**Lab 3**

In this week, we practice implementing in C++ small code with selection structure. Students can see some sample exercises and must prepare solution for all exercises in part B.

**A. Sample exercises.**

1. Write a program to say hello on the screen in the user language.

**SOLUTION:**

#include <iostream>

using namespace std;

int main(){

char lang;

cin >> "Where do you come from ";

cin >> "(V = Vietnam; A = American; F = France): ";

cin >> lang;

if (lang==’A’)

cout << "Hello ! ";

else if (lang==’F’)

cout << "Bonjour ! ";

else

cout << "Xin chao ! ";

cout << endl;

return 0;

}

1. Write and run a program that reads a character and writes out a name corresponding to the character:

if the character is ‘A’ or ‘a’ then the name is “An”

if the character is ‘B’ or ‘b’ then the name is “Bao”

if the character is ‘C’ or ‘c’ then the name is “Chi”

if the character is ‘D’ or ‘d’ then the name is “Dong”

otherwise, the name is just the character.

**SOLUTION:**

#include <iostream>

using namespace std;

int main() {

string ch;

cout<< "Type your character you want: "; cin>>ch;

// Processing with ch name

if (ch == "A" || ch == "a") {

cout<< "The name is An" <<endl;

}

else if (ch == "B" || ch == "b") {

cout<< "The name is Bao" <<endl;

}

else if (ch == "C" || ch == "c") {

cout<< "The name is Chi" <<endl;

}

else if (ch == "D" || ch == "D") {

cout<< "The name is Dong" <<endl;

}

else {

cout<< "The name is just " <<ch<<endl;

}

system("pause");

return 0;

}

**B. Exercises must to do.**

1. Write and run a program that reads an angle (expressed in degrees) and states in which quadrant the given angle lies. An angle *A* is said to be in the

first quadrant if it is in the range 0 ≤ A < 90

second quadrant if it is in the range 90 ≤ A < 180

third quadrant if it is in the range 180 ≤ A < 270

and fourth quadrant if it is in the range 270 ≤ A < 360.

1. Write and run a program that reads a month from the user and displays the number of days in that month.
2. Write and run a program that reads a numeric grade from a student and displays a corresponding character grade for that numeric grade. The program prints ‘A’ for exam grades greater than or equal to 90, ‘B’ for grades in the range 80 to 89, ‘C’ for grades in the range 70 to 79, ‘D’ for grades in the range 60 to 69 and ‘F’ for all other grades.
3. Write and run a program that reads a marriage code (one character) and writes out a message corresponding to the character:

if the character is ‘M’ or ‘m’ then the message is “Individual is married”

if the character is ‘D’ or ‘d’ then the message is “Individual is divorced”

if the character is ‘W’ or ‘w’ then the message is “Individual is widowed”

otherwise, the message is “An invalid code was entered”.

(Hint: use *switch* statement).

1. Write and run a program that gives the user only three choices: convert from Fahrenheit to Celsius, convert from Celsius to Fahrenheit, or quit. If the third choice is selected, the program stops. If one of the first two choices is selected, the program should prompt the user for either a Fahrenheit or Celsius temperature, as appropriate, and then compute and display a corresponding temperature. Use the conversion formulas:

**F = (9 / 5) . C + 32**

**C = (5 / 9) . (F - 32)**

1. Write a program to calculate the number of results obtained when solving the quadratic equation: ax2 + bx + c =0 with given real inputs *a*, *b*, and *c*.
2. Write a program to find the largest number among three numbers using if, if else and nested if else statements.
3. Write a program to check whether a year (integer) entered by the user is a leap year or not.
4. Write a program to check whether a number entered by the user is even or odd.
5. Write a program to check to check whether a given number is positive or negative.
6. Write a program to check whether a Triangle is Equilateral, Isosceles or Scalene