FIJI NATIONAL UNIVERSITY

COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION SYSTEMS

CSC511 - INTRODUCTION TO C++

TUTORIAL 3 – CONDITIONAL STATEMENTS

1. Determine the value of the following expressions, assuming a = 5, b = 2, c = 4, d = 6, and e = 3:

   a. a > b
   b. a != b
   c. d % b == c % b
   d. a * c != d * b
   e. d * b == c * e
   f. !(a * b)
   g. !(a % b * c)
   h. !(c % b * a)
   i. b % c * a

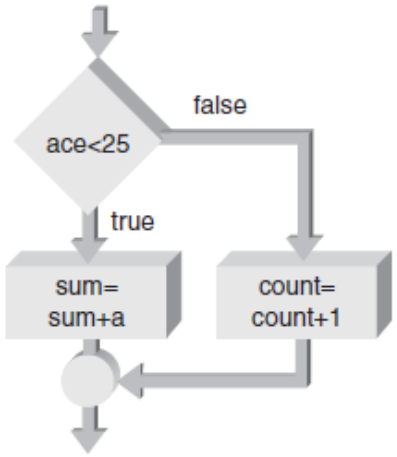
2. Write relational expressions to express the following conditions (using variable names of your choosing):
   a. The distance is equal to 30 feet.
   b. A speed is 55 mph.
   c. The current month is 12 (December).
   d. The letter input is K.
   e. A length is greater than 2 feet and less than 3 feet.
   f. The current day is the 15th day of the 1st month.
   g. The automobile's speed is 35 mph and its acceleration is greater than 4 mph per second.
   h. An automobile's speed is greater than 50 mph and it has been moving for at least 5 hours.
   i. The code is less than 500 characters and takes more than 2 microseconds to transmit.

3. Determine the value of the following expressions, assuming a = 5, b = 2, c = 4, and d = 5:
   a. a == 5
   b. b * d == c * c
   c. d % b * c > 5 || c % b * d < 7

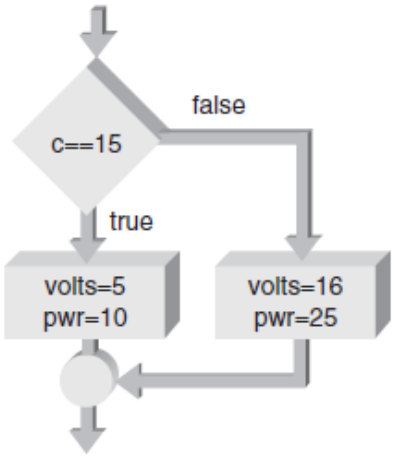
4. Write appropriate if statements for the following conditions:
   a. If an angle is equal to 90 degrees, print the message "The angle is a right angle"; else, print the message "The angle is not a right angle."
   b. If the temperature is above 100 degrees, display the message "above the boiling point of water"; else, display the message "below the boiling point of water."
   c. If the number is positive, add the number to the variable positivesum; else, add the number to the variable negativesum.
   d. If the slope is less than 0.5, set the variable flag to 0; else, set flag to 1.
   e. If the difference between volts1 and volts2 is less than 0.001, set the variable approx to 0; else, calculate approx as the quantity (volts1 - volts2) / 2.0.
   f. If the frequency is above 60, display the message "The frequency is too high."
   g. If the difference between temp1 and temp2 exceeds 2.3, calculate the variable error as (temp1 - temp2) * factor.
   h. If x is greater than y and z is less than 20, request that the user input a value for the variable p.
   i. If distance is greater than 20 and less than 35, request that the user input a value for the variable time.

5. Write if statements corresponding to the conditions illustrated in the following flowcharts:

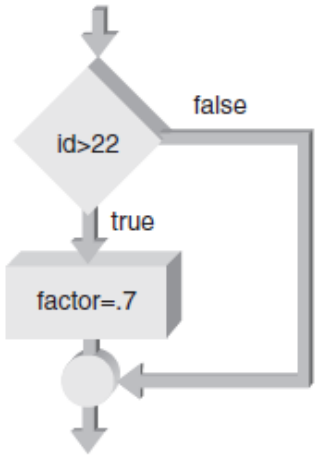
a.



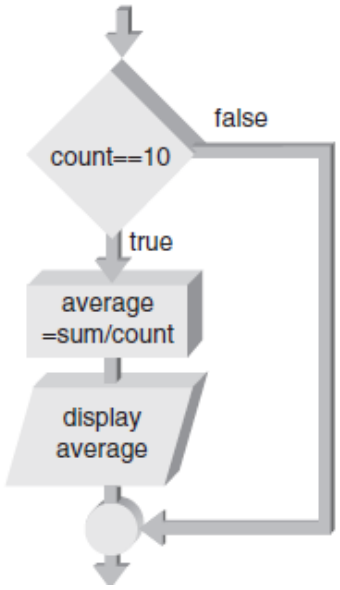
b.



c.



d.

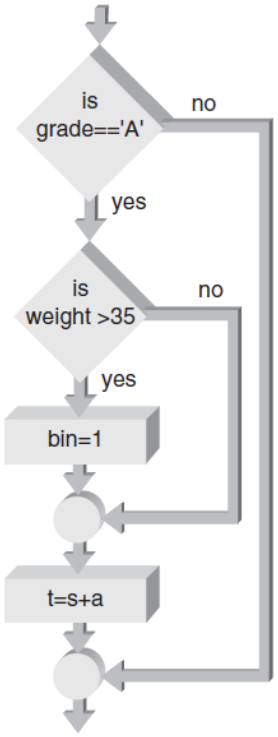


6. Write a C++ program that asks the user to input two numbers. If the first number entered is greater than the second number, the program should print the message "The first number is greater"; else, it should print the message "The first number is smaller." Test your program by entering the numbers 5 and 8 and then using the numbers 11 and 2. What do you think your program will display if the two numbers entered are equal? Test this case.

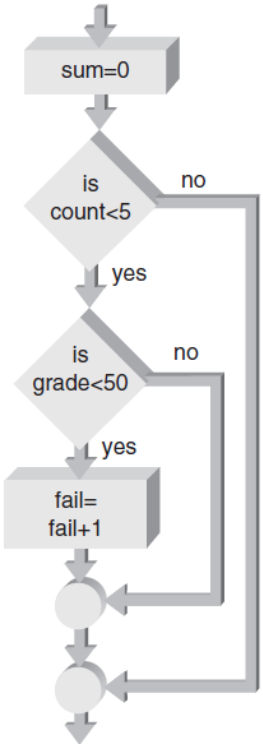
7. Write a C++ program to display the message "PROCEED WITH TAKEOFF" or "ABORT TAKEOFF," depending on the input. If the character g is entered in the variable code, the first message should be displayed; otherwise, the second message should be displayed.

8. Write nested if statements corresponding to the conditions illustrated in the following flowcharts:

a.



b.



9. The grade level of undergraduate college students is typically determined according to the following schedule:

Number of Credits Completed	Grade Level
Less than 32	Freshman
32 to 63	Sophomore
64 to 95	Junior
96 or more	Senior

Using this information, write a C++ program that accepts the number of credits a student has completed, determines the student's grade level, and displays the grade level.

10. Rewrite the following if-else chain by using a switch statement:

```
if (factor == 1)
  pressure = 25.0;
else if (factor == 2)
  pressure = 36.0;
else if (factor == 3)
  pressure = 45.0;
else if (factor == 4) || (factor == 5) || (factor == 6)
  pressure = 49.0;
```

11. Write a program that accepts two real numbers and a select code from a user. If the entered select code is 1, have the program add the two previously entered numbers and display the result; if the select code is 2, the numbers should be multiplied; and if the select code is 3, the first number should be divided by the second number.

12. A senior engineer is paid $2500 a week, and a junior engineer, $1250 a week. Write a C++ program that accepts as input an engineer's status in the character variable status. If status equals S, the senior engineer's salary should be displayed; otherwise, the junior engineer's salary should be displayed.