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Programming Assignment: Short Circuit Evaluation

Problem description:
Short circuit evaluation is the semantics of boolean operators in which the second argument is evaluated if and only if the first argument is true. When the first argument of the AND function is false, we skip the second argument and evaluate the whole statement to false. In this programming assignment, I write programs in C, Fortran, java, Python in order to see if the language implementation of these languages stated above has short circuit evaluation.

4 programs you ran with the output attached (C, Fortran, Java, Python)

1. **C**

Program:

Open | program.c ~/CS471/Assignment2 | Save

```c
#include<stdio.h>

int a() {
        printf("a is 1\n");
        return 1;
}

int b() {
        printf("b is 2\n");
        return 2;
}

int main() {
        int i = 1;
        if(a()&& b()) {
                printf("True. a and b are evaulated\n");
        }
        else {
                printf("False. a and b are not evaluated\n");
        }
}
```

Output:

Terminal

File Edit View Search Terminal Help

```
Assignment2/C> gcc -o program program.c
Assignment2/C> ./program
a is 1
b is 2
True. a and b are evaulated
Assignment2/C>
```

2. Fortran:

Program:

circuit.f
~/CS471/Assignment2/Fortran

```
subroutine number(num)
        num = 3
        print *,"num is evaluated ",num
end subroutine number

program circuit
        implicit none

        integer:: year
        integer:: result

        year = 2016

        call number(result)
        if(year==2017 .AND. result==3) then
                print *,"year=",year
                print *,"result",result
                print *,"True"

        else
                print *,"year   =",year
                print *,"result =",result
                print *,"False"
        end if

end program
```

Output:

Terminal

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```
Assignment2/Fortran> ./circuit
 num is evaluated           3
 year   =        2016
 result =           3
 False
Assignment2/Fortran>
```

3. Java:

Program:

Open program.java ~/CS471/Assignment2/Java Save

```java
public class program {
        public static int a() {
                System.out.println("a is evaluated");
                return 1;
        }

        public static int b() {
                System.out.println("b is evaluated");
                return 2;
        }

        public static void main(String[] args) {
                boolean eval = a()==b();
                int num = 12;
                if(eval && num==12) {
                        System.out.println("True");
                }
                else {
                        System.out.println("False");
                }
        }
}
```

Output:

```
Terminal
File  Edit  View  Search  Terminal  Help
Assignment2/Java> java program
a is evaluated
b is evaluated
False
Assignment2/Java>
```

4. Python:

Program:

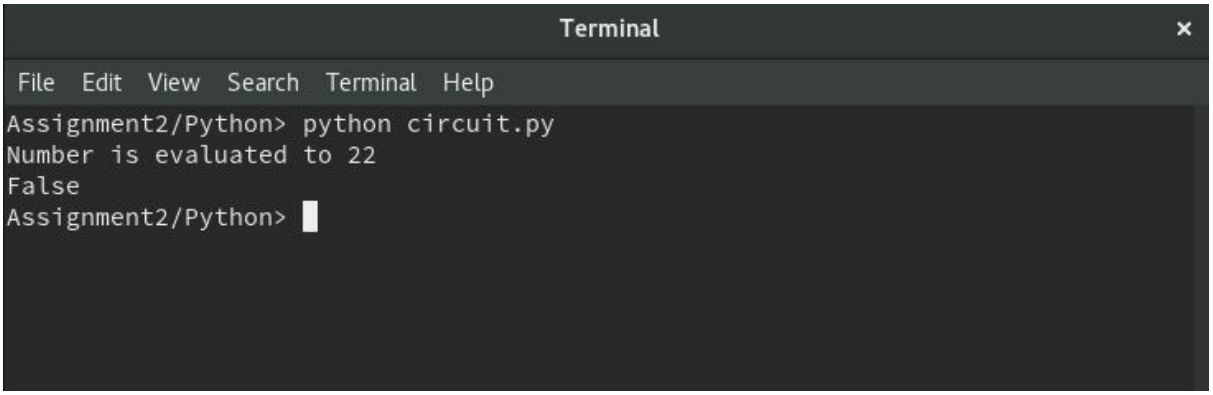
Open circuit.py ~/CS471/Assignment2/Python Save

```python
def number(n):
        print "Number is evaluated to %d" %n
        return n

csClass = 471
age = number(22)

if age==21 and csClass==471:
        print "True "
else:
        print "False"
```

Output:



Summary of the results in tabular form of experiments

Programming Languages	Support short circuit evaluation? (Yes/No)
C	Yes
Fortran	Yes
Java	Yes
Python	Yes