

Is it Odd or Even?

Odd and Even Numbers

How can we tell if a number is even or odd? For a human being, this is easy, but for a computer it's a bit harder. We know what odd and even numbers look like:

- **Even Numbers:** 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 ...
- **Odd Numbers:** 1, 3, 5, 7, 9, 11, 13, 15, 17, 19 ...

And the rule is that even numbers can be divided evenly by 2, and odd numbers can't be divided evenly; or to put it another way, if you divide an even number by 2, the remainder is 0, and if you divide an odd number by 2, the remainder is 1.

Division Remainder

Is there a way to write a computer program that focuses just on the remainder of a division, and not the division result itself? As it happens there is, in Python there is a special type of division, called Division Remainder (as we saw on Page 7), that uses the "%" symbol, and returns the remainder result of a division. So if we use this form of division, and divide a number by 2, if the number is even, there will be no remainder, but if the number is odd, there is a remainder of one, For example:

<code>print(9 % 2)</code>	<code>1</code>	<code>print(8 % 2)</code>	<code>0</code>	<code>print(7 % 2)</code>	<code>1</code>
<code>print(6 % 2)</code>	<code>0</code>	<code>print(5 % 2)</code>	<code>1</code>	<code>print(4 % 2)</code>	<code>0</code>
<code>print(3 % 2)</code>	<code>1</code>	<code>print(2 % 2)</code>	<code>0</code>	<code>print(1 % 2)</code>	<code>1</code>

So we can ask the user to input a number, store it in the variable `InputNumber`, and then check if `(InputNumber % 2)` gives a result of 1, then it's odd, and if the result is 0, it's even. So the condition to check if it's odd could either be:

```
if (InputNumber % 2) == 1:
```

Or we could state the same condition as:

```
if (InputNumber % 2) != 0:
```

And they both give the same result (since the condition "equal to 1", is the same as "not equal to 0", in this particular case).

Comments

In a program, if we put the hash symbol ("#") at the start of a line, we are adding in a comment, which the Python interpreter will ignore, but it helps make the code clear for someone who is reading it. So the full code is as follows:

```
# PROGRAM IsOddOrEven:
InputNumber = int(input("Please input the number\n"))
if (InputNumber % 2) == 1:
    print(InputNumber, "is odd")
else:
    print(InputNumber, "is even")
# ENDIF;
# END.
```

The comments have a PROGRAM name; an END to the IF, and an END program.