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Date: 09 / 29 / 2022
Lab: 2

Programming #2 – Short Circuit Evaluation

Problem Description: Testing several languages to see if the language implementation has Short Circuit Evaluation in the **AND** Boolean construct.

Experiment Code:

1. I have made a function f () in all four cases, whose return value is true. This function is used to check short circuit.
2. There is also a variable i = 1, initialized for every code.
3. If you change the value of i in the if () condition, you will notice some program evaluates the function f () and some does not. Below is the summary table of the experiments.

Summary table:

Language	Short Circuit Experiment result with AND operator
ADA	**and**: No Short-circuit **and then**: Short-circuit happens [In ADA, and then is the short circuit form of the and operator] **Code:** p2ada.adb
Kshell	**&&**: Short-circuit happens **Code**: p2ksh.ksh
PHP	**&&/and**: Short-circuit happens **Code**: p2php.php
PERL	**&&/and**: Short-circuit happens **Code**: p2perl.pl

Output: Below are the code and their respective output in screenshot form.

Code for ada program:

```
-- Name: Pratyay Kumar
-- Date: 09/29/2022
-- Lab: 2
-- Purpose: To test if the language implementation has short circuit evaluation in AND
Boolean construct.
-- Program Description: This problem calls function f, with && operator, and checks if
short circuit happens or not.
with Text_IO;
use Text_IO;

procedure p2ada is
        --Declared the variable
        i : Integer;

        -- Function: f
        -- Description: function f is used to check short-circuit.
        -- Param: NIL
        function f return Boolean is
        begin
                Put_line ("I have been evaluated");
                return true;
        end f;
begin
        i := 1;

        --Here, short circuit happens if i = 0.
        --if i = 0 and then f then
        if i = 0 and f then
                Put_line ("True");
        else
                Put_line ("False");
        end if;
end p2ada;
```

Output for the above code:

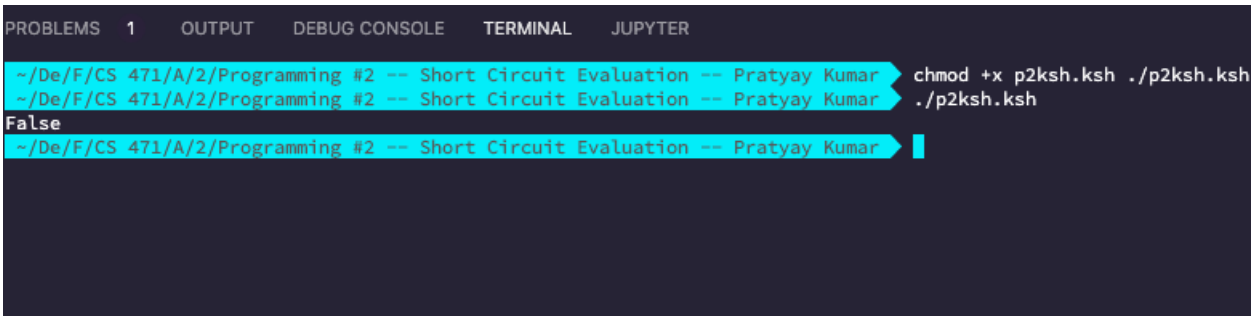
```
pkumar@kaiju:~> gnatmake p2ada.adb
gnatmake: "p2ada" up to date.
pkumar@kaiju:~> ./p2ada
I have been evaluated
False
pkumar@kaiju:~>
```

The above output is Screenshot contains the **output of ADA program**.

Code for Kshell program:

```
# Name: Pratyay Kumar
# Date: 09/29/2022
# Lab: 2
# Purpose: To test if the language implementation has short circuit evaluation in AND Boolean construct.
# Program Description: This problem calls function f, with && operator, and checks if short circuit happens or not.

#!/bin/ksh

# Function: f
# Description: function f is used to check short-circuit.
# Param: NIL
f () {
    echo "I have been evaluated"
    return 0
}

#Declared the variable
i=1

#Here, short circuit happens if $i -eq 0.
if [ $i -eq 0 ] && f; then
        echo "True"
else
        echo "False"
fi
```

Output for the above code:



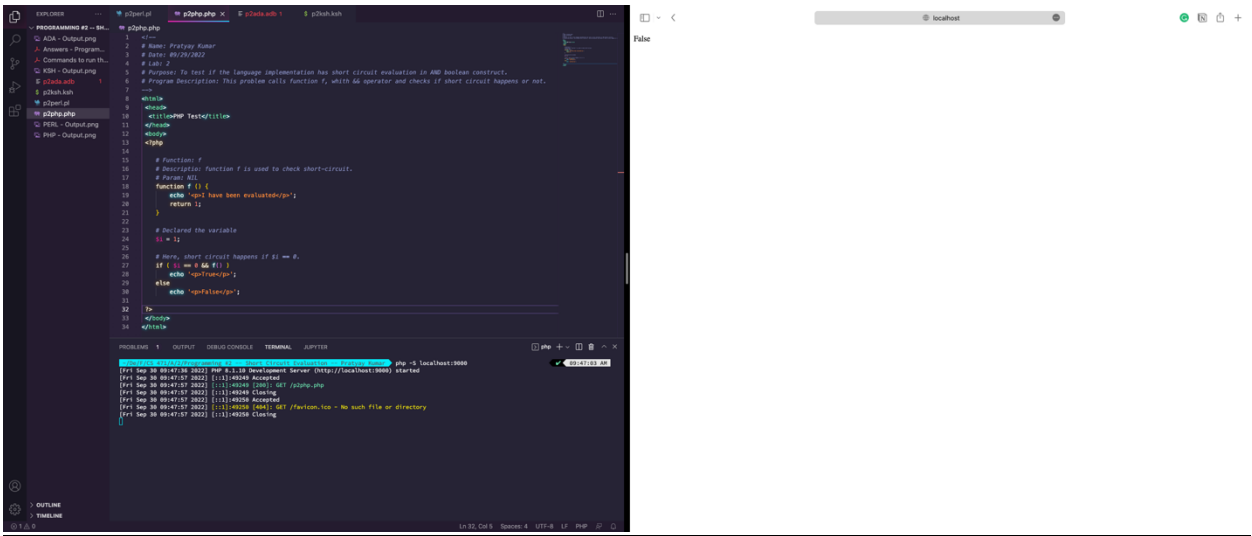
The above Screenshot contains the output of **Korn Shell (Kshell** program).

Code for PHP program:

```
<!--
# Name: Pratyay Kumar
# Date: 09/29/2022
# Lab: 2
# Purpose: To test if the language implementation has short circuit evaluation in AND
boolean construct.
# Program Description: This problem calls function f, with && operator, and checks if
short circuit happens or not.
-->
<html>
 <head>
  <title>PHP Test</title>
 </head>
 <body>
 <?php

    # Function: f
    # Description: function f is used to check short-circuit.
    # Param: NIL
    function f () {
        echo '<p>I have been evaluated</p>';
        return 1;
    }

    # Declared the variable
    $i = 1;

    # Here, short circuit happens if $i == 0.
    if ( $i == 0 && f() )
        echo '<p>True</p>';
    else
        echo '<p>False</p>';

 ?>
```

```
 </body>
</html>
```

Output for the above code:



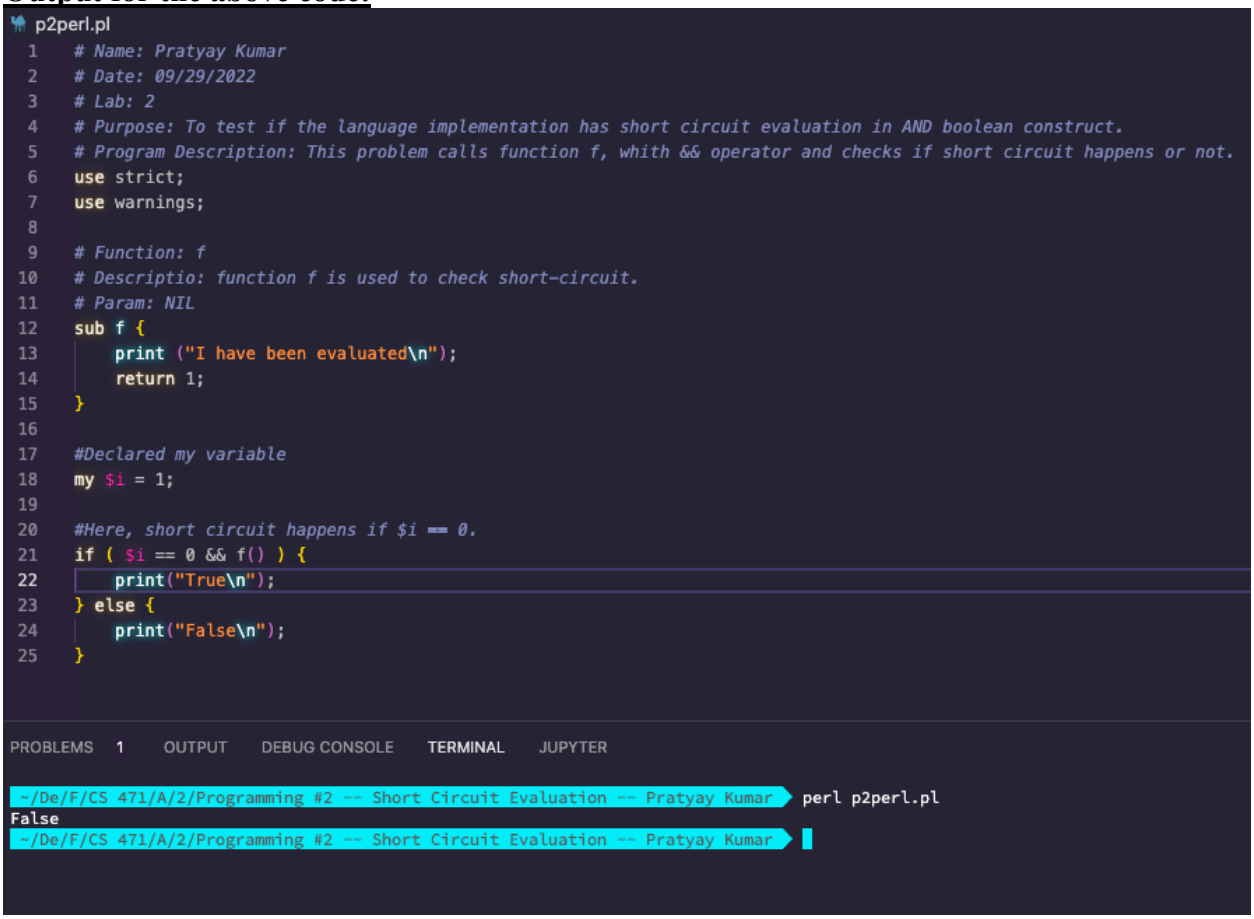
The above Screenshot contains the **code** of **PHP program** and the **output**. On the left-hand side, I have started the localhost server, and on the right-hand side the local host URL is opened, which is '**localhost:9000/p2php.php**'

Code for PERL program:

```
# Name: Pratyay Kumar
# Date: 09/29/2022
# Lab: 2
# Purpose: To test if the language implementation has short circuit evaluation in AND
boolean construct.
# Program Description: This problem calls function f, with && operator, and checks if
short circuit happens or not.
use strict;
use warnings;

# Function: f
# Description: function f is used to check short-circuit.
# Param: NIL
sub f {
    print ("I have been evaluated\n");
    return 1;
}

#Declared my variable
my $i = 1;
```

```
#Here, short circuit happens if $i == 0.
if ( $i == 0 && f() ) {
    print("True\n");
} else {
    print("False\n");
}
```

Output for the above code:



The above output is Screenshot containing the **code** of **PERL program** and the **output**.