Python Beginners Practice Worksheet

How to use this worksheet:

- 1. Read the grey **Example** box. Look at the code AND the output.
- 2. Type the example into Python and run it. Check you get the same output.
- 3. Do the **Try it** tasks underneath. They are almost the same as the example - just change one or two words.
- 4. If you get stuck: check spelling, check " quotes, check ( ) brackets, check : colons and spaces at the start of lines.
- 5. Tick off each task when it works.

Golden rules:

- Text must be inside quotes: "Hello"
- Numbers have no quotes: 15
- input() always gives you text, even if you type a number. Use int() to turn it into a whole number.
- After if, elif, else, for, while, always put : and indent (4 spaces) on the next line.
- Turtle draws on the canvas: forward(n) moves, left(90) / right(90) turn, color("red") changes pen, penup() / pendown() lift and drop it.

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1. `print()` - Getting Python to talk

print() shows something on the screen.

Code:

```
print("Hello!")
print("I am learning Python.")
```

Output:

```
Hello!
I am learning Python.
```

Example 1B - Print numbers and maths

Code:

```
print(5)
print(2 + 3)
print("2 + 3 = ", 2 + 3)
```

Output:

```
5
5
2 + 3 =  5
```

Tip: Text needs quotes. Numbers do not. print("5") and print(5) both show 5, but they are different types.

Try it - Section 1 (just copy the pattern)

- 1.1 Print Hi! on the screen.
- 1.2 Print your first name on the screen.

- 1.3 Print your favourite game on the screen.
- 1.4 Print the number 100 on the screen.
- 1.5 Print 7 + 8 so Python works out the answer. You should see 15.
- 1.6 Print two lines: your name on line 1, your age on line 2.
- 1.7 PREDICT: What will this print? Then run it to check.

Code:

```
print("Pizza")
print("Burger")
```

- 1.8 FIX IT: This has 1 mistake. Fix it and run it.

Code:

```
print("I like coding)
```

Challenge 1 - ID Card (mini task)

Print 3 lines, like this. Use your own details:

Output:

```
Name: Alex
Age: 14
Favourite colour: blue
```

---

2. Variables - Storing things in boxes

A variable is a named box that stores something. You make one with =:

name = value

Example 2A - Text variables

Code:

```
name = "Alice"
colour = "blue"
print(name)
print(colour)
print("Hello", name)
```

Output:

```
Alice
blue
Hello Alice
```

Example 2B - Number variables

Code:

```
age = 14
score = 10
print(age)
print(score)
print(score + 5)
```

Output:

```
14
10
15
```

Example 2C - Changing a variable

Code:

```
score = 10
print(score)
score = 20
print(score)
```

Output:

```
10
20
```

Try it - Section 2

- 2.1 Make a variable called name with your name in it. Print it.
- 2.2 Make a variable called game with your favourite game in it. Print it.
- 2.3 Make a variable called age with your age in it (no quotes). Print it.
- 2.4 Make a variable points = 5. Print points + 10. You should see 15.
- 2.5 Make a variable city = "London". Print "I live in" and city together.
- 2.6 PREDICT: What will this print?

Code:

```
pet = "cat"
print(pet)
pet = "dog"
print(pet)
```

- 2.7 FIX IT:

Code:

```
name = Alice
print(name)
```

Challenge 2 - About Me

Make 3 variables: my_name, my_age, my_hobby. Print them like this:

Output:

```
My name is ...
I am ... years old.
My hobby is ...
```

---

3. `input()` - Asking the user to type

input() asks a question and waits for the user to type. Always save the answer in a variable.

Pattern to copy every time:

Code:

```
name = input("Enter your name: ")
print("Hello", name)
```

Example 3A

Code:

```
name = input("Enter your name: ")
print("Hello", name)
```

Example run (user typed `Bob`):

Output:

```
Enter your name: Bob
Hello Bob
```

Example 3B - Two inputs

Code:

```
name = input("Enter your name: ")
colour = input("Enter your favourite colour: ")
print("Hello", name, "you like", colour)
```

Example run:

Output:

```
Enter your name: Aisha
Enter your favourite colour: red
Hello Aisha you like red
```

Try it - Section 3 (repeat the pattern again and again)

- 3.1 Ask for the user's name and print Hello + their name.
- 3.2 Ask for favourite food and print it back: You like ...
- 3.3 Ask for favourite game and print it back.
- 3.4 Ask for school name and print it back.
- 3.5 Ask for favourite animal, save in animal, print My favourite animal is + animal.
- 3.6 Ask for TWO things: name and city. Print them together like Example 3B.
- 3.7 PREDICT: What does this do?

Code:

```
food = input("Food: ")
print("Yum,", food)
```

- 3.8 FIX IT:

Code:

```
name = input("Enter name: ")
print(name
```

Challenge 3 - Friendly Robot

- 1. Ask for name.
- 2. Ask for hobby.
- 3. Print: Hello NAME! Your hobby HOBBY is cool!

Example run:

Output:

```
Enter your name: Leo
Enter your hobby: football
Hello Leo! Your hobby football is cool!
```

---

4. Maths in Python - `+ - * /`

Python is a calculator. You must use * for times and / for divide.

Example 4A

Code:

```
print(10 + 5)
print(10 - 5)
print(10 * 5)
print(10 / 5)
print(2 ** 3)
```

Output:

```
15
5
50
2.0
8
```

Tip: Double-star means to the power of. Example: 2 to the power 3 = 2 x 2 x 2 = 8. In code you write 2 star-star 3 (see example above).

Example 4B - Maths with variables

Code:

```
a = 12
b = 4
print(a + b)
print(a - b)
print(a * b)
print(a / b)
```

Output:

```
16
8
48
3.0
```

Try it - Section 4

- 4.1 Print 6 + 4. You should see 10.
- 4.2 Print 9 - 3. You should see 6.
- 4.3 Print 7 * 6. You should see 42.
- 4.4 Print 20 / 4. You should see 5.0.
- 4.5 Make x = 15 and y = 3. Print x + y, x - y, x * y, x / y (4 lines).
- 4.6 Make points = 20. Print points * 2.
- 4.7 Make price = 100. Print price / 10.
- 4.8 PREDICT: What will this print?

Code:

```
a = 5
b = 2
print(a * b)
```

Challenge 4 - Score Doubler

- 1. Make score = 25.
- 2. Print score * 2.
- 3. Change score to 40.
- 4. Print score * 2 again.

---

5. `int()` and `float()` - Turning input into numbers

This is SUPER important. input() always gives TEXT, even if you type 10.

To do maths, convert it first with int() (whole number) or float() (decimal).

Example 5A - The problem (without int)

Code:

```
age = input("Enter your age: ")
print(age + 1)
```

If you type 14, this CRASHES because "14" + 1 = text + number. Python does not allow it.

Example 5B - The fix (with int)

Code:

```
age = int(input("Enter your age: "))
print(age + 1)
```

Example run:

Output:

```
Enter your age: 14
15
```

Example 5C - Adding two numbers

Code:

```
first = int(input("Enter first number: "))
second = int(input("Enter second number: "))
total = first + second
print("The sum is", total)
```

Example run:

Output:

```
Enter first number: 10
Enter second number: 5
The sum is 15
```

Example 5D - Decimals with float

Code:

```
price = float(input("Enter price: "))
print(price * 2)
```

Example run:

Output:

```
Enter price: 2.5
5.0
```

Try it - Section 5 (copy Example 5C, change the maths)

- 5.1 Ask for two whole numbers. Print their sum (total). Copy Example 5C exactly first.
- 5.2 Ask for two whole numbers. Print first - second.
- 5.3 Ask for two whole numbers. Print first * second.
- 5.4 Ask for apples = int(input(...)). Print apples + 5.
- 5.5 Ask for points. Print points * 10.
- 5.6 Ask for a decimal number with float(input(...)). Print it times 2.
- 5.7 PREDICT: What happens here if user types 7? Why?

Code:

```
num = input("Enter number: ")
print(num * 3)
```

Hint: If num is "7", "7" * 3 = "777". Test it!

- 5.8 FIX IT: Make it add correctly.

Code:

```
a = input("Enter first number: ")
b = input("Enter second number: ")
print(a + b)
```

Challenge 5 - Simple Adder (like old Q2, but now you can do it!)

Ask for two numbers, convert to int, add them, print result exactly like this:

Output:

```
Enter first number: 10
Enter second number: 5
The sum is 15
```

---

6. `if` and `else` - Making decisions

Pattern:

Code:

```
if age >= 13:
    print("Teenager or older")
else:
    print("Younger than 13")
```

- Always put : after the condition.
- Always indent the next line (4 spaces).
- Symbols: > greater than, < less than, >= greater or equal, <= less or equal, == exactly equal (two equals!), != not equal.

Example 6A - One decision

Code:

```
age = int(input("Enter your age: "))
if age >= 13:
    print("You are a teenager or older.")
else:
    print("You are younger than 13.")
```

Example run 1:

Output:

```
Enter your age: 15
You are a teenager or older.
```

Example run 2:

Output:

```
Enter your age: 10
You are younger than 13.
```

Example 6B - Pass or fail

Code:

```
mark = int(input("Enter your mark: "))
if mark >= 50:
    print("Pass!")
else:
    print("Fail. Try again!")
```

Example run:

Output:

```
Enter your mark: 62
Pass!
```

Try it - Section 6 (same pattern, different numbers/words)

- 6.1 Ask for age. If age >= 16 print You can watch a 16 film. Else print Too young.
- 6.2 Ask for mark. If mark >= 40 print Pass. Else print Fail.
- 6.3 Ask for temperature. If temp > 20 print Warm. Else print Cold.
- 6.4 Ask for number. If number > 0 print Positive. Else print Zero or negative.
- 6.5 Ask for score. If score == 100 print Perfect! Else print Keep trying!
- 6.6 PREDICT: What prints if user types 30?

Code:

```
speed = int(input("Enter speed: "))
if speed > 30:
    print("Too fast!")
else:
    print("OK speed.")
```

- 6.7 FIX IT (missing colon + indent):

Code:

```
age = int(input("Age: "))
if age >= 18
print("Adult")
else:
print("Child")
```

Challenge 6 - Positive or Negative or Zero? (easy version first)

Ask for an integer. If it is > 0 print Positive. Else print Not positive.

Test twice: with 5 and with -7.

Extension: Can you add a second if to also check for zero? (We do full version in Section 7.)

---

7. `elif` - More than two choices

Use elif (short for else-if) when you have 3+ options. Python checks from top to bottom and runs the FIRST true one.

Example 7A - Age groups (simple version)

Code:

```
age = int(input("Enter your age: "))
if age < 13:
    print("You are a child.")
elif age <= 17:
    print("You are a teenager.")
else:
    print("You are an adult.")
```

Example runs:

Output:

```
Enter your age: 10
You are a child.
```

Output:

```
Enter your age: 15
You are a teenager.
```

Output:

```
Enter your age: 30
You are an adult.
```

Example 7B - Full age categories (old Q4, now step-by-step)

Code:

```
age = int(input("Enter your age: "))
if age < 13:
    print("You are a child.")
elif age <= 17:
    print("You are a teenager.")
elif age <= 64:
    print("You are an adult.")
else:
    print("You are a senior citizen.")
```

Example run:

Output:

```
Enter your age: 25
You are an adult.
```

Example 7C - Positive / Negative / Zero (old Q5)

Code:

```
num = int(input("Enter a number: "))
if num > 0:
    print("Positive")
elif num < 0:
    print("Negative")
else:
    print("Zero")
```

Example run:

Output:

```
Enter a number: -7
Negative
```

Try it - Section 7

- 7.1 Copy Example 7A and run it 3 times: age 10, 15, 30.
- 7.2 Make a grade checker: if mark >= 70 print Gold, elif mark >= 40 print Silver, else print Bronze.

- 7.3 Make a weather checker: if temp < 0 print Freezing!, elif temp < 20 print Cool, else print Warm.
- 7.4 Make a number checker: copy Example 7C. Test with 5, -3, 0 (3 runs).
- 7.5 Make a film checker: if age < 12 print U and PG only, elif age < 15 print Up to 12A, else print Ask an adult for 15/18.
- 7.6 PREDICT: What prints if age = 70 in Example 7B?
- 7.7 FIX IT:

Code:

```
num = int(input("Number: "))
if num > 0:
print("Positive")
elif num < 0:
print("Negative")
```

Challenge 7 - Age Category Machine

Write the full program from Example 7B from memory (cover the example!). Test with 8, 14, 25, 70. You should get child, teenager, adult, senior citizen.

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8. Special number jobs - `%`, rounding, circle area

8A. `%` (modulo) - Remainder. Perfect for even/odd.

10 % 2 = 0 (10 / 2 leaves 0). 11 % 2 = 1 (11 / 2 leaves 1).

- Even numbers always give 0 when % 2.
- Odd numbers always give 1 when % 2.

Example 8A - Even or Odd (old Q6)

Code:

```
num = int(input("Enter a number: "))
if num % 2 == 0:
    print("Even")
else:
    print("Odd")
```

Example run:

Output:

```
Enter a number: 10
Even
```

Try it - 8A

8A.1 Copy Example 8A. Test with 4, 7, 10, 15.

8A.2 Ask for a number. Print num % 2. What do you notice for evens/odds?

8A.3 Ask for a number. If num % 5 == 0 print Multiple of 5 else print Not multiple of 5.

8B. Rounding to 2 decimals - `round(answer, 2)`

Example 8B

Code:

```
answer = 10 / 3
print(answer)
print(round(answer, 2))
```

Output:

```
3.3333333333333335
3.33
```

Try it - 8B

8B.1 Print 10 / 3 rounded to 2 decimals.

8B.2 Print 7 / 3 rounded to 2 decimals.

8B.3 Ask for two numbers, divide them, print rounded to 2 decimals.

8C. Area of a circle - Put it all together (old Q3, step-by-step)

Formula: area = 3.14 * radius * radius

Example 8C

Code:

```
radius = float(input("Enter the radius: "))
area = 3.14 * radius * radius
print("The area of the circle is", round(area, 2))
```

Example run:

Output:

```
Enter the radius: 7
The area of the circle is 153.86
```

Note: 3.14 x 7 x 7 = 153.86. (Old sheet said 153.94 - that was a typo. Trust Python!)

Try it - 8C

8C.1 Copy Example 8C. Test with radius 7, then radius 10 (should be 314.0).

8C.2 Change PI to 3.14159 and test again with radius 5.

8C.3 Make a square-area calculator: area = side * side.

Challenge 8 - Temperature Checker (easier version of old Project 1)

- 1. Ask for temp in Celsius: c = float(input("Enter temp in Celsius: "))
- 2. Convert: f = c * 9/5 + 32
- 3. Print: The temp in Fahrenheit is ... rounded to 2 decimals.
- 4. If c < 0: print It's very cold! Else print It's quite warm!

Example runs:

Output:

```
Enter temp in Celsius: 25
The temp in Fahrenheit is 77.0
It's quite warm!
```

Output:

```
Enter temp in Celsius: -10
The temp in Fahrenheit is 14.0
It's very cold!
```

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9. Strings - Playing with words

Example 9A - UPPER, lower, length

Code:

```
name = input("Enter your name: ")
print(name.upper())
print(name.lower())
print(len(name))
```

Example run (typed `Alice`):

Output:

```
Enter your name: Alice
ALICE
alice
5
```

Tip: .upper() = BIG LETTERS, .lower() = small letters, len() = how many letters.

Example 9B - Reverse with `[::-1]`

Code:

```
name = input("Enter your name: ")
print(name[::-1])
```

Example run:

Output:

```
Enter your name: Alice
ecilA
```

Example 9C - Both together (old Q7)

Code:

```
name = input("Enter your name: ")
print(name.upper())
print(name[::-1].upper())
```

Example run:

Output:

```
Enter your name: Alice
ALICE
ECILA
```

Try it - Section 9

- 9.1 Ask for name. Print it in UPPER case.
- 9.2 Ask for name. Print it in lower case.
- 9.3 Ask for favourite food. Print its length with len(). E.g. pizza = 5.
- 9.4 Ask for a word. Print it reversed with [::-1].
- 9.5 Ask for name. Print UPPER then reversed UPPER (copy Example 9C).
- 9.6 Ask for TWO words and print them together: print(word1 + word2). What happens? Now try print(word1 + " " + word2).
- 9.7 PREDICT: What prints if name = Ben?

Code:

```
name = "Ben"
print(name.upper())
print(len(name))
```

Challenge 9 - Name Fun Machine

Ask for name once, then print 4 lines:

- 1. Original name
- 2. UPPER case
- 3. lower case
- 4. Reversed
- 5. Length: Your name has X letters.

---

10. `for` loops - Repeat without copy-paste

Pattern:

Code:

```
for i in range(5):
    print(i)
```

range(5) = 0,1,2,3,4 (5 numbers, starting at 0!).

Example 10A - Count from 0

Code:

```
for i in range(5):
    print(i)
```

Output:

```
0
1
2
3
4
```

Example 10B - Count from 1 to 5

Code:

```
for i in range(1, 6):
    print(i)
```

Output:

```
1
2
3
4
5
```

Tip: range(1, 6) = start at 1, stop BEFORE 6.

Example 10C - Repeat words

Code:

```
for i in range(3):
    print("Hello!")
```

Output:

```
Hello!
Hello!
Hello!
```

Example 10D - Times table (2x)

Code:

```
for i in range(1, 6):
    print("2 x", i, "=", 2 * i)
```

Output:

```
2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
```

Try it - Section 10

- 10.1 Copy Example 10A. Change 5 to 3. What happens?
- 10.2 Print numbers 1 to 10 with range(1, 11).
- 10.3 Print Hi! 5 times using a loop.
- 10.4 Ask for name. Print it 3 times using a loop.

- 10.5 Print the 5x table from 1 to 5 (copy Example 10D, change 2 to 5).
- 10.6 Print even numbers: for i in range(0, 11, 2): print(i) - what does the 2 do?
- 10.7 FIX IT:

Code:

```
for i in range(5)
print(i)
```

Challenge 10 - Times Table Printer

Ask for a number. Print its times table from 1 to 10.

Example run (typed `3`):

Output:

```
Enter number: 3
3 x 1 = 3
3 x 2 = 6
3 x 3 = 9
... up to 3 x 10 = 30
```

---

11. Turtle - Draw shapes with code

Turtle draws shapes on the canvas below your console. forward(100) moves 100 steps, left(90) turns left 90 degrees. Four of each makes a square. (import turtle + t = turtle.Turtle() also works.)

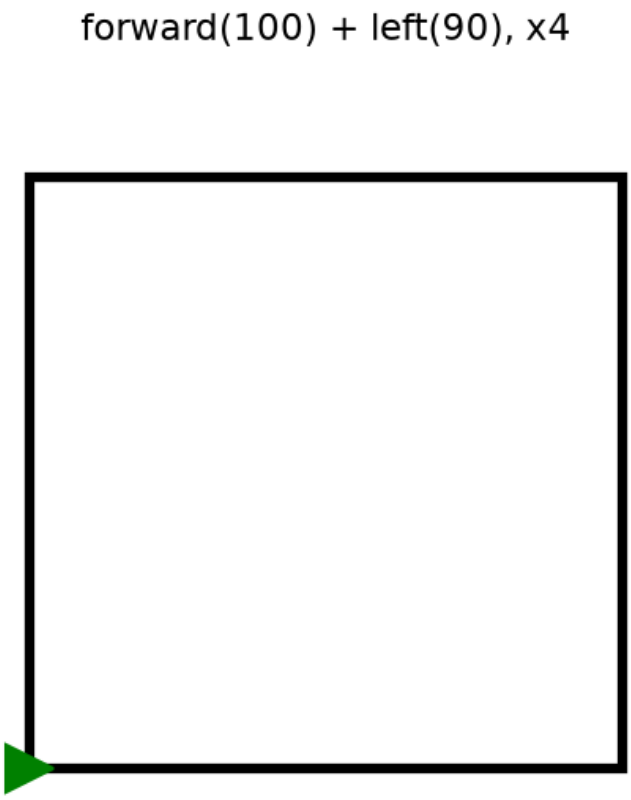
Example 11A - Square

Code:

```
from turtle import forward, left
for i in range(4):
    forward(100)
    left(90)
```

This draws a square (no text output - look at the canvas!):

Square drawn by turtle - four sides of 100 steps



Tip: The canvas centres near the turtle start. If a drawing wanders off, move the camera with the arrow buttons under the canvas.

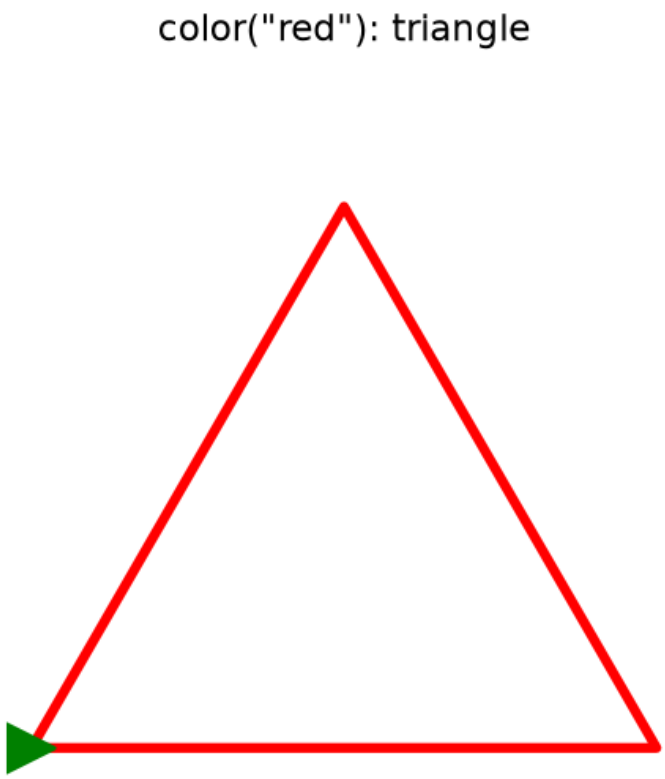
Example 11B - Colour triangle

Code:

```
from turtle import forward, left, color
color("red")
for i in range(3):
    forward(100)
    left(120)
```

This draws a red triangle:

Red triangle drawn by turtle



Tip: A square turns 90 degrees 4 times (4 x 90 = 360). A triangle turns 120 degrees 3 times (3 x 120 = 360). Try blue and green with color().

Try it - Section 11

- 11.1 Run the square (Example 11A). Where on the canvas does it appear?
- 11.2 Change 100 to 50. Run again - what changed?
- 11.3 Make a triangle: range(3) with left(120). Why 120 and not 90?
- 11.4 Add color("red") before the loop. Try blue and green.
- 11.5 Lift the pen: penup(), forward(150), pendown(), then draw a square. What happened?
- 11.6 PREDICT: forward(100) + right(90) four times - square or mirror image? Run it.
- 11.7 FIX IT: This loop is missing its left(90) turn, so it draws a line. Fix it and run it.

Code:

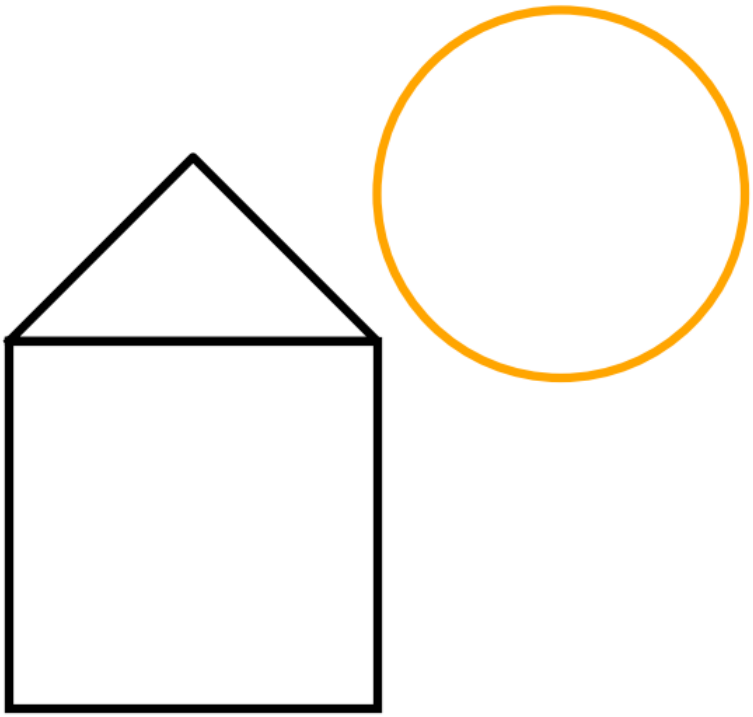
```
from turtle import forward, left
for i in range(4):
    forward(100)
```

Challenge 11 - Little house

Draw a square, then a triangle roof on top. Add circle(50) for a sun:

Little house with triangle roof and circle sun

house + roof + circle(50) sun



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12. `while` loops - Repeat until something happens

Pattern:

Code:

```
count = 1
while count <= 5:
    print(count)
    count = count + 1
```

Tip: Don't forget the last line! Without count = count + 1 the loop never stops.

Example 12A - Count 1 to 5

Code:

```
count = 1
while count <= 5:
    print(count)
    count = count + 1
```

Output:

```
1
2
3
4
5
```

Example 12B - Countdown

Code:

```
count = 5
while count >= 1:
    print(count)
    count = count - 1
print("Blast off!")
```

Output:

```
5
4
3
2
1
Blast off!
```

Try it - Section 12

- 12.1 Copy Example 12A. Change 5 to 10.
- 12.2 Copy Example 12B. Start from 10 instead of 5.
- 12.3 Make a while loop that prints 0 to 3.
- 12.4 PREDICT: What happens if you forget count = count + 1? (Don't run forever - press Stop / Ctrl+C if it never ends!)
- 12.5 FIX IT:

Code:

```
count = 1
while count <= 5:
print(count)
```

Challenge 12 - Countdown Machine

Ask for a starting number. Count down to 1, then print Blast off!

Example run:

Output:

```
Enter start: 4
4
3
2
1
Blast off!
```

13. Final Mini-Projects - Pick ONE (or do all three!)

You now know all the basics! Each project has steps to follow. You have done each step before - just join them together.

Mini-Project A - Chatty Greeting Bot (Easy *)

Steps:

- 1. Ask for name with input().
- 2. Ask for age with int(input()).
- 3. Ask for hobby with input().
- 4. Print: Hello NAME! You are AGE. HOBBY is awesome!
- 5. If age < 13 print You are a child., elif age <= 17 print You are a teenager., else print You are an adult.

Example run:

Output:

```
Enter your name: Mia
Enter your age: 14
Enter your hobby: drawing
Hello Mia! You are 14. drawing is awesome!
You are a teenager.
```

Mini-Project B - Simple Calculator (Medium **)

Steps:

- 1. Ask for operation: op = input("Choose (+, -, *, /): ")
- 2. Ask for two numbers: a = float(input(...)), b = float(input(...))
- 3. Use if/elif/else:

Code:

```
if op == "+":
    print("Result:", a + b)
elif op == "-":
    print("Result:", a - b)
elif op == "*":
    print("Result:", a * b)
elif op == "/":
    print("Result:", a / b)
else:
    print("Unknown operation!")
```

- 4. Test all 4: 12 + 5 = 17, 12 - 5 = 7, 12 * 5 = 60, 12 / 5 = 2.4

Mini-Project C - Times Table + Even/Odd Tester (Medium **)

Steps:

- 1. Ask for a number.
- 2. Print if it is Even or Odd (use % 2).
- 3. Print if it is Positive, Negative or Zero.

- 4. Print its times table 1-5 using a for loop.

Example run:

Output:

```
Enter a number: 4
Even
Positive
4 x 1 = 4
4 x 2 = 8
4 x 3 = 12
4 x 4 = 16
4 x 5 = 20
```

Well done! If you finished all sections, you know print, variables, input, maths, int/float, if/elif/else, strings, for loops, turtle drawings and while loops - all the Python basics.

Checklist - I can...

- [ ] print words and numbers
- [ ] make variables
- [ ] ask for input
- [ ] do + - * / and convert with int()
- [ ] use if / else and elif
- [ ] check even/odd with %
- [ ] change strings with upper/lower/len/reverse
- [ ] write for loops
- [ ] draw squares and triangles with turtle (forward / left / color / penup / pendown / circle)
- [ ] write while loops