

# Algorithm Examples

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## 1 Basic Algorithms

### 1.1 Basic Algorithm 01

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**Algorithm 1:** Basic Algorithm 01

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**Input:**  $a, b, c$   
**Result:** Sum  
**Data:** 1, 2, 4

```
1 if  $a > 10$  then
2   | print "a is greater than 10";
3 end
4 else if  $a < 100$  then
5   | print "a is less than 100";
6 end
7 else
8   | print "a is neither greater than 10 nor less than 100";
9 end
10 while  $a > b$  do
11   | print  $a$ ;
12   |  $a \leftarrow a + 1$ ;
13 end
14 for  $int\ a = 10; a < 30; a \leftarrow a + 1$  do
15   | print "Statement 1";
16 end
```

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### 1.2 Basic Algorithm 02

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**Algorithm 2:** Basic Algorithm 02

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**Input:**  $x, y$   
**Result:** Product

```
1  $z \leftarrow x \times y$ ;
2 print  $z$ ;
```

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## 2 Advanced Algorithms

### 2.1 Advanced Algorithm 01

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**Algorithm 3:** Advanced Algorithm 01

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**Input:** array  $A$

**Result:** Sorted array  $A$

```
1 for int  $i = 0; i < \text{length}(A); i \leftarrow i + 1$  do
2   for int  $j = 0; j < \text{length}(A) - 1; j \leftarrow j + 1$  do
3     if  $A[j] > A[j + 1]$  then
4        $\text{swap}(A[j], A[j + 1]);$ 
5     end
6   end
7 end
```

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### 2.2 Advanced Algorithm 02

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**Algorithm 4:** Advanced Algorithm 02

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**Input:** Graph  $G$

**Result:** Shortest path in  $G$

```
1 Use Dijkstra's algorithm to find the shortest path;
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