



## Lab 3

### Objectives:

1. Logical operators
2. if condition - else if - Nested if
3. switch statement

1. A **palindrome** is a number or a text phrase that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: **12321**, **55555**, **45554** and **11611**. Write a program that reads in a **five-digit integer** and determines whether it is a palindrome or not.

```
#include <stdio.h>
void main ( )
{
    long x,temp;
    int d1, d2, d3, d4, d5;
    printf( "Enter the number to be checked: ");
    scanf( "%ld", &x);
    temp = x;
    d1 = x % 10; x = x / 10;
    d2 = x % 10; x = x / 10;
    d3 = x % 10; x = x / 10;
    d4 = x % 10; x = x / 10;
    d5 = x;
    if ((d1 == d5) && (d2 == d4)) {
        printf( "The number %ld is a palindrome\n", temp);
    }
    else {
        printf( "The number %ld is a NOT palindrome\n", temp);
    }
}
```

```
"C:\Users\Y. Taha\Documents\Lab3\bin\Debug\Lab3.exe"
Enter the number to be checked: 25452
The number 25452 is a palindrome
Process returned 0 (0x0)   execution time : 7.923 s
Press any key to continue.
```

```
"C:\Users\Y. Taha\Documents\Lab3\bin\Debug\Lab3.exe"
Enter the number to be checked: 8732738
The number 8732738 is a NOT palindrome
Process returned 0 (0x0)   execution time : 15.931 s
Press any key to continue.
```

```
"C:\Users\Y. Taha\Documents\Lab3\bin\Debug\Lab3.exe"
Enter the number to be checked: 934439
The number 934439 is a NOT palindrome
Process returned 0 (0x0)   execution time : 14.479 s
Press any key to continue.
```



2. Write a program that reads an integer that represents student's grade and then prints the equivalent letter grade.

Score	Grade
score >= 90	A
90 > score >= 80	B
80 > score >= 70	C
70 > score >= 60	D
score < 60	F

```
#include <stdio.h>

void main ( )
{
    float score;
    char grade;
    printf( "Enter the score: ");
    scanf( "%f", &score);
    if (score >= 90)
        {grade = 'A';}
    else if (score >= 80)
        {grade = 'B';}
    else if (score >= 70)
        {grade = 'C';}
    else if (score >= 60)
        {grade = 'D';}
    else
        {grade = 'F';}
    printf( "The Grade for score %.1f is: %c\n", score , grade);
}
```

The following screenshots show the program's execution for different input scores:

- First Screenshot:** The program outputs "The Grade for score 84.0 is: B".
- Second Screenshot:** The user enters the score "38", and the program outputs "The Grade for score 38.0 is: F".
- Third Screenshot:** The user enters the score "93", and the program outputs "The Grade for score 93.0 is: A".



3. An online retailer sells five different products whose retail prices are shown in the following table:

Product number	Retail Price
1	\$4.32
2	\$5.43
3	\$6.54
4	\$7.65
5	\$8.76

Write a program that reads **Product number** and **Quantity sold** and then prints **total retail price** for the entered product. Your program should use a **switch** statement to help determine the retail price for the entered product.

```
#include <stdio.h>
void main ( )
{
    int pnumber, quant, flag = 1;
    float price;
    printf( "Enter the Product Number: ");
    scanf( "%d", &pnumber);
    printf( "Enter the Quantity sold: ");
    scanf( "%d", &quant);
    switch (pnumber) {
        case 1:
            price = quant * 4.32; break;
        case 2:
            price = quant * 5.43; break;
        case 3:
            price = quant * 6.54; break;
        case 4:
            price = quant * 7.65; break;
        case 5:
            price = quant * 8.76; break;
        default:
            flag = 0;
    }
    if (flag == 1) {
        printf( "The price of %d items of product %d is: $%.2f\n", quant, pnumber, price);
    }
    else {
        printf( "The Product Number: %d is wrong\n", pnumber);
    }
}
```

```
"C:\Users\Y. Taha\Documents\Lab3\bin\Debug\Lab3.exe"
Enter the Product Number: 8
Enter the Quantity sold: 100
The Product Number: 8 is wrong

Process returned 0 (0x0)   execution time : 3.753 s
Press any key to continue.

"C:\Users\Y. Taha\Documents\Lab3\bin\Debug\Lab3.exe"
Enter the Product Number: 2
Enter the Quantity sold: 1000
The price of 1000 items of product 2 is: $5430.00

Process returned 0 (0x0)   execution time : 5.959 s
Press any key to continue.
```



4. Write a program that reads an integer and determines and prints whether it is odd or even.

```
#include <stdio.h>
int main ( )
{
    int n;
    printf( "Enter the number to be checked: ");
    scanf( "%d", &n);
    if ( n % 2 == 0) {
        printf( "The number %d is even\n", n);
    }
    else {
        printf( "The number %d is odd\n", n);
    }
    return 0;
}
```

```
"C:\Users\Y. Taha\Documents\Lab3\bin\Debug\Lab3.exe"
Enter the number to be checked: 25
The number 25 is odd

Process returned 0 (0x0)   execution time : 2.021 s
Press any key to continue.
_
```

```
"C:\Users\Y. Taha\Documents\Lab3\bin\Debug\Lab3.exe"
Enter the number to be checked: 148
The number 148 is even

Process returned 0 (0x0)   execution time : 5.185 s
Press any key to continue.
_
```



**Assignment:**

1. Write a program that reads in three integers and then determines and prints the **largest** and the **smallest** integers in the group.

**Sample Run:**

Input three integers: 4 5 3

5 is the largest, 3 is the Smallest

2. Write a C program to read the **quantity**, **unit price** and **discount type** for any item. Your program will calculate the net Price according to the following table and then print out the quantity, unit price, discount type, net price.

Discount Type	Discount
1	10%
2	15%
Others	5%

Good Luck,,,