

# Algorithm2e宏包演示

Help Document for CS101-Introduction to Computer Science, Xiaofeng Gao@SJTU

## 1. If语句及算法模板样例（左侧源代码，右侧样例）：

```
\begin{algorithm}[H]
\KwIn{$x$, $y$}
\KwOut{$sign$}
\BlankLine
\caption{$div(x,y)$} \label{Alg-div}
\If{$rm(x,y)=0$}{
  $sign=1$\;
}
\Else{
  $sign=0$\;
}
\Return{$sign$}\;
\end{algorithm}
```

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**Algorithm 1:**  $div(x, y)$ 

---

**Input:**  $x, y$

**Output:**  $sign$

```
1 if  $rm(x, y) = 0$  then
2 |    $sign \leftarrow 1$ ;
3 else
4 |    $sign \leftarrow 0$ ;
5 end
6 return  $sign$ ;
```

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## 2. If-ElseIf-Else语句样例：

```
\begin{algorithm}[H]
\KwIn{$score$}
\KwOut{Letter Grade}
\BlankLine
\caption{LetterGrade($score$)}
\label{Alg-Score}
\uIf{$score \ge 90$}{
  \textbf{output} $A$;
}
\uElseIf{$80 \le score < 90$}{
  \textbf{output} $B$;
}
\Else{
  \textbf{output} $P$;
}
\end{algorithm}
```

---

**Algorithm 2:** LetterGrade( $score$ )

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**Input:**  $score$

**Output:** Letter Grade

```
1 if  $score \ge 90$  then
2 |   output  $A$ ;
3 else if  $80 \le score < 90$  then
4 |   output  $B$ ;
5 else
6 |   output  $P$ ;
7 end
```

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## 3. While语句样例：

```
\begin{algorithm}[H]
\KwIn{$x$, $y$}
\KwOut{$x$}
\BlankLine
\While{$x \ge y$}{
   $x--y$ \;
}
\textbf{output}  $x$ \;
\end{algorithm}
```

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**Algorithm 3:**  $rm(x, y)$ 

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**Input:**  $x, y$

**Output:**  $x$

```
1 while  $x \ge y$  do
2 |    $x - = y$ ;
3 end
4 output  $x$ ;
```

---

#### 4. For语句样例:

```
\begin{algorithm}[H]
\KwIn{$n \in \mathbb{N}$}
\KwOut{The sum from 1 to $n$}
\BlankLine
\caption{Sum($n$)} \label{Alg-Sum}
$sum=0$;
\For{$temp=0$ to $n$}{
    $sum=sum+temp$;
}
\textbf{output} $sum$;
\end{algorithm}
```

#### 5. Repeat-Until语句样例:

```
\begin{algorithm}[H]
\KwIn{$a, b \in \mathbb{N}$}
\KwOut{Greatest common divide of $a$, $b$}
\BlankLine
\caption{GCD($a$, $b$)} \label{Alg-GCD}

\Repeat{$gcd=0$}{
    $gcd = a \bmod b$;
    $a=b$;
    $b=gcd$;
}
\textbf{output} $gcd$;
\end{algorithm}
```

#### 6. Case语句样例:

```
\begin{algorithm}[H]
\KwIn{$person$}
\KwOut{$person$'s gender}
\BlankLine
\caption{Gender} \label{Alg-Gender}
\Switch{$person$}{
\uCase{$person.gender=male$}{
\textbf{output} Male;
}
\uCase{$person.gender=female$}{
\textbf{output} Female;
}
\Other{
\textbf{output} Unknown;
}
}
\end{algorithm}
```

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#### Algorithm 4: Sum( $n$ )

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**Input:**  $n \in \mathbb{N}$

**Output:** The sum from 1 to  $n$

```
1  $sum \leftarrow 0$ ;
2 for  $temp = 0$  to  $n$  do
3   |  $sum \leftarrow sum + temp$ ;
4 end
5 output  $sum$ ;
```

---

---

#### Algorithm 5: GCD( $a, b$ )

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**Input:**  $a, b \in \mathbb{N}$

**Output:** Greatest common divisor of  $a, b$

```
1 repeat
2   |  $gcd \leftarrow a \bmod b$ ;
3   |  $a \leftarrow b$ ;
4   |  $b \leftarrow gcd$ ;
5 until  $gcd = 0$ ;
6 output  $gcd$ ;
```

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#### Algorithm 6: Gender

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**Input:**  $person$

**Output:**  $person$ 's gender

```
1 switch  $person$  do
2   | case  $person.gender = male$ 
3     | output Male;
4   | case  $person.gender = female$ 
5     | output Female;
6   | otherwise
7     | output Unknown;
8   | endsw
9 endsw
```

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更多样例和解释请参考AlgorithmPackage.pdf帮助文档。