

CS 114 Tutorial 2

Sept 19 2025

Goals for this Week:

- ❏ Start Assignment 01 (due next Friday)
- ❏ Understand how to use booleans in python (<, >=, ==, !=, True)
- ❏ Understand how to write conditions (if, elif, else)
- ❏ Become familiar with using and/or

Try the following in python as a warmup.

Write a function that calculates the term of a pattern given it's term #.

def pattern(n):

Term 1 = $(1*2)^2$ Term 2 = $-(2*2)^2$

Term 3 = $(3*2)^2$ Term 4 = $-(4*2)^2$

Solutions found in
Tutorial 2 solns.ipynb

Create a function that returns true if a given number is between 5 and 10 inclusive or if it is higher than 15.

def bools(x):

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Annotations

- Gives information about the function parameters
- Tells you what type of variables are needed and returned

Which would you choose to use to describe the follow:

```
def area_garden(l, w):
```

- A. `area_garden(l: int, w: int) → int:`
- B. `area_garden(l: float, w: float) → int:`
- C. `area_garden(l: str, w: str) → str:`
- D. `area_garden(l: float, w: float) → float:`



Assert

```
def fun_A(n):  
    assert n > 0, "n must be > 0"  
    return n  
  
def fun_B(n):  
    assert("n > 0", "n must be > 0")  
    return n  
  
def fun_C(n):  
    assert n > 0 and "n must be > 0"  
    return n  
  
def fun_D(n):  
    assert n > 0 "n must be > 0"  
    return n
```

Which function correctly uses assert?

A.

B.

C.

D.



Conditionals

```
score = 85
passed = score >= 50

if passed:
    print("Pass")
elif score >= 80:
    print("High pass")
else:
    print("Fail")
```

What does this program print?

A. Pass

B. High Pass

C. Fail

D. Pass

High Pass

Fail



And

```
x = 5
y = 10

print ("A", (x <= 4) and (y > 8))
print ("B", (x != 3) and (y > 10))
print ("C", ((x + y) == 15) and (x != 7))
print ("D", (y >= 20) and ((x + y) % 2 == 0))
```

Which will print True?

A.

B.

C.

D.



Or

```
x = 5
y = 10

print ("A", (x <= 4) or (y > 8))
print ("B", (x != 3) or (y > 10))
print ("C", ((x + y) == 15) or (x != 7))
print ("D", (y >= 20) or ((x + y) % 2 == 0))
```

Which will print False?

A.

B.

C.

D.

- a) Write a function `num_roots()` that takes the coefficients of a quadratic as parameters and returns the **number of roots**.
- b) Write a function `quadratic()` that takes the coefficients of a quadratic as parameters and **if there are real roots**, it returns the root **using addition** in the quadratic formula. Otherwise it **returns 0**.

Solutions found in
Tutorial 2 solns.ipynb

Discriminant

Quadratic Equation

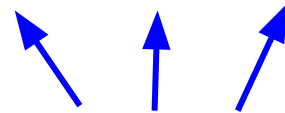
MATH
MONKS

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- If $b^2 - 4ac > 0$ 2 real solutions
- If $b^2 - 4ac = 0$ 1 real solution
- If $b^2 - 4ac < 0$ no real solutions

Quadratic Function

$$f(x) = ax^2 + bx + c$$



Coefficients