

Data

- int
- float
- double
- char
- string

Expressions

- I/O expressions
- Arithmetic expressions

Control Flow

- Sequential

Data

- int
- float
- double
- char
- string
- bool

Expressions

- I/O expressions
- Arithmetic expressions

Control Flow

- Sequential

The `bool` Data Type

Boolean data type is used to represent true or false values.

It is a primitive data type in Python.

It is used to represent the logical state of an object.

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Kind of data:

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Kind of data: Truth value (True/False)

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Inner representation:

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Boolean Operators:

Not

Not

p	not p
True	False
False	True

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Boolean Operators: `!`

Not

p	not p
True	False
False	True

```
int main() {  
    bool b1, b2, b3;  
  
    return 0;  
}
```


Not

p	not p
True	False
False	True

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = true;  
  
    return 0;  
}
```

Not

p	not p
True	False
False	True

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = true;  
    b2 = !b1;  
  
    return 0;  
}
```

Not

p	not p
True	False
False	True

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = true;  
    b2 = !b1;  
    b3 = !false;  
  
    return 0;  
}
```

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And

And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False

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C++ literals: `true`, `false`

Boolean Operators: `!`, `&&`

And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False

```
int main() {  
    bool b1, b2, b3;  
  
    return 0;  
}
```


And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = true;  
    b2 = false;  
  
    return 0;  
}
```

And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = true;  
    b2 = false;  
    b3 = b1 && b2;  
  
    return 0;  
}
```

And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = true;  
    b2 = false;  
    b3 = b1 && b2;  
    b3 = b1 && !b2;  
  
    return 0;  
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p	q	p or q
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True	False	True
False	True	True
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Or

p	q	p or q
True	True	True
True	False	True
False	True	True
False	False	False

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = false;  
  
    return 0;  
}
```


Or

p	q	p or q
True	True	True
True	False	True
False	True	True
False	False	False

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = false;  
    b2 = b1 || !b1;  
  
    return 0;  
}
```

Or

p	q	p or q
True	True	True
True	False	True
False	True	True
False	False	False

```
int main() {  
    bool b1, b2, b3;  
  
    b1 = false;  
    b2 = b1 || !b1;  
    b3 = b2 && (b1 || true);  
  
    return 0;  
}
```

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Atomic Boolean Expressions:

Compound Boolean Expressions:

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- The `bool` literals – `true`, `false`

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Atomic Boolean Expressions:

- The `bool` literals – `true`, `false`

Compound Boolean Expressions:

Simple boolean expressions combined with boolean operators (`!`, `&&`, `||`)

[illegible]

```
int main() {  
    bool b;  
  
    b = true;  
  
    return 0;  
}
```

```
int main() {  
    bool b;  
  
    b = true;  
    b = (true && !b) ;  
  
    return 0;  
}
```

Boolean Expressions

Atomic Boolean Expressions:

- The `bool` literals – `true`, `false`

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Simple boolean expressions combined with boolean operators (`!`, `&&`, `||`)

Boolean Expressions

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- The `bool` literals – `true`, `false`
- Arithmetic expressions compared with relational operators (`<`, `>`, `<=`, `>=`, `==`, `!=`)

Compound Boolean Expressions:

Simple boolean expressions combined with boolean operators (`!`, `&&`, `||`)

```
int main() {  
    bool b;  
  
    b = true;  
    b = (true && !b) ;  
  
    return 0;  
}
```

```
int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b) ;  
  
    x = 3;  
  
    return 0;  
}
```



```
int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b) ;  
  
    x = 3;  
    b = (x < 5) ;  
  
    return 0;  
}
```

```
int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b) ;  
  
    x = 3;  
    b = (x < 5) ;  
    b = (x >= 0) && (x < 5) ;  
  
    return 0;  
}
```

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int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b) ;  
  
    x = 3;  
    b = (x < 5) ;  
    b = (x >= 0) && (x < 5) ;  
  
    return 0;  
}
```

```
int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b) ;  
  
    x = 3;  
    b = (x < 5) ;  
    b = (x >= 0) && (x < 5) ;  
    b = (x == 3) || (x == 4) ;  
  
    return 0;  
}
```