ENGF0002 (Design and Professional Skills)
Scenarios

This document focuses on the differences in conditional statements between the three prototypes of the programming language. It follows an observation-explanation-conclusion structure in that an observation is laid down, explained, and a theory is formulated it out of it.

Classifier-1

```
#lang Conditionals

block:
  if (0):
    print("executes if statement")
  else:
    print("executes else statement")
  end
end
```

```
Welcome to DrRacket, version 7.0 [3m].
Language: Conditionals, with debugging; memory limit: 128 MB.
version: 2018-09-04T22:54:09-04:00

------Core 1------

"executes else statement"

------Core 2------

"executes if statement"

------Core 3------

ERROR: The condition for an "if" expression must be a boolean.
```

Observation-1: When an if-statement has a zero-value condition , then Core-1 executes the block of code in *else*, while Core-2 executes the block of code in *if*. Core-3 simply prints out an error and does not compile.

Theory-1: This indicates that Core-1 treats 0 as a false boolean value and hence, executes the block of code in *else,* whereas Core-2 treats 0 as an integer and assumes that it is true; executing the block of code in *if*. Core-3, however, checks the type of the value passed and reports an error since it is not boolean. Therefore, Core-1 and Core-2 do not check the type of the value in the if-condition, while Core-3 does.

Partition after test: {Core 1}, {Core 2}, {Core 3}

```
#lang Conditionals
block:
  if (1):
    print("executes if block")
  else:
    print("executes else block")
  end
end

block:
  if (7):
    print("executes if block")
  else:
    print("executes else block")
  end
end

block:
  if (-26.9):
    print("executes if block")
  else:
    print("executes else block")
  end
end
```

```
Welcome to DrRacket, version 7.0 [3m].
Language: Conditionals, with debugging; memory limit: 128 MB.
version: 2018-09-04T22:54:09-04:00

-------Core 1-------

"executes if block"
"executes if block"
"executes if block"

-------Core 2-------

"executes if block"
"executes if block"
"executes if block"

-------Core 3-------

ERROR: The condition for an "if" expression must be a boolean.
```

Observation-2: When any real number- except zero- is passed as a condition to an if-statement, Core-1 and Core-2 always execute the block of code in *if*, while Core-3, again, prints an error and expects a boolean value.

Theory-2: When any number (except zero) is passed as a condition, then Core-1 and Core-2 take it as to be *true* and simply execute the block of code in *if*, without reporting any errors.
Example- if(1) {..}
*   - if(-26.9) {..}*

However, Core-3, again, does not compile and reports an error.

Partition after test: {Core 1, Core 2}, {Core 3}

Abir

<u>Classifier-3</u>

```
#lang Conditionals
block:
  if (""):
    print("executes if block")
  else:
    print("executes else block")
  end
end

block:
  if (" "):
    print("executes if block")
  else:
    print("executes else block")
  end
end

block:
  if ("Lorem Ipsum Dolor"):
    print("executes if block")
  else:
    print("executes else block")
  end
end
```

Welcome to DrRacket, version 7.0 [3m].
Language: Conditionals, with debugging; memory limit: 128 MB.
version: 2018-09-04T22:54:09-04:00

------Core 1------

"executes else block"
"executes if block"
"executes if block"

------Core 2------

"executes if block"
"executes if block"
"executes if block"

------Core 3------

ERROR: The condition for an "if" expression must be a boolean.

Observation-3: When an empty string is passed as a condition to an if-statement, Core-1 executes the block of code in *else*, while Core-2 executes the block of code in *if*. Core-3, on the other hand, reports an error again and does not compile.

Theory-3: With an empty string, Core-1 assumes the if-statement to be incomplete and hence, executes the else statement. Core-2 takes the value to be true; printing out the else block. Core-3, however, as we learned earlier always checks the type passed into the if-condition block and reports an error.

Partition after test: {Core 1}, {Core 2}, {Core3}

Observation-4: When any string (except the empty string) is passed to the if-statement as a condition, Core-1 and Core-2 execute the if block, while Core-3 reports an error.

Theory-4: When any string (except the empty string) is passed as a condition, then Core-1 and Core-2 take it as to be *true* and simply execute the block of code in *if*, without reporting any errors.
Example- if("Lorem Ipsum Dolor") {..}
        - if(" ") {..}

However, Core-3, again, does not compile and reports an error.

Partition after test: {Core 1, Core 2}, {Core 3}

Abir