Lab

CPE100 Computer Programming for Engineers

Charunthon Limseelo 65070503410

Assoc.Prof. Dr. Natasha Dejdumrong

Instructor's Name

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LAB 01:- LOGIC TABLE

Write a C program to create a logic table for these operators: AND, OR, XOR, IF, and IF and only if, where 0 means False and 1 means True. The examples of the result is shown as follows.

```
+---+---+-------+-------+-------+-----------+-------+
| A | B |A AND B|A OR  B|A XOR B|IF A THEN B|A IFF B|
+---+---+-------+-------+-------+-----------+-------+
| 0 | 0 |   0   |   0   |   0   |     1     |   1   |
| 0 | 1 |   0   |   1   |   1   |     1     |   0   |
| 1 | 0 |   0   |   1   |   1   |     0     |   0   |
| 1 | 1 |   1   |   1   |   0   |     1     |   1   |
+---+---+-------+-------+-------+-----------+-------+
```

```
#include <stdio.h>
int main()
{
    int a,b,temp,i;

    printf("\t+---+---+-------+-------+-------+-----------+-------+\n");
    printf("\t| A | B |A and B|A  or B|A XOR B|IF A THEN B|A IFF B|\n");
    printf("\t+---+---+-------+-------+-------+-----------+-------+\n");
    for(i=0;i<4;i++)
    {
        temp=i;
        a=i%2;
        temp/=2;
        b=temp%2;
    printf("\t| %d | %d |   %d   |   %d   |   %d   |     %d     |   %d   |
\n",b,a,a&&b,a||b,a^b,a||!b,a && b || !a && !b);
    }
    printf("\t+---+---+-------+-------+-------+-----------+-------+\n");
}
```

LAB 02:- Binary number of a Decimal

Write a C program to convert an integer into its binary number with 16 digits.

```
#include <stdio.h>
int main(){
    int n, remainder;
    int binary = 0, temp = 1;

    printf("Enter the number to convert: ");
    scanf("%d",&n);

    while(n != 0)
    {
        remainder = n % 2;
        n = n / 2;
        binary = binary + (remainder * temp);
        temp = temp * 10;
    }
    printf("\nBinary of Given Number is= %.16d \n", binary);
    return 0;
}
```

LAB 03:- Hexadecimal number of a Decimal

Write a C program to convert an integer into its hexadecimal number with 8 digits, where A = 10, B = 11, C = 12, D = 13, E = 14, and F = 15. The built-in printf function with "%X" is not allowed to be used in this question.

```
#include <stdio.h>
#include <string.h>
int main() {
        int decimalNum;
        char result[100];
        int hexadecimal[100];
        int i=0, j;

        printf("Enter any decimal number: ");
        scanf("%d",&decimalNum);

        do
        {
                hexadecimal[i] = decimalNum % 16;
                decimalNum /= 16;
                i++;
        }
        while(decimalNum > 0);

        printf("Equivalent hexadecimal value of decimal number %d: ", decimalNum);

        for (j = i -1 ; j>= 0;j--)
        {
                switch(hexadecimal[j])
                {
                        case 0 : strcat(result, "0"); break;
                        case 1 : strcat(result, "1"); break;
                        case 2 : strcat(result, "2"); break;
                        case 3 : strcat(result, "3"); break;
                        case 4 : strcat(result, "4"); break;
                        case 5 : strcat(result, "5"); break;
                        case 6 : strcat(result, "6"); break;
                        case 7 : strcat(result, "7"); break;
                        case 8 : strcat(result, "8"); break;
                        case 9 : strcat(result, "9"); break;
                        case 10 : strcat(result, "A"); break;
                        case 11 : strcat(result, "B"); break;
                        case 12 : strcat(result, "C"); break;
                        case 13 : strcat(result, "D"); break;
                        case 14 : strcat(result, "E"); break;
                        case 15 : strcat(result, "F"); break;
                }
        }
        printf("%8s\n", result);
        return 0;
}
```