Programming Fundamentals Lab
Lab Assignment 06

Course Code: CL1002

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Task 01

Find out the given number is even or not using Ternary Operator in C.

```c
#include<stdio.h>
main(){
    int c,num,modnum;
    printf("Enter number: ");
    scanf("%d",&num);
    modnum=num % 2;
    c=(modnum==0?printf("Its even...\n"):printf("Its odd...\n"));

}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 6\q1.exe
Enter number: 21
Its odd...

--------------------------------
Process exited after 148.6 seconds with return value 11
Press any key to continue . . .
```

Task 02

Write a program to find the greatest number among three numbers using nested if else.

```c
#include<stdio.h>

int main(){
    int a,b,c;
    printf("Enter numbers:\n");
    scanf("%d",&a);
    scanf("%d",&b);
    scanf("%d",&c);
    if (a>b){
        if (a>c)
        printf("%d is greatest",a);
    }
    if (b>a){
        if (b>c)
        printf("%d is greatest",b);
    }
    if (c>a){
        if(c>b)
        printf("%d is greatest",c);
}

}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 6\q2.exe
Enter numbers:
45
50
60
60 is greatest
--------------------------------
Process exited after 5.216 seconds with return value 14
Press any key to continue . . .
```

Task 03

Rewrite the following program segment using the if-else statements instead of the ternary operator.

String grade = (mark >= 90) ? “A” : (mark >= 80) ? “B” : “C”);

q1.c q2.c q3.c

```c
#include<stdio.h>
main(){
    int marks;
    printf("Enter marks here:\n");
    scanf("%d",&marks);
    if (marks>=80){
        if (marks>=90)
        printf("Grade is A");
        if (marks>=80 && marks<90)
        printf("Grade is B");
    }
    else
    printf("Grade is C");
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 6\q3.exe
Enter marks here:
85
Grade is B
--------------------------------
Process exited after 18.18 seconds with return value 10
Press any key to continue . . .
```

Task 04

A restaurant named SandwichesTown makes sandwiches. You order a sandwich and you're asked what kind

of sandwich you would like: chicken, beef or vegetarian. You select vegetarian and you're asked to select from a choice of three vegetarian combinations:

- Tomato and mozzarella
- Eggplant and parmesan
- Cucumber and Swiss cheese

In this case when you choose chicken or beef you have no more choices to make. But when you choose vegetarian, you'd then have to choose what kind of vegetarian sandwich you like. Write a program to implement these procedures.

q4.c

```c
#include<Stdio.h>
main(){
    char choice, combo;
    printf("What kind of sandwich you want to order Chicken(c), beef(b), vegetarian(v)?\n");
    scanf("%c",&choice);
    switch(choice){
        case 'v':
            printf("What combinaion would you like?\n");
            printf("1. Tomato and Mozarella\n");
            printf("2. Eggplant and parmesan\n");
            printf("3. Cucumber and swiss cheese\n");
            fflush(stdin);
            scanf("%c",&combo);
            switch(combo){
                case '1':
                    printf("Your order is Tomato and Mozarella veg sandwich");break;
                case '2':
                    printf("Your order is Eggplant and parmesan Veg sandwich...");break;
                case '3':
                    printf("Your order is Cucumber and swiss cheese Veg sandwich...");break;
            default:
                printf("Invalid input");}
        break;
    case 'c': printf("You've ordered a chicken sandwich...");break;
    case 'b': printf("You've ordered a beef sandwich");break;
    default: printf("Invalid input");
    }
}
```

```
What kind of sandwich you want to order Chicken(c), beef(b), vegetarian(v)?
b
You've ordered a beef sandwich
--------------------------------
Process exited after 1.552 seconds with return value 30
Press any key to continue . . .
```

```
What kind of sandwich you want to order Chicken(c), beef(b), vegetarian(v)?
v
What combinaion would you like?
1. Tomato and Mozarella
2. Eggplant and parmesan
3. Cucumber and swiss cheese
2
Your order is Eggplant and parmesan Veg sandwich...
--------------------------------
Process exited after 4.755 seconds with return value 51
Press any key to continue . . .
```

Task 05

A leap year is a year that has 366 days, instead of 365 days. It has one day extra in the month of February.

Leap years occur once in 4 years, so any year that is completely divisible by four should be a leap year. But

this is not always true. If there is some year and it is divisible by hundred, it will be a leap year only if it is

also divisible by four hundred. Given a year, check if it a leap year or not using nested if else statement.

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

    int year;
    printf("Enter a year: ");
    scanf("%d",&year);
    if (year%100==0){

        if (year%400==0)
        printf("Its a leap year...\n");

        else
        printf("its not a leap year...\n");
        }

    else if(year%4==0)
        printf("Its a leap year...\n");

    else
    printf("its not a leap year...\n");
}
```

```
Enter a year: 2016
Its a leap year...

--------------------------------
Process exited after 8.542 seconds with return value 0
Press any key to continue . . .
```

```
Enter a year: 2100
its not a leap year...

--------------------------------
Process exited after 8.198 seconds with return value 0
Press any key to continue . . .
```

Task 06

Check whether the triangle is equilateral, scalene, or isosceles.

• Isosceles triangle: In geometry, an isosceles triangle is a triangle that has two sides of equal length.

• Equilateral triangle: In geometry, an equilateral triangle is a triangle in which all three sides are equal.

• Scalene triangle: A scalene triangle is a triangle that has three unequal sides.

```c
#include<stdio.h>
main(){
    int side1,side2,side3;
    printf("Enter first side: ");
    scanf("%d",&side1);
    printf("Enter second side: ");
    scanf("%d",&side2);
    printf("Enter third side: ");
    scanf("%d",&side3);

    if((side1==side2) || (side1==side3) || (side2==side3)){
        if ((side1==side2) && (side1==side3) && (side2==side3))
        printf("Equilateral Triangle...");
        else
        printf("Isosceles triangle...");
        }
    else if ((side1!=side2) && (side1!=side3) && (side2!=side3))
        printf("Scalene triangle...");
    }
```

```
Enter first side: 20
Enter second side: 10
Enter third side: 20
Isosceles triangle...
------------------------------
Enter first side: 10
Enter second side: 10
Enter third side: 10
Equilateral Triangle...
------------------------------
Enter first side: 20
Enter second side: 30
Enter third side: 10
Scalene triangle...
```

Task 07

Write a program to control a coffee machine….

```c
#include<stdio.h>
int main(){
    char coffee,size,response;
    printf("What type of coffee you want?\n");
    printf("White(W) \t Black(B)\n");
    scanf("%c",&coffee);
fflush(stdin);
    printf("Choose your cup size large(l) or small(s)\n");
    scanf("%c",&size);
fflush(stdin);
    printf("Is your coffee manual (y/n)?\n");
    scanf("%c",&response);
    if(response=='y'){
    switch (coffee){
        case 'W':
            switch(size){
                case 's':
                printf("\nPut water \t 15 min\n");
                printf("Sugar \t\t 15 min\n");
                printf("Mix well \t 20 min\n");
                printf("Add coffee \t 2 min\n");
                printf("Add milk \t 4 min\n");
                printf("Mix well \t 20 min\n");break;
                case 'l':
                printf("\nPut water \t 22.5 min\n");
                printf("Sugar \t\t 22.5 min\n");
                printf("Mix well \t 30 min\n");
                printf("Add coffee \t 3 min\n");
                printf("Add milk \t 6 min\n");
                printf("Mix well \t 30 min\n");break;
            default:printf("invalid input...");
            }
        break;
        case 'B':
            switch(size){
                case 's':
                printf("\nPut water \t 20 min\n");
                printf("Sugar \t\t 20 min\n");
                printf("Mix well \t 25 min\n");
                printf("Add coffee \t 15 min\n");
                printf("Mix well \t 25 min\n");break;
                case 'l':
                printf("\nPut water \t 30 min\n");
                printf("Sugar \t\t 30 min\n");
                printf("Mix well \t 37.5 min\n");
                printf("Add coffee \t 22.5 min\n");
                printf("Mix well \t 45 min\n");break;
            default:printf("invalid input...");
        }
        break;
    default :printf("invalid input...");}
    }
else if (response=='n')
    printf("Your order is placed and will be served automatically...");

}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 6\q7.exe
What type of coffee you want?
White(W)         Black(B)
W
Choose your cup size large(l) or small(s)
l
Is your coffee manual (y/n)?
y

Put water        22.5 min
Sugar            22.5 min
Mix well         30 min
Add coffee       3 min
Add milk         6 min
Mix well         30 min

--------------------------------
Process exited after 9.307 seconds with return value 0
Press any key to continue . . .
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 6\q7.exe
What type of coffee you want?
White(W)         Black(B)
B
Choose your cup size large(l) or small(s)
s
Is your coffee manual (y/n)?
y

Put water        20 min
Sugar            20 min
Mix well         25 min
Add coffee       15 min
Mix well         25 min

--------------------------------
Process exited after 13.97 seconds with return value 0
Press any key to continue
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 6\q7.exe
What type of coffee you want?
White(W)         Black(B)
B
Choose your cup size large(l) or small(s)
l
Is your coffee manual (y/n)?
n
Your order is placed and will be served automatically...
--------------------------------
Process exited after 5.898 seconds with return value 56
Press any key to continue . . .
```

Task 08

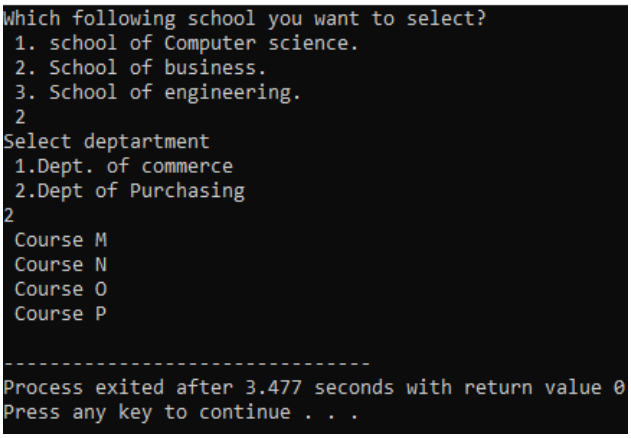
You are searching for a department in a university and you're asked to select a school from a choice of three

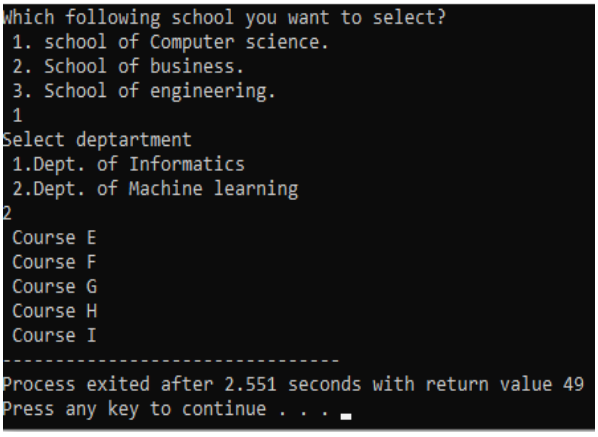
- School of Computer Science
- School of Business
- School of Engineering

… Write a program to make the above logic implementable.

```c
#include<Stdio.h>
main(){
    int course;
    char dept;
    printf("Which following school you want to select?\n");
    printf(" 1. school of Computer science.\n 2. School of business.\n 3. School of engineering.\n ")
    scanf("%d", &course);
    switch(course){
        case 1 :
        printf("Select deptartment\n");
        printf(" 1.Dept. of Informatics\n");
        printf(" 2.Dept. of Machine learning\n");
fflush(stdin);
        scanf("%c",&dept);
            switch (dept){
                case'1':
                printf(" Course A\n Course B\n Course C\n Course D");break;
                case'2':
                printf(" Course E\n Course F\n Course G\n Course H\n Course I");break;
            default :
            printf("Enter choice again...");}
        break;
        case 2 :
        printf("Select deptartment\n");
        printf(" 1.Dept. of commerce\n");
        printf(" 2.Dept of Purchasing\n");
fflush(stdin);
        scanf("%c",&dept);
            switch (dept){
                case'1':
                printf(" Course X\n Course Y\n Course Z\n");break;
                case'2':
                printf(" Course M\n Course N\n Course O\n Course P\n");break;
            default :
            printf("Enter choice again...");}
        break;
        case 3 :
        printf("Select deptartment\n ");
        printf(" 1.Dept. of mechanical engineering\n ");
        printf(" 2.Dept. of mechatronics engineering\n ");
fflush(stdin);
        scanf("%c",&dept);
            switch (dept){
                case'1':
                printf(" Course R\n Course S\n");break;
                case'2':
                printf(" Course J\n Course K\n Course L\n");break;
            default :
                printf("Enter choice again...");}
        break;
    deafault:
    printf("Enter choice again...");
}
```

Task 08 Output on next page…





Task 09

Mortgage Calculator) Develop a C program to calculate the interest accrued on a bank customers mortgage.

For each customer, the following facts are available:

a) the account number

b) the mortgage amount

c) the mortgage term

d) the interest rate

The program should input each fact, calculate the total interest payable (= mortgage amount × interest rate ×mortgage term), and add it to the mortgage amount to get the total amount payable. It should calculate the required monthly payment by dividing the total amount payable by the number of months in the mortgage term. The program should display the required monthly payment rounded off to the nearest dollar. The program should process each customer's account at a time. Here is a sample input/ output dialog:

Enter account number (-1 to end): 100

Enter mortgage amount (in dollars): 6500

Enter mortgage term (in years): 3

Enter interest rate (as a decimal): 0.075

The monthly payable interest $ 221

Enter account number (-1 to end): 200

Task 09 output on next page…

```c
#include<stdio.h>
main(){
int acc, amount, tot_int ,tot_amount, term ;
float rate, monthly_am ;
printf("Enter Accout number: ");
scanf("%d",&acc);
    printf("Enter Mortgage amount(in dollars): $ ");
    scanf("%d",&amount);
    printf("Enter Mortgage term(in years): ");
    scanf("%d",&term);
    printf("Enter interest rate: ");
    scanf("%f",&rate);
    if (acc>-1){

    tot_int=amount*rate*term;
    tot_amount=amount+tot_int;
    monthly_am=round((tot_amount/(term*12)));

    printf("Monthly payment amount is: $ %0.2f",monthly_am);

    }
    else
    printf("Invalid account number...");
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 6\q9.exe
Enter Accout number: 300
Enter Mortgage amount(in dollars): $ 20000
Enter Mortgage term(in years): 12
Enter interest rate: 0.05
Monthly payment amount is: $ 222.00
--------------------------------
Process exited after 24.97 seconds with return value 35
Press any key to continue . . .
```