Lab 04 – Selection

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Q1 – Sort three integers

Program Sort3

File name: lab04\Sort3.java

Purpose: To sort and display in ascending order three integer values entered by the user.

Packages: package lab04
import java.util.Scanner.

Limitations: Double or float values.

Input: Integers *a*, *b*, and *c*.

Output: *a*, *b*, and *c*. In ascending order.

Pseudocode:

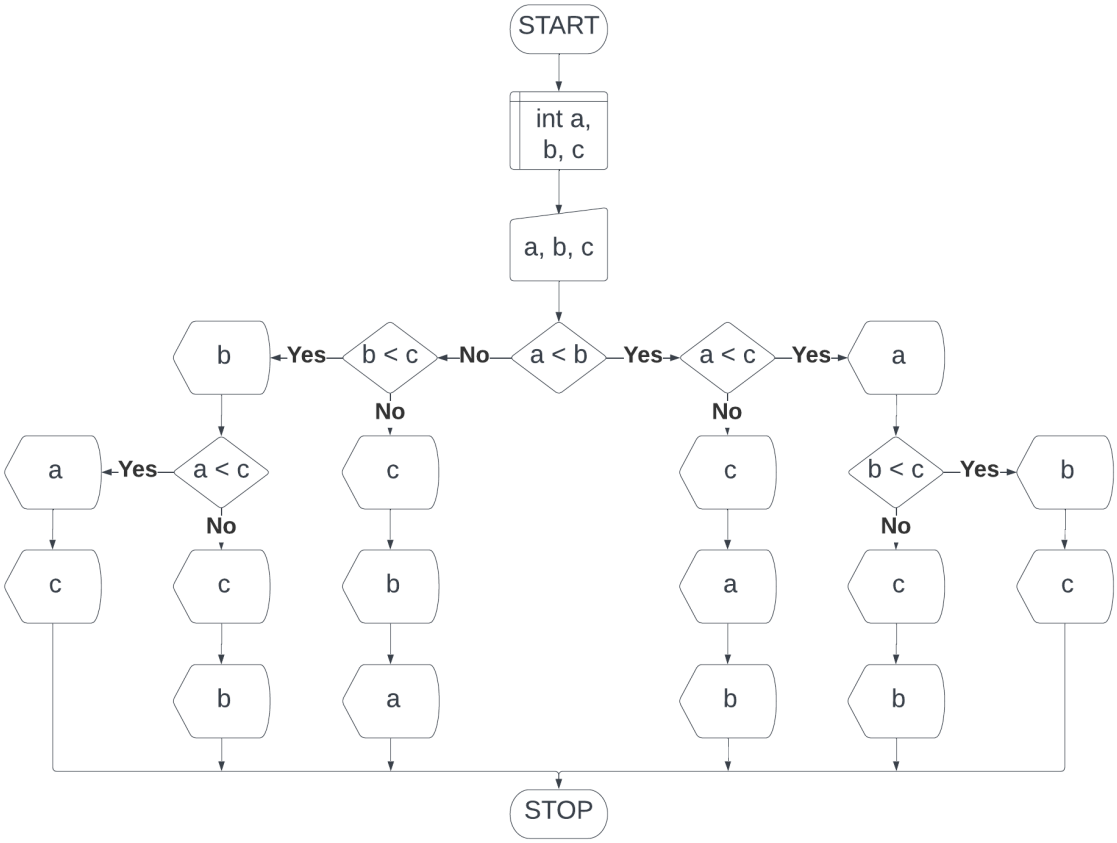
Algorithm (program name)
START

1. Declare three integer variables (*a*, *b*, and *c*).
2. Input values for each variable from the user.
3. If *a* < *b* then:
    a. If *a* < *c* then:
        i. Print *a*.
        ii. If *b* < *c* then:
            1. Print *b*.
            2. Print *c*.
        iii. Else:
            1. Print *c*.
            2. Print *b*.
    b. Else:
        i. Print *c*.
        ii. Print *a*.
        iii. Print *b*.
4. Else:
    a. If *b* < *c* then:
        i. Print *b*.
        ii. If *a* < *c* then:
            1. Print *a*.
            2. Print *c*.
        iii. Else:
            1. Print *c*.

2. Print *a*.

b. Else:
   i. Print *c*.
   ii. Print *b*.
   iii. Print *a*.

END (program name)



Q2 – Use logical operator

Program LogicalOps

File name: lab04\LogicalOps.java

Purpose: To determine whether a value entered by the user is divisible by 5 **and** 6, also if it's divisible by 5 **or** 6, and if it's divisible by 5 **or** 6 but **not both**.

Packages: package lab04
import java.util.Scanner

Limitations: Double or float values.

Input: Integer num.

Output: Three strings, each with Boolean values for each condition:

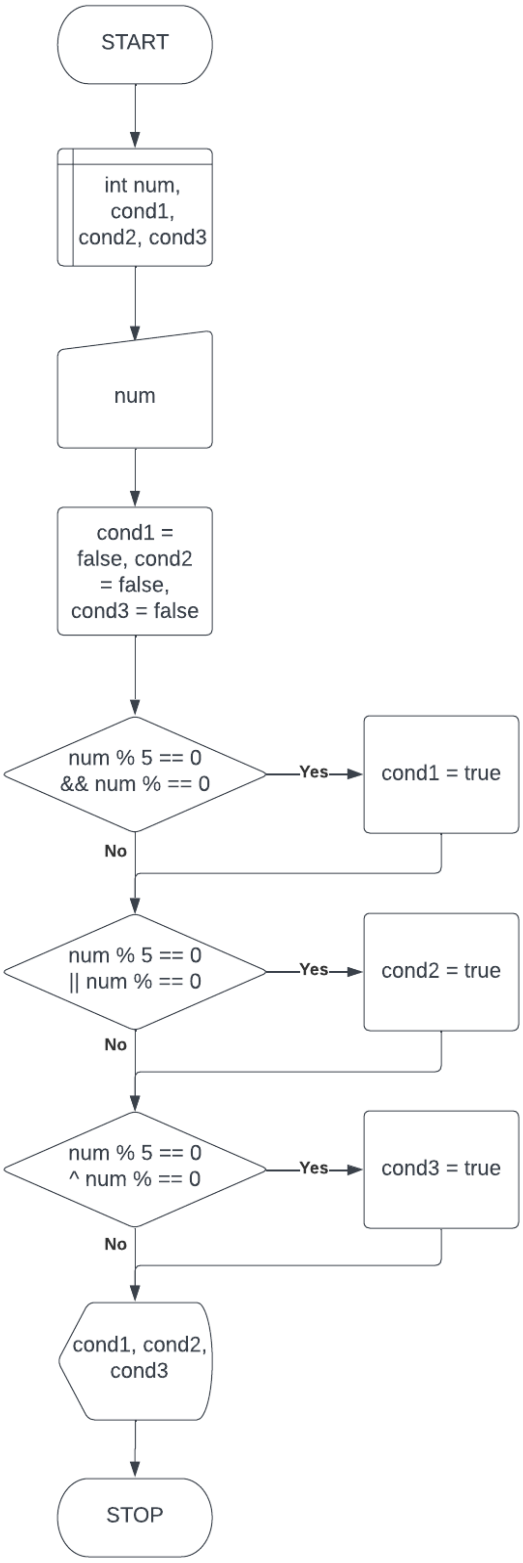
5 and 6 (*cond1*),
5 or 6 (*cond2*),
5 or 6 but not both (*cond3*).

Pseudocode:

Algorithm (program name)
START

1. Declare the variables:
    a. Int *num*,
    b. Boolean *cond1*, *cond2*, *cond3*.
2. Initialize Boolean variables to *false*.
3. Prompt user to input *num*.
4. If *num* is divisible by 5 **and** 6, then:
    a. *cond1* is *true*.
5. If *num* is divisible by 5 **or** 6, then:
    a. *cond2* is *true*.
6. If *num* is divisible by 5 **or** 6 but **not both**, then:
    a. *cond3* is *true*.
7. Display text with *cond1*.
8. Display text with *cond2*.
9. Display text with *cond3*.

END (program name)


START
int num, cond1, cond2, cond3
num
cond1 = false, cond2 = false, cond3 = false
num % 5 == 0 && num % == 0
Yes
cond1 = true
No
num % 5 == 0 || num % == 0
Yes
cond2 = true
No
num % 5 == 0 ^ num % == 0
Yes
cond3 = true
No
cond1, cond2, cond3
STOP

Q3 – Game – Rock, Scissor, Paper

Program RSPGame

File name: lab04\RSPGame.java

Purpose: To have the user play rock, scissor, paper with the computer.

Packages: package lab04
java.lang.Math
java.util.Scanner

Limitations: Double type input.
Float type input.
Integers not between the 0 and 2 range.

Input: Integer *userNum*.

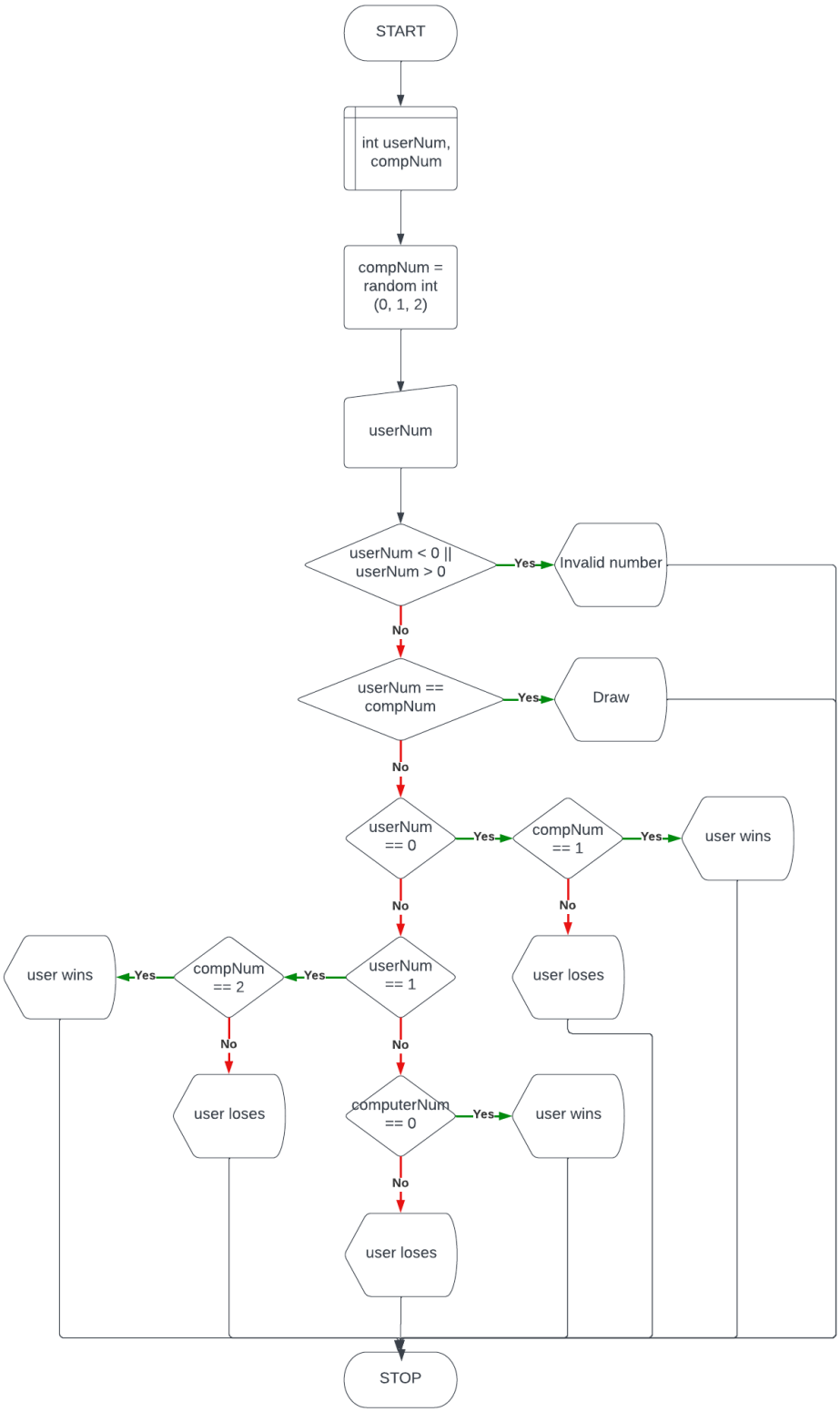
Output: String output with the result of the game.

Pseudocode:

Algorithm (program name)
START

1. Declare variables *userNum* and *compNum*.
2. Assign *compNum* a random number between 0 and 2.
3. Prompt the user to enter a value between 0 and 2 and assign to *userNum*.
4. If userNum < 0 or userNum > 2 then:
    a. Error, invalid number message.
    b. If *userNum* = *compNum* then:
        i. Print **draw**.
    c. Else:
        i. If *userNum* = 0 then
            1. If *compNum* = 1 then
                a. Print **user wins**.
            2. Else:
                a. Print **user loses**.
        ii. Else:
            1. If *userNum* = 1 then:
                a. If *compNum* = 2 then:
                    i. Print **user wins**.
                b. Else:
                    i. Print **user loses**.
            2. Else
                a. If *compNum* = 0 then:
                    i. Print **user wins**.
                b. Else:
                    i. Print **user loses**.

END (program name)


START
int userNum, compNum
compNum = random int (0, 1, 2)
userNum
userNum < 0 || userNum > 0
Yes
Invalid number
No
userNum == compNum
Yes
Draw
No
userNum == 0
Yes
compNum == 1
Yes
user wins
No
No
user wins
Yes
compNum == 2
Yes
userNum == 1
user loses
No
No
user loses
computerNum == 0
Yes
user wins
No
user loses
STOP