



Royal University of Bhutan

**GYALPOZHING COLLEGE  
OF  
INFORMATION TECHNOLOGY**



*Assignment 1  
C Programming ITP203*

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Question 1

Ans: Given Binary number is (01110)  
 1's complement is 10001  
 2's complement is (1's complement + 1) i.e.

$$\begin{array}{r} 10001 \text{ (1's complement)} \\ + 1 \\ \hline 10010 \text{ (2's complement)} \end{array}$$

∴ 2's complement is 10010.

Question 2

Ans: Given Binary is (10001)  
 ∴ 1's complement is 01110 //

Question 3

Ans:

$$\begin{array}{r} 00101 \\ 101 \overline{) 11010} \\ \underline{0 \downarrow 11} \phantom{0} \\ 11 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ \underline{-0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ 110 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ \underline{-101} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ 0011 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ \underline{-0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ 110 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ \underline{-101} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ 001 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \end{array}$$

∴ Remainder = 001

Quotient = 00101

Question 4.

$$(75)_{10} \rightarrow (?)_{16}$$

$$\begin{array}{r}
 75 \div 2 = 37 \text{ remainder } 1 \\
 37 \div 2 = 18 \text{ remainder } 1 \\
 18 \div 2 = 9 \text{ remainder } 0 \\
 9 \div 2 = 4 \text{ remainder } 1 \\
 4 \div 2 = 2 \text{ remainder } 0 \\
 2 \div 2 = 1 \text{ remainder } 0 \\
 1 \div 2 = 0 \text{ remainder } 1
 \end{array}$$

∴ binary is  $(1001011)_2$

$$\therefore (75)_{10} \rightarrow (1001011)_2$$

converting  $(1001011)_2$  to Hexadecimal

0100 1011

4

B

∴ Hexadecimal is

 $(4B)_{16}$ 

$$\therefore (75)_{10} \rightarrow (4B)_{16}$$



Question 5

$$(776)_8 + (01011011)_2 \rightarrow (?)_8$$

Firstly convert  $(01011011)_2$  to octal  
converting base 2 to 10

$$(01011011)_2$$

$$\begin{aligned} \text{Now : } & (1 \times 2^0) + (1 \times 2^1) + (0 \times 2^2) + (0 \times 2^3) + (1 \times 2^4) + \\ & (1 \times 2^5) + (0 \times 2^6) + (1 \times 2^7) + (0 \times 2^8) \\ & = 1 + 2 + 4 + 0 + 16 + 32 + 128 + 0 \\ & = 183 \end{aligned}$$

$$\therefore (183)_{10}$$

Then convert base 10 to 8

8	183	7
8	22	6
	2	

$$\therefore (183)_{10} \rightarrow (267)_8$$

$$(776)_8 + (267)_8 = (1265)_8$$

//

1	1	7	6
2	6	7	
1265			

Question 6:

$$(10221102.102)_3 = (?)_9$$

$$(10221102.102)_3$$

$$= (2 \times 3^0) + (0 \times 3^1) + (1 \times 3^2) + (1 \times 3^3) + (2 \times 3^4) + (2 \times 3^5) + (0 \times 3^6) + (1 \times 3^7) + (1 \times 3^{-1}) + (0 \times 3^{-2}) + (2 \times 3^{-3})$$

$$2873.407 \rightarrow (?)_9$$

$$\begin{array}{r|l} 9 & 2873 \\ \hline & 319 \\ 9 & 35 \\ & 3 \end{array} \quad \begin{array}{l} 2 \\ 4 \\ 8 \\ 3 \end{array} = 3842$$

$$\therefore 0.407 \times 9 = 3.663 \rightarrow 3$$

$$0.663 \times 9 = 5.967 \rightarrow 5$$

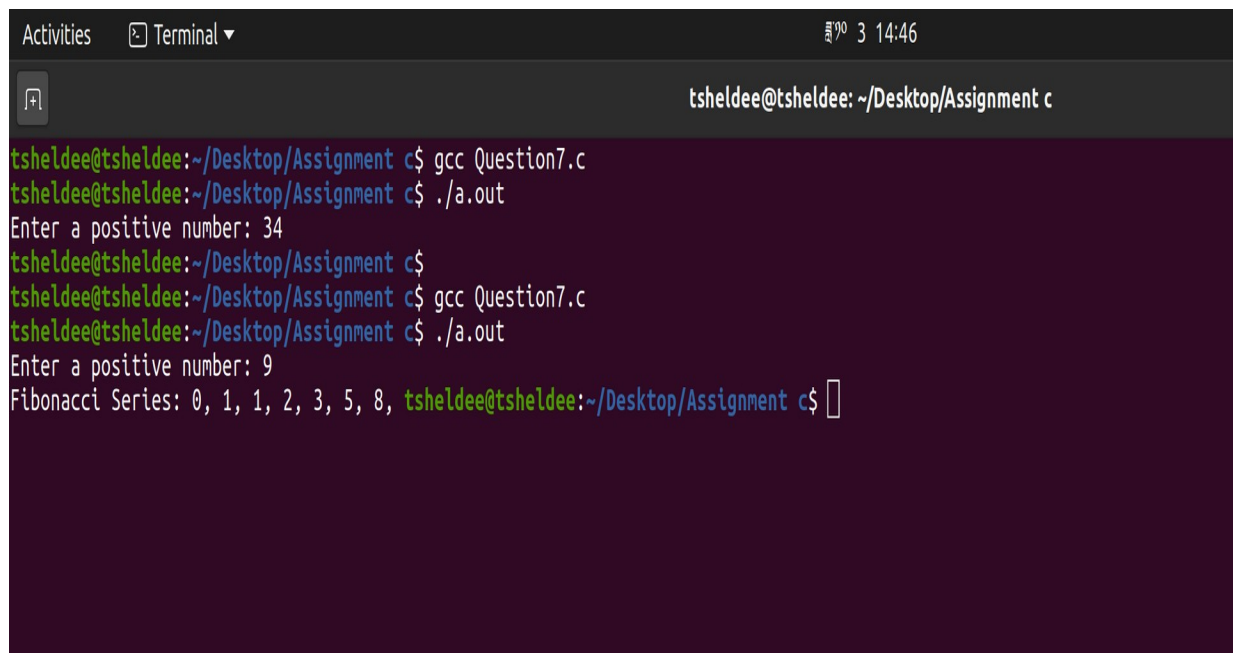
$$0.967 \times 9 = 8.703 \rightarrow 8$$

$$= (3842.358)_9$$

$$\therefore (10221102.102)_3 = (3842.358)_9 //$$

**Question7**

```
#include <stdio.h>
int main() {
    int x1 = 0, x2 = 1, nextTerm = 0, n;
    printf("Enter a positive number: ");
    scanf("%d", &n);
    printf("Fibonacci Series: %d, %d, ", x1, x2);
    nextTerm = x1 + x2;
    while (nextTerm <= n) {
        printf("%d, ", nextTerm);
        x1 = x2;
        x2 = nextTerm;
        nextTerm = x1 + x2;
    }
    return 0;
}
```

**Output**A terminal window titled 'Terminal' with a clock icon and '3 14:46' in the top right. The terminal shows the user 'tsheldee' at host 'tsheldee' in directory '~/Desktop/Assignment c'. The user runs 'gcc Question7.c' and './a.out'. The program prompts 'Enter a positive number: 34' and then 'Enter a positive number: 9'. For the input 9, it outputs 'Fibonacci Series: 0, 1, 1, 2, 3, 5, 8,' followed by a prompt. The terminal has a dark purple background.

```
Activities  Terminal  3 14:46
tsheldee@tsheldee: ~/Desktop/Assignment c
tsheldee@tsheldee:~/Desktop/Assignment c$ gcc Question7.c
tsheldee@tsheldee:~/Desktop/Assignment c$ ./a.out
Enter a positive number: 34
tsheldee@tsheldee:~/Desktop/Assignment c$
tsheldee@tsheldee:~/Desktop/Assignment c$ gcc Question7.c
tsheldee@tsheldee:~/Desktop/Assignment c$ ./a.out
Enter a positive number: 9
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, tsheldee@tsheldee:~/Desktop/Assignment c$
```

**Question 8**

```
#include <stdio.h>
int main() {

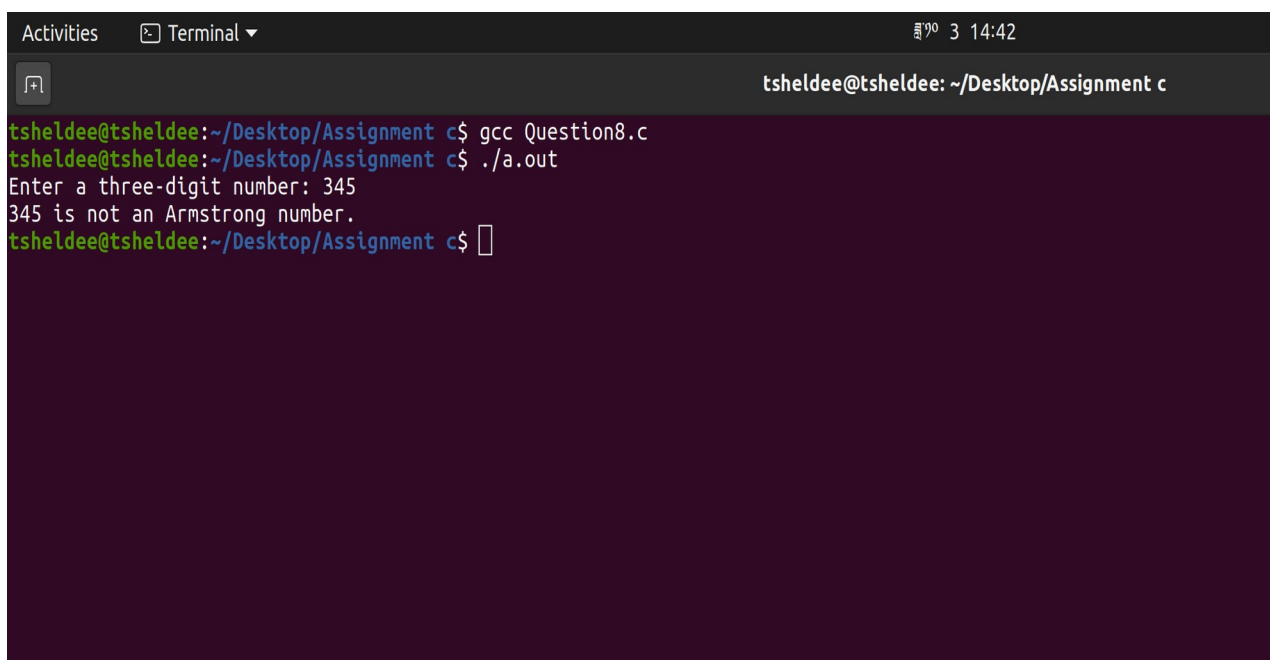
    int num, Number, remainder, result = 0;;

    printf("Enter a three-digit number: ");
    scanf("%d", &num);

    Number = num;
    while (Number != 0) {
        // remainder contains the last digit
        remainder = Number % 10;

        result += remainder * remainder * remainder;

        // removing last digit from the original number
        Number = Number / 10;
    }
    if (result == num)
        printf("%d is an Armstrong number.", num);
    else
        printf("%d is not an Armstrong number.", num);
    printf("\n");
    return 0;
}
```

**Output**A terminal window titled 'Terminal' with a dark background. The prompt is 'tsheldee@tsheldee: ~/Desktop/Assignment c'. The user enters 'gcc Question8.c' and presses enter. The prompt changes to 'tsheldee@tsheldee:~/Desktop/Assignment c\$'. The user enters './a.out' and presses enter. The prompt changes to 'tsheldee@tsheldee:~/Desktop/Assignment c\$'. The program outputs 'Enter a three-digit number: 345'. The user enters '345' and presses enter. The program outputs '345 is not an Armstrong number.'. The prompt changes to 'tsheldee@tsheldee:~/Desktop/Assignment c\$'.

```
tsheldee@tsheldee:~/Desktop/Assignment c$ gcc Question8.c
tsheldee@tsheldee:~/Desktop/Assignment c$ ./a.out
Enter a three-digit number: 345
345 is not an Armstrong number.
tsheldee@tsheldee:~/Desktop/Assignment c$
```