**HOMEWORK 6: CS 102 – SECTION 1**

**FALL 2024**

**DUE DATE: 10/10/2024**

*Problems 3, 4 and 5 are complete programs and must be done using computer and attach separate program files (.cpp files) for each of them.*

*Answers to problems and 2 can be done using the word document. So attach four files: The word document and 3 different program files. Each program must contain the results (code output) below the program using Block comment statements.*

1. Predict the output from the following program segment (without running the code) for each value of variable N as given:

Must show your work by evaluating the expression first.

int N;

cout << ‘Enter a value for N: “;

cin >> N;

switch (N % 5)

{

case 0:

cout << “Good Evening” ;

break;

case 3:

cout << “Hello All” << endl;

case 2:

cout << “Have a nice break!” << endl;

break;

case 4:

cout << “How are you?” ;

default:

cout << “Good Night” << endl;

}

Given values of N’s are:

1. N = 13
2. N = 4
3. N = 26
4. N = 52
5. N = 65

Ans:

The output of N = 13 is 3 it goes on case 3 because N value is 13 and divide by 5 its remaining is 3 so output be Hello All

Have a nice break (due to endl its coming down)

The output of N = 4 is 4 it goes on case 4 because N value is 4 and divide by 5 its remaining is 4 so output be How are you?

The output of N = 26 is 1 it goes on case 3 because N value is 26 and divide by 5 its remaining is 1 so output be Good Night

The output of N = 52 is 2 it goes on case 3 because N value is 52 and divide by 5 its remaining is 2 so output Have a nice break!

The output of N = 65 is 0 it goes on case 3 because N value is 65 and divide by 5 its remaining is 0 so output be Good Evening

1. Predict the output from the following program segment.

int x = 15;

int y = 3;

if (x + y > 17 || y – x < 20)

{

y = x – y;

x = y + x;

cout << x << “ “ << y << “ “ << x + y << “ “ << y – x << endl;

}

else

{

x = y – x + y % 5;

cout << x << “ “ << y << “ “ << x + y << “ “ << y – x << endl;

}

Ans: The output be 27 12 39 -15

1. Write a program that can be used to check if a given year is a leap year or not, and then set number of days (days) to 366 if it is a leap or 365 if it is not a leap year. The only input to the program is the value of the variable **year.**

The algorithm to check if the year is leap year or not is given as below. You can use a Boolean variable **IsLeapYear** to store the result is a leap year or not.

* Check if the year is divisible by 4 but not divisible by 100 then set IsLeapYear to true
* Otherwise, check if the year is divisible by 400 then set IsLeapYear to true
* Otherwise, set IsLeapYear to false

Now check the value of IsLeapYear, if it is true set days t0 366 and display that the year is a leap year and also the value of no. of days,

otherwise set days to 365 and display that the year is not a leap year and also display the number of days.

1. Write a program that can be used for a bank transaction.

Ask the customer’s name and account number (assume account number is a 6 digit integer number)

Ask the starting balance info and store in the variable balance.

Assuming only three different types of transaction, deposit, withdraw and checking account info possible. Ask the customer what type of transaction is requested, type D or d for deposit, W or w for withdrawing and type A or a for account balance, store this info in a suitable variable (call it transType)

Now design a switch statement using transType as the controlling variable, and design three cases and a default case:

For case ‘A’ or ‘a’, display the existing balance

For case ‘D’ or ‘d’, first ask the user to enter the deposit amount, and then add the deposit amount to the existing balance and update the existing balance, this can be done as

balance = balance + depositAmount

Also display the new balance

For case ‘W’ or ‘w’, ask for the withdraw amount and then do the following check

Check if withdraw amount is less than or equal to (balance – 200) (assuming 200 dollars minimum balance is kept in the account), then reduce the withdraw amount from the balance, as balance = balance – withdrawAmount, if not, let the user know how much the existing balance is and maximum amount user can draw is balance – 200

Display the balance even in this case.

Finally, the default case, display that it is a not valid transaction.

1. Write a program that calculates a customer’s bill for a local cable company. There are two types of customers: residential and business. Hence there are two different rates for calculating a cable bill: one for the residential customer and one for the business customer.

For the residential customers, the following rates apply.

* Bill Processing Fee: $5.50
* Basic Service Fee: $20.50
* Premium channel Fee: $7.50 per channel

For the business customers, the following rates apply.

* Bill Processing Fee: $15.00
* Basic Service Fee: $75.00 for first 10 connections, $5.00 for each additional connections
* Premium channel fee: $50.00 per channel, for any number of channels.

The program should ask the user for an account number (an integer) and a customer code. Assume R or r stands for residential customer and B or b for business customer.

Input: The customer account number, customer code, number of premium channels to which the user subscribes and in case of business customers, number of basic service connections.

Output: Customer’s account number and the billing amount.