**CS120 Fundamental of Programming**

**Homework 4: Logical Operators and Decision Structure**

**Homework Examples**

1. This program demonstrate the use of multiple-selection (i.e. multiple alternative) if and else structure.

#include <stdio.h>

int main()

{

int grade;

printf("Enter grade of student (between 0 and 4) : ");

scanf("%d", &grade);

if (grade == 4)

printf("Excellent");

else if (grade == 3)

printf("Good");

else if (grade == 2)

printf("Average");

else if (grade == 1)

printf("Poor");

else if (grade == 0)

printf("Failing");

else

printf("Illegal grade");

system("pause");

return 0;

}

1. This example demonstrates nested if..else (i.e. use of if/else within another if/else).

Input a number from the user. Check whether the number is zero, even or odd and print the result. If the number is even then check its divisibility by 4 and 6 and print the results. If the number is odd then check its divisibility by 3 and 5 and print the results.

#include <stdio.h>

int main()

{

int x;

printf("Enter a number : ");

scanf("%d", &x);

if ( x == 0 ) // zero case

printf("%d is zero\n", x);

else if ( x % 2 == 0 ) // even case

{

printf("%d is even\n", x);

if ( x % 4 == 0 )

printf("%d is divisible by 4\n", x);

if ( x % 6 == 0 )

printf("%d is divisible by 6\n", x);

}

else if ( x % 2 == 1 ) // odd case

{

printf("%d is odd\n", x);

if ( x % 3 == 0 )

printf("%d is divisible by 3\n", x);

if ( x % 5 == 0 )

printf("%d is divisible by 5\n", x);

}

system("pause");

return 0;

}

1. This example demonstrates use of multiple selection if..else and logical operators.

Write a C program that asks the user to enter a character and then displays whether the entered character is a small letter (a..z), a capital letter (A..Z), a digit (1..9), or a special letter (any thing else).

#include <stdio.h>

int main()

{

char ch;

printf("Enter a letter character : ");

scanf("%c", &ch);

if ( ch >= 'a' && ch <= 'z' )

printf("%c is small case letter\n", ch);

else if ( ch >= 'A' && ch <= 'Z' )

printf("%c is capital case letter\n", ch);

else

printf("%c is other letter\n", ch);

system("pause");

return 0;

}

**Homework Assignments**

1. The unit for electricity usage is kWh. For domestic usage, the monthly rate is 21.8 cents/unit for the first 200 unit, 25.8 cents/unit for the next 800 units and 27.8 cents/unit for each additional unit. Given the amount of electricity units (in kWh) used by a customer, write a program that will calculate and print the amount of money needs to be paid by the customer.
2. Write a program that inputs two numbers and an arithmetic operator (\*, /, +, –) from user. It performs arithmetic operation if operator is a valid arithmetic operator. Display the results of arithmetic operations for addition, subtraction, multiplication, division and remainder operators. Hint: use switch and case structure to perform the relevant operation.
3. Write a program to input student’s scores for five subjects, calculate the average score and find the relevant grade based on average score. The grade is assigned as per following scheme.

A – 91-100

B – 81-90

C – 71-80

D – 61-70

F – 0-60