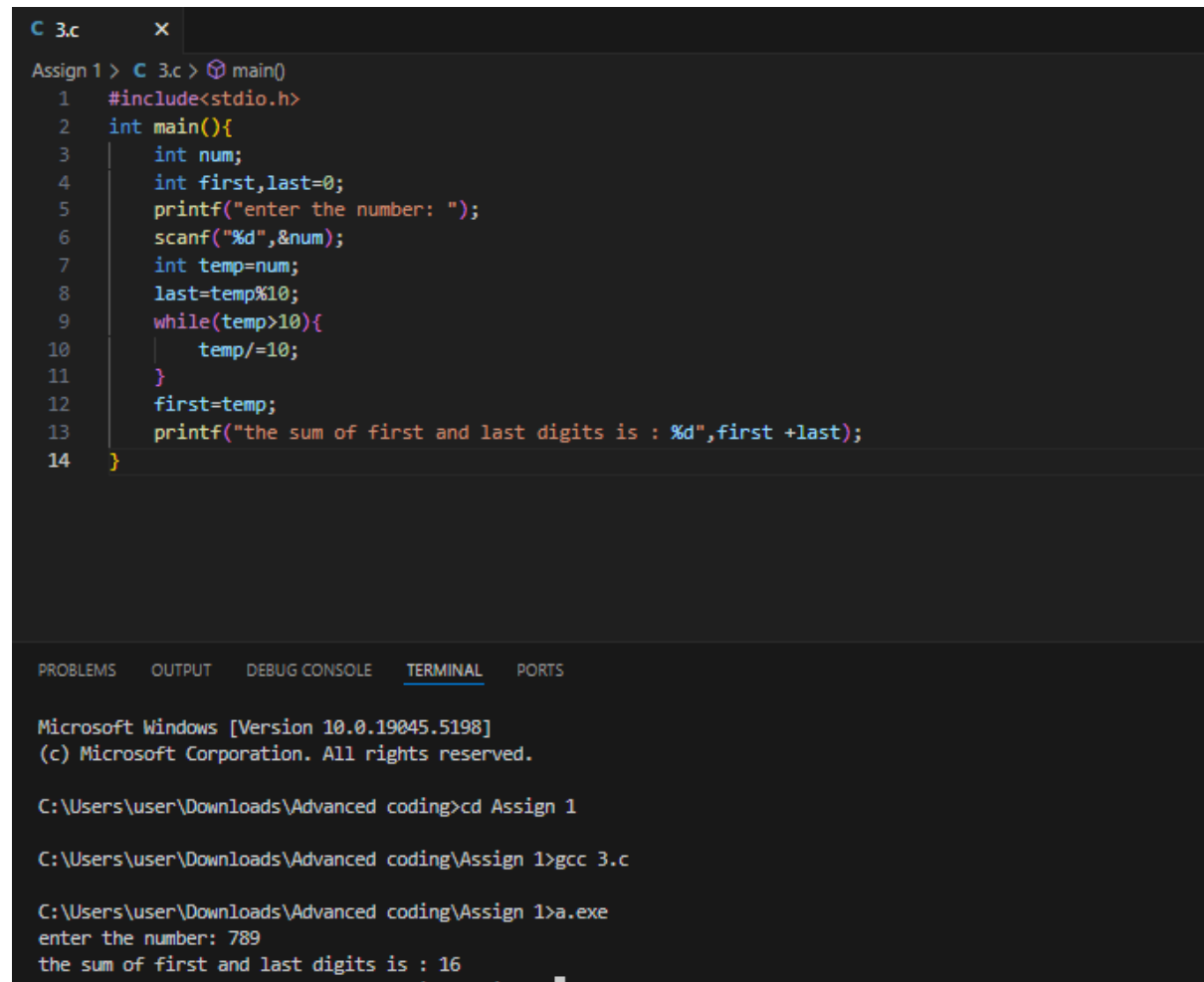
C:\Users\user\Downloads\Advanced coding>cd Assign 1

C:\Users\user\Downloads\Advanced coding\Assign 1>gcc 2.c

C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe  
enter the number: 12489  
the first digit is : 1  
the last digit is: 9

3) Write a C program to find sum of first and last digit of a number.

Code and Output:



The image shows a screenshot of a code editor and a terminal window. The code editor at the top displays a C program named '3.c' with the following code:

```
1  #include<stdio.h>
2  int main(){
3      int num;
4      int first,last=0;
5      printf("enter the number: ");
6      scanf("%d",&num);
7      int temp=num;
8      last=temp%10;
9      while(temp>10){
10         temp/=10;
11     }
12     first=temp;
13     printf("the sum of first and last digits is : %d",first +last);
14 }
```

Below the code editor is a terminal window with tabs for 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL', and 'PORTS'. The 'TERMINAL' tab is active, showing the following output:

```
Microsoft Windows [Version 10.0.19045.5198]
(c) Microsoft Corporation. All rights reserved.

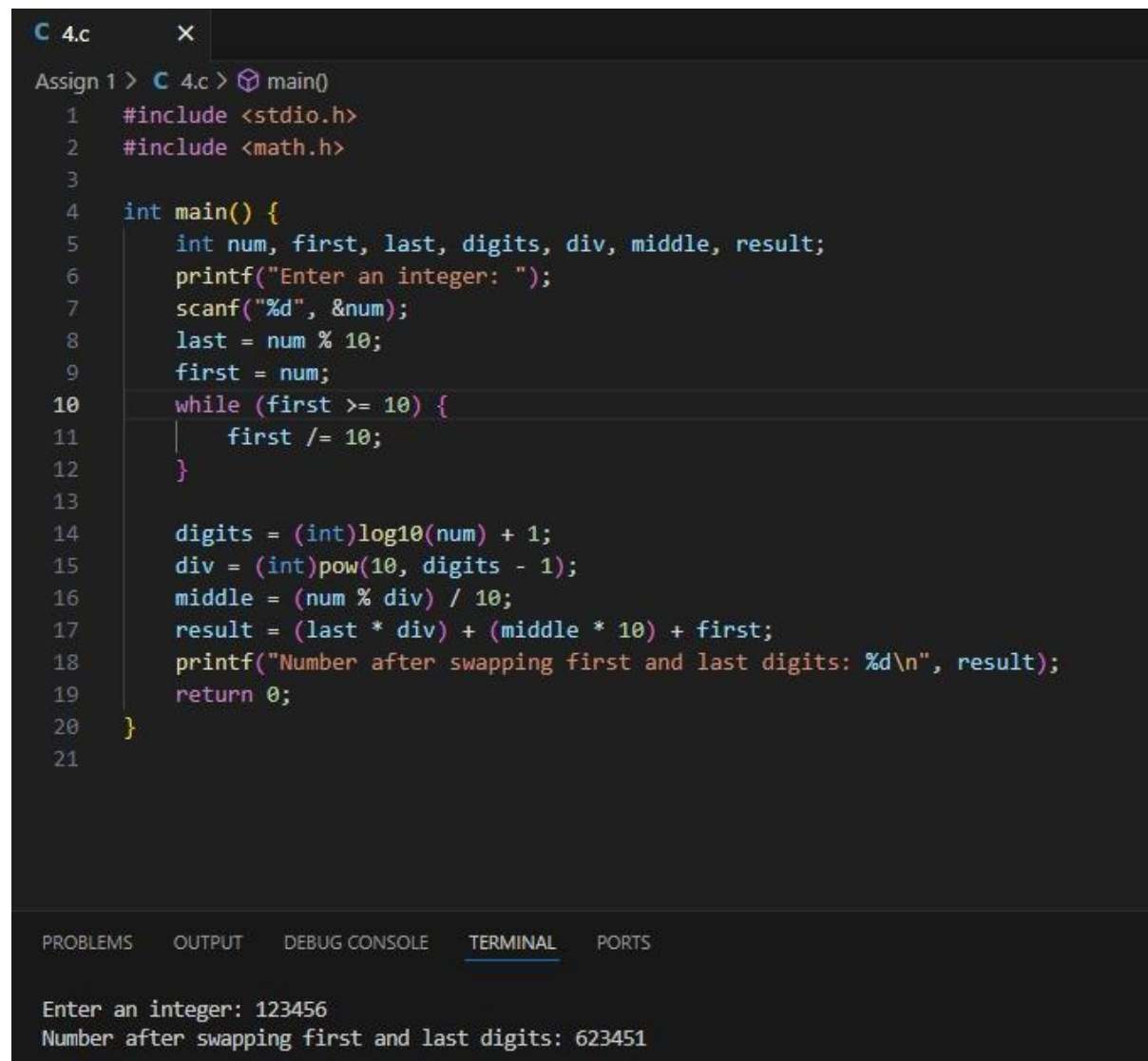
C:\Users\user\Downloads\Advanced coding>cd Assign 1

C:\Users\user\Downloads\Advanced coding\Assign 1>gcc 3.c

C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe
enter the number: 789
the sum of first and last digits is : 16
```

4) Write a C program to swap first and last digits of a number.

Code and Output:



```
C 4.c X
Assign 1 > C 4.c > main()
1  #include <stdio.h>
2  #include <math.h>
3
4  int main() {
5      int num, first, last, digits, div, middle, result;
6      printf("Enter an integer: ");
7      scanf("%d", &num);
8      last = num % 10;
9      first = num;
10     while (first >= 10) {
11         first /= 10;
12     }
13
14     digits = (int)log10(num) + 1;
15     div = (int)pow(10, digits - 1);
16     middle = (num % div) / 10;
17     result = (last * div) + (middle * 10) + first;
18     printf("Number after swapping first and last digits: %d\n", result);
19     return 0;
20 }
21
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Enter an integer: 123456
Number after swapping first and last digits: 623451
```

5) Write a C program to find frequency of each digit in a given integer.

Code and Output:

```
C 5.c x
Assign 1 > C 5.c > main()
1  #include<stdio.h>
2  int main(){
3      int num;
4      printf("enter a number: ");
5      scanf("%d",&num);
6      int frequency[10]={0};
7      if(num<0){
8          num=-num;
9      }
10     while(num>0){
11         int r=num%10;
12         frequency[r]++;
13         num/=10;
14     }
15     printf("digit frequencies: \n");
16     for(int i=0;i<10;i++){
17         if(frequency[i]>0){
18             printf("frequency of digit %d : %d\n",i,frequency[i]);
19         }
20     }
21 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe  
enter a number: 112243  
digit frequencies:  
frequency of digit 1 : 2  
frequency of digit 2 : 2  
frequency of digit 3 : 1  
frequency of digit 4 : 1

6) Write a C program to enter a number and print it in words.

Code :

```
6.c
Assign 1 > C 6.c > printNumberInWords(int)
1  #include <stdio.h>
2  void printNumberInWords(int num) {
3      if (num == 0) {
4          printf("Zero");
5          return;
6      }
7      int reversed = 0, isNegative = 0;
8      if (num < 0) {
9          isNegative = 1;
10         num = -num;
11     }
12     while (num > 0) {
13         reversed = reversed * 10 + (num % 10);
14         num /= 10;
15     }
16     if (isNegative) {
17         printf("Minus ");
18     }
19     while (reversed > 0) {
20         switch (reversed % 10) {
21             case 0: printf("Zero "); break;
22             case 1: printf("One "); break;
23             case 2: printf("Two "); break;
24             case 3: printf("Three "); break;
25             case 4: printf("Four "); break;
26             case 5: printf("Five "); break;
27             case 6: printf("Six "); break;
28             case 7: printf("Seven "); break;
29             case 8: printf("Eight "); break;
30             case 9: printf("Nine "); break;
31         }
32         reversed /= 10;
33     }
34 }
35 int main() {
36     int number;
37     printf("Enter a number: ");
38     scanf("%d", &number);
39     printf("Number in words: ");
40     printNumberInWords(number);
41     printf("\n");
42     return 0;
43 }
44
```

Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

C:\Users\user\Downloads\Advanced coding\Assign 1>gcc 6.c

C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe
Enter a number: -458
Number in words: Minus Four Five Eight

C:\Users\user\Downloads\Advanced coding\Assign 1>
```

7) Write a C program to find one's complement of a binary number.

Code and Output:

```
C 7.c x
Assign 1 > C 7.c > findOnesComplement(char [])
1  #include <stdio.h>
2  #include <string.h>
3
4  void findOnesComplement(char binary[]) {
5      for (int i = 0; binary[i] != '\0'; i++) {
6          if (binary[i] == '0') {
7              binary[i] = '1';
8          } else if (binary[i] == '1') {
9              binary[i] = '0';
10         } else {
11             printf("Invalid binary number.\n");
12             return;
13         }
14     }
15     printf("One's complement: %s\n", binary);
16 }
17
18 int main() {
19     char binary[100];
20     printf("Enter a binary number: ");
21     scanf("%s", binary);
22     findOnesComplement(binary);
23     return 0;
24 }
25
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe
C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe
Enter a binary number: 1101
Enter a binary number: 1101
One's complement: 0010
```

8) Write a C program to find two's complement of a binary number.

Code and Output:

```
C 8.c
Assign 1 > C 8.c > findTwosComplement(char [])
1  #include <stdio.h>
2  #include <string.h>
3  void findOnesComplement(char binary[]) {
4      for (int i = 0; binary[i] != '\0'; i++) {
5          if (binary[i] == '0') {
6              binary[i] = '1';
7          } else if (binary[i] == '1') {
8              binary[i] = '0';
9          } else {
10             printf("Invalid binary number.\n");
11             return;
12         }
13     }
14 }
15
16 void findTwosComplement(char binary[]) {
17     findOnesComplement(binary);
18     int length = strlen(binary);
19     int carry = 1;
20     for (int i = length - 1; i >= 0; i--) {
21         if (binary[i] == '1' && carry == 1) {
22             binary[i] = '0';
23         } else if (binary[i] == '0' && carry == 1) {
24             binary[i] = '1';
25             carry = 0;
26         }
27     }
28     printf("Two's complement: %s\n", binary);
29 }
30
31 int main() {
32     char binary[100];
33     printf("Enter a binary number: ");
34     scanf("%s", binary);
35     findTwosComplement(binary);
36     return 0;
37 }
38
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe  
Enter a binary number: 1101101  
Two's complement: 0010011



9) Write a C program to convert Decimal to Hexadecimal number system

Code and Output:

```
C 9.c x
Assign 1 > C 9.c > main()
1  #include <stdio.h>
2  void decimalToHexadecimal(int decimal) {
3      char hexadecimal[100];
4      int index = 0;
5      if (decimal == 0) {
6          printf("Hexadecimal: 0\n");
7          return;
8      }
9      while (decimal > 0) {
10         int remainder = decimal % 16;
11         if (remainder < 10) {
12             hexadecimal[index++] = '0' + remainder;
13         } else {
14             hexadecimal[index++] = 'A' + (remainder - 10);
15         }
16         decimal /= 16;
17     }
18     printf("Hexadecimal: ");
19     for (int i = index - 1; i >= 0; i--) {
20         putchar(hexadecimal[i]);
21     }
22     printf("\n");
23 }
24 int main() {
25     int decimal;
26     printf("Enter a decimal number: ");
27     scanf("%d", &decimal);
28
29     if (decimal < 0) {
30         printf("Please enter a non-negative decimal number.\n");
31     } else {
32         decimalToHexadecimal(decimal);
33     }
34
35     return 0;
36 }
~..
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
(c) Microsoft Corporation. All rights reserved.
C:\Users\user\Downloads\Advanced coding>cd Assign 1
C:\Users\user\Downloads\Advanced coding\Assign 1>gcc 9.c
C:\Users\user\Downloads\Advanced coding\Assign 1>a.exe
Enter a decimal number: 110101
Hexadecimal: 1AE15
```