# 1 Different types of algorithm styles

**Algorithm 1** Put your caption here

```
1: procedure NAME(a, b)
2:     System Initialization
3:     Read the value
4:     if condition = True then
5:         Do this
6:         if Condition ≥ 1 then
7:             Do that
8:         else if Condition ≠ 5 then                ▷ Place the comment here
9:             Do another
10:            Do that as well
11:        else
12:            Do otherwise
13:    while something ≠ 0 do                        ▷ put some comments here
14:        var1 ← var2                                          ▷ another comment
15:        var3 ← var4
```

**Example of Factorial of a number**

**Algorithm 2** Find the factorial of a number

```
1: procedure FACT(n)
2:     Start
3:     Read n
4:     Fact ← 1
5:     i ← 1
6:     while i ≤ n do
7:         Fact = Fact ∗ i
8:         i = i + 1
9:     Display Fact
10:    Stop
```

# 1 Examples algorithm or pseudocode style and statements using algorithemic environment by algpseudocode pakage

## List of Algorithms



### 1.1 If-then-else example without caption

$i \leftarrow 10$
**if** $i \geq 5$ **then**
    $i \leftarrow i - 1$
**else**
    **if** $i \leq 3$ **then**
        $i \leftarrow i + 2$
    **end if**
**end if**

### 1.2 If-then-else example with caption

**Algorithm 1** An algorithm with caption

$i \leftarrow 10$
**if** $i \geq 5$ **then**
    $i \leftarrow i - 1$
**else**
    **if** $i \leq 3$ **then**
        $i \leftarrow i + 2$
    **end if**
**end if**

**Algorithm 2** Example algorithm for use of while condition with caption

**Require:** Write here the required data
**Ensure:** Write here the expected result

```
initialization;
while While condition do
    instructions;
    if condition then
        instructions1;
        instructions2;
    else
        instructions3;
    end if
end while
```

**Algorithm 3** An algorithm with caption

**Require:** $n \geq 0$
**Ensure:** $y = x^n$

```
y ← 1
X ← x
N ← n
while N ≠ 0 do
    if N is even then
        X ← X × X
        N ← N/2                          ▷ This is a comment
    else if N is odd then
        y ← y × X
        N ← N − 1
    end if
end while
```

# 1 Examples with the algcompatible/algorithmic and algorithm packages

## 1.1 Example with algcompatible package

$i \leftarrow 10$
$i \leftarrow i - 1$

**if** $i \leq 3$ **then**
  $i \leftarrow i + 2$
**end if**

## 1.2 Example ML algorithm with algcompatible package

**Algorithm 1** Pseudocode of New block

**Procedure** $SCR\_Block(input)$ :
$W$, $H$, $C \leftarrow input\_width$, $input\_height$, $input\_channels$
$Y = Relu(conv(input)) \quad \#Numberof filters = C$
$C_{11}, C_{12} \leftarrow Splitting\,the\,input\,X\,into\,two\,groups$
$C_{21}, C_{22} \leftarrow Splitting\,the\,Y\,into\,two\,groups$
$X_{Concat} = C_{11}C_{22},\ Concatenate\,channelwise$
$Y_{Concat} = C_{12}C_{21},\ Concatenate\,channelwise$
$X_{SC} = Relu(conv(X_{Concat}))$
$Y_{SC} = Relu(conv(Y_{Concat}))$
$X_{int} = \sigma\left[Avg\,Pool_{(W\times H)}(X_{SC})\right]$

$Y_{int} = \sigma\left[Avg\,Pool_{(W\times H)}(Y_{SC})\right]$

$X_{Out} = X_{int} \times X_{SC},\ Y_{Out} = Y_{int} \times Y_{SC}$
$Out = X_{Out} + Y_{Out} + input$
**Return** Out
**End procedure**

# 1 Examples with the algorithm2e package

**Example algorithm with to end the statements**

$i \leftarrow 10$;
**if** $i \geq 5$ **then**
  $i \leftarrow i - 1$;
**else**
  **if** $i \leq 3$ **then**
    $i \leftarrow i + 2$;
  **end**
**end**

**Example algorithm with caption and label**

**Data:** $n \geq 0$
**Result:** $y = x^n$
$y \leftarrow 1$;
$X \leftarrow x$;
$N \leftarrow n$;
**while** $N \neq 0$ **do**
  **if** $N$ *is even* **then**
    $X \leftarrow X \times X$;
    $N \leftarrow \frac{N}{2}$ *[r]This is a comment
  **else**
    **if** $N$ *is odd* **then**
      $y \leftarrow y \times X$;
      $N \leftarrow N - 1$;
    **end**
  **end**
**end**

**Algorithm 1:** An algorithm with caption