Programming Fundamentals

Lecture 5

Aamina Batool

Conditional Operator (?:)

- Conditional operator (`?:`) takes three arguments (ternary)
- Syntax for using the conditional operator:

```
expression1 ? expression2 : expression3
```

- If `expression1` is `true`, the result of the conditional expression is `expression2`. Otherwise, the result is `expression3`

Conditional Operator (?:)

```
if(a>=b)
  Max=a;
else
  Max=b;
**********************
Max=(a>=b)?a:b;
```

Exercise 1

- *intX= 0;*
- intZ = 1;
- *cin>>X;*

What is output of above program if input is

a) X is 3
b) X is 4
c) X is 2

- cout<< Z;

Exercise 1

- *intX= 0;*
- intZ = 1;
- *cin>>X;*

- if (X <4)
- {
  - Z = 3;

- }

- cout<< Z;

What is output of above program if input is

a) X is 3
b) X is 4
c) X is 2

Exercise 1

```
intX= 0;
intZ = 1;
cin>>X;

if (X <4)
{
    Z = 3;
    if (X == 3 )
        Z = 2;
}

cout<< Z;
```

What is output of above program if input is

a) X is 3
b) X is 4
c) X is 2

Exercise 2

- *intX, Y, Z = 1;*
- cin>>X ;
- cin>> Y;

- if (X == 3)
- {
  - if (Y >X)
    - Z = 4;
  - else
    - Z = 5;
- }
- cout<<Z;

What is output of above program if input is

X is 3 and Y is 4
X is 3 and Y is 2
X is 2 and Y is 3

Exercise 3

```
intX= 0;
intZ = 1;
cin>>X;
if (X <4 )
{
    Z = 1;
}
else
    {
    if( X == 3 )
        Z = 2;
    else{
        if (X == 4 )
            Z = 3;
        else
            Z = 4;
        }
    }
```

1.What is output of this program if input is

X is 3
X is 4
X is 5

2. For what input in X, the output variable Z is set to 2?

Largest of three Numbers

- Write a code to print largest one of 3 numbers.
- Write a code to print 3 numbers in sorted order.

Squirrel's Play Season

- The squirrels in FAST spend most of the day playing. In particular, they play if the temperature is between 20 and 30 (inclusive). Unless it is summer, then the upper limit is 35 instead of 30. Write Pseudocode which asks for the temperature and the season, and prints "True" if the squirrels play and "False" otherwise.
- For example:
- If input is : Season=S for Summer
- and Temperature=32
- Output=True.

- char season = NULL;
- Int temperature = 0;
- Cout << “Enter season”;
- cin>> season;
- cout<<“Enter temperature”;
- cin>> temperature;
- bool flag = false;
- if (season == ‘S’)
  - if(temperature >=20 && temperature <=35)
    - flag = true;
- else if (season != ‘S’)
  - if (temperature >=20 && temperature <=30)
    - flag = true;
- cout<< flag;

Exercise 4

- ***Problem***: *Take input Count and Output Count only when count is greater than 0 and count is less than10.*

- *Int count= 0;*
- cin>> count ;
- if (count < 10)
- {
  - if (count > 0)
    - cout<<count;
- }

Using AND

- *Int count= 0;*
- Cin >> count ;
- if (count < 10 && count>0)
- {
  - cout<<count;
- }

Exercise 5

- ***Problem***: *take input Count and Output Count only when count is greater than 10 or count is equal to 5.*

- *Int count= 0;*
- Cin >> count ;
- if (count >10)
  - cout<<count;
- else if (count ==5)
  - cout<< count;

Using OR

- *Int count= 0;*
- Cin >> count ;
- if (count >10 || count == 5)
- {
  - cout<<count;
- }

Leap Years

- Leap years have 366 days (29 days in February). Any year that is divisible by 4 but not by 100 is a leap year. If a year is divisible by 400 then it is also a leap year.
- So in short any year that is divisible by 4 is a leap year, unless it is divisible by 100, in which case it must also be divisible by 400 for it to be a leap year.
- Example: 1996 and 2000 were leap years, but 1900 was not.
- Write a pseudo-code to determine if a year input by a user is a leap year or not

Rock, Paper , Scissors

- Write and run a program that plays the game of “Rock, paper, scissors.” In this game, two players simultaneously say (or display a hand symbol representing) either “rock,” “paper,” or “scissors.” The winner is the one whose choice dominates the other..
- The rules are: paper dominates (wraps) rock, rock dominates (breaks) scissors, and scissors dominate (cut) paper.
- You can use 1 = rock, 2 = paper, 3 = scissors
- Sample Input: 1 1
- Sample Output: Draw
- Sample Input: 1 2
- Sample Output: 2nd player wins

References

1. C++ Programming: From Problem Analysis to Program Design, Third Edition
2. https://www.just.edu.jo/~yahya-t/cs115/