

# Introduction to programming in Python

CSC 109 Lyon College @ Batesville High

## Table of Contents

- [1. Three if, else, elif exercises](#)
- [2. Three while loop exercises](#)

## 1. Three if, else, elif exercises

These exercises will help you practice basic conditional statements in Python and get a grasp of how to use if, elif, and else.

### Exercise 1: Movie Age Restriction

#### Problem:

Write a program that asks the user for their age and tells them which movies they are allowed to watch:

- Ages under 13: "You can watch PG movies."
- Ages 13 to 17: "You can watch PG-13 movies."
- Ages 18 and above: "You can watch R-rated movies."

#### Solution

```
age = int(input("What's your age? "))
if age < 13:
    print("You can watch PG movies.")
elif 13 <= age < 17:
    print("You can watch PG-13 movies.")
else:
    print("You can watch R-rated movies.")
```

### Exercise 2: Days of the Week

#### Problem:

Ask the user for a number between 1 and 7 and print the corresponding day of the week. (1 for Monday, 2 for Tuesday, etc.). If the number is outside of that range, print "Invalid number."

#### Solution:

Without conditional statements, using an f-string:

```
num = int(input("Enter number between 1 and 7: "))
weekday = ['Monday', 'Tuesday', 'Wednesday', 'Thursday',
           'Friday', 'Saturday', 'Sunday']
```

```
if (num < 1 or num > 7):
    print(f"{num} is an invalid number")
else:
    print(f"It's {weekday[num-1]}")
```

Another solution: using the calendar library:

```
from calendar import day_name
num = int(input("Enter number between 1 and 7: "))
if (num < 1 or num > 7):
    print(f"{num} is an invalid number")
else:
    print(f"It's {day_name[num-1]}")
```

Pedestrian solution with conditional statements:

```
day_num = int(input("Enter a number between 1 and 7: "))

if day_num == 1:
    print("Monday")
elif day_num == 2:
    print("Tuesday")
elif day_num == 3:
    print("Wednesday")
elif day_num == 4:
    print("Thursday")
elif day_num == 5:
    print("Friday")
elif day_num == 6:
    print("Saturday")
elif day_num == 7:
    print("Sunday")
else:
    print("Invalid number.")
```

## Exercise 3: Basic Calculator

### Problem:

Write a program that:

- Asks the user for two numbers.
- Asks the user for an operation (+, -, \*, /).
- Performs the operation on the two numbers and prints the result.

If the operation is not recognized, print "Invalid operation."

### Simple solution:

```
num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))
operation = input("Enter an operation (+, -, *, /): ")

if operation == "+":
    print(f"Result: {num1 + num2}")
```

```

elif operation == "-":
    print(f"Result: {num1 - num2}")
elif operation == "*":
    print(f"Result: {num1 * num2}")
elif operation == "/":
    if num2 == 0:
        print("Error: Division by zero.")
    else:
        print(f"Result: {num1 / num2}")
else:
    print("Invalid operation.")

```

### Complete solution:

```

# import sys library for graceful exit
import sys

# define calculator
def calc(num1,num2,op):
    if op == "+":
        return num1 + num2
    elif op == "-":
        return num1 - num2
    elif op == "*":
        return num1 * num2
    else:
        try:
            result = num1 / num2
            return result
        except ZeroDivisionError:
            print("Zero division error")

# input numbers and operator
num1, num2 = map(int,input("Enter two numbers separated by comma: ").split(','))
operator = input("Enter operator [+,-,*,/]: ")

# check if operator allowed otherwise exit
if operator not in ['+', '-', '*', '/']:
    sys.exit("Invalid operator")

# call calculator function
calc(num1,num2,operator)

```

## 2. Three while loop exercises

These exercises will help you practice basic control structures in Python and understand the mechanics of while loops.

### Exercise 1: Count Up

#### Problem:

Write a program that asks the user for a number and then counts up from 1 to that number using a while loop.

#### Solution

```
num = int(input("Enter a whole number: "))
i = 1
while i <= num:
    print(f'Count: {i}')
    i += 1
```

## Exercise 2: Sum of Numbers

### Problem:

Write a program that continually asks the user for numbers until they enter 'stop'. Once they enter 'stop', print out the sum of all the numbers they entered.

### Solution:

```
total = 0
while True:
    user_input = input("Enter a number (or 'stop' to finish): ")
    if user_input == "stop":
        break
    total += int(user_input)
    print(f"The sum of all the numbers is: {total}")
```

## Exercise 3: Guess the Number

### Problem:

Implement a number guessing game. The program should randomly select a number between 1 and 10 and ask the user to guess it. If the user's guess is too high or too low, it should tell them so. When the user guesses correctly, the program should congratulate them and show the number of attempts it took.

*Tip: you can use the randint function from the random library.*

### Solution:

```
import random

number = random.randint(1, 10)
guess = None
attempts = 0

while guess != number:
    guess = int(input("Guess a number between 1 and 10: "))
    attempts += 1
    if guess < number:
        print("Too low!")
    elif guess > number:
        print("Too high!")

print(f"Congratulations! You guessed the number {number} in {attempts} attempts.")
```