

# IO and Calcs

1. Write a program that prints personal information

```
'''
    print("""
Name: Abdullah Al-Banna
Age: 23
Email: abdullah@albannatech.com

""")
'''
```

2. Write a program that will print your name as so with **sep**

```

P*****Y*****T*****H*****O*****N

'''
    print("Abdullah", sep="*****")
'''
```

3. Write a program to get 2 numbers and get ....

4. Write a program that asks the user the price in Yemeni and then convert it to Saudi Ryal and USD

```
'''
    y_reyal = int(input("Enter in yemni reyal: "))
    sa_reyal = y_reyal / 140
    usd = y_reyal = / 534

    print(f"Saudi Reyal: {sa_reyal}")
    print(f"{usd = }")
'''
```

5. Write a program that asks from the student to enter 5 grades and then print the average and the result

```
'''
```

```

grades = []
for i in range(1, 6):
    grades.append(float(input(f"Enter the #{i} grade: ")))

print(sum(grades) / len(grades))
'''

```

6. Write a program that asks the product name and the price and the count and then print the receipt

```

'''
product = input("Enter the product: ")
price = float(input("Enter the price: "))
count = int(input("Enter the count: "))

print(f"""

{product} = {price * count}
{price} = {price}
{count} = {count}

-----
Total: {price * count}
""")
'''

```

7. Write a program that finds out the length of the string and the words

```

'''
s = "hello world"

print(f"The length: {len(s)}\nwords: {len(s.split())}")
'''

```

8. Write a program to find the ASCII number from the user or the other way around

```

'''
num = input("Enter a number: ")

print(f"ascii: {chr(num)}")
'''

```

9. Write a program that swaps 2 variables

```

'''
    x = 1
    y = 2

    x = x + y

    y = x - y
    x = x - y
'''

```

10. Write a program to calculate the monthly salary depending on the work hours in a day...

```

'''
    worked_hours = 12
    worked_days = 30

    money_per_hour = 2 # dollars

    salary = (money_per_hour * worked_hours) * worked_days

    print(f"salary = ")
'''

```

## Conditions and Logical Operations

1. Write a program to check whether the number is odd or even

```

'''
    num = 5

    print("even" if num % 2 == 0 else "odd")
'''

```

2. Write a program to check a number from the user if it's negative or positive or equal 0

```

'''
    num = int(input("Enter a number: "))

    if num > 0:
        print("positive")
'''

```

```

elif num < 0:
    print("negative")
else:
    print("zero")
'''

```

3. Write a program to check a number whether it can be divided to **3** or **5**

```

'''
num = 5

if num % 3 == 0 or num % 5 == 0:
    print("yes")
'''

```

4. Write a program that asks the student to enter 6 grades and then print a welcoming message depending on his result

```

'''
grades = []
for I in range(1, 7):
    grades.append(float(input(f"Enter the #{I} grade: ")))

avg = sum(grades) / len(grades)

if avg > 90:
    print("Welcome Genuis")
elif avg > 80:
    print("Welcome Smart Fella")
elif avg > 60:
    print("Welcome Student")
elif avg >= 50:
    print("Welcome.. or maybe not!")
else:
    print("no")
'''

```

5. Write a program to check if a letter is a vowel or not

```

'''
VOULS = ["a", "o", "i", "e", "n"]

letter = "k"

if letter in VOULS:

```

```

        print("Voul")
    else:
        print("no")
'''

```

6. Write a program that check if a letter is capital or small

```

'''
    letter = "K"

    if letter.islower():
        print("small")
    else:
        print("capital")
'''

```

7. Write a program that asks the user to enter a day of the week and check if its a weekend or not

```

'''
    DAYS = ["fri", "sat", "sun", "mon", "thu", "wed", "thr"]
    day = input("Enter a day")

    if day.lower() in DAYS:
        if day.lower() in [DAYS[0], DAYS[-1]]:
            print("Weekend")
        else:
            print("not weekend")

    else:
        print("not a day")

'''

```

8. Write a program that prints the education level (middle school, high school, uni) depending on his age

```

'''
    age = int(input("Enter your age: "))

    if age >= 18:
        print("UNI")
    elif age >= 15:
        print("High-School")
'''

```

```

elif age >= 12:
    print("Middle-School")
else:
    print("School?")
'''

```

9. Write a program that calculate the age depending on his birthday and then print whether it's (child, man, elderly) and if the the age is negative, print an error

```

'''
from datetime import datetime
birth = input("Enter birthday (YYYY-MM-DD): ")
bd = datetime.strptime(birth, "%Y-%m-%d")
today = datetime.today()
age = today.year - bd.year - ((today.month, today.day) <
(bd.month, bd.day))
if age < 0:
    print("Error: Birthdate is in the future!")
elif age < 13:
    print("Age:", age, "child")
elif age < 65:
    print("Age:", age, "man")
else:
    print("Age:", age, "elderly")
'''

```

10. Write a program that swaps 2 variables if they are not equal

```

'''
a = input("Enter first value: ")
b = input("Enter second value: ")
if a != b:
    a, b = b, a
print("Values after swap:", a, b)
'''

```

11. Write a program to check if the date entered by the user is valid or not, so if the month is between 1-12 and the day is 1-31 then print it's valid, invalid other wise

```

'''

```

```

from datetime import datetime
y = int(input("Year: "))
m = int(input("Month (1-12): "))
d = int(input("Day (1-31): "))
try:
    datetime(y, m, d)
    print("Valid date.")
except:
    print("Invalid date.")
'''

```

12. Write a program to check if the equation from the second grade has 2 solutions or one or doesn't have depending on the following

$$\Delta = b^2 - 4 * a * c$$

```

'''
a = float(input("a: "))
b = float(input("b: "))
c = float(input("c: "))
delta = b**2 - 4*a*c
if delta < 0:
    print("No real solutions")
elif delta == 0:
    x = -b / (2*a)
    print("One solution:", x)
else:
    sqrt_d = delta**0.5
    x1 = (-b + sqrt_d) / (2*a)
    x2 = (-b - sqrt_d) / (2*a)
    print("Two solutions:", x1, x2)
'''

```

13. Write a program to check if the student is able to enter UNI from his age (above 18), and then check his result

if it's bigger or equal 80 and less than 100; print you can register on all majors  
 if it's between 60-80; print you can register on all majors except doctor  
 if it's less than 60 but bigger than 50; print he can register only on certain majors  
 else; print you can't register

```

...
age = int(input("Age: "))
score = float(input("Score: "))
if age <= 18:
    print("You can't register: age below 18.")
elif 80 <= score < 100:
    print("You can register on all majors.")
elif 60 <= score < 80:
    print("You can register on all majors except doctor.")
elif 50 < score < 60:
    print("You can register only on certain majors.")
else:
    print("You can't register")
...

```

14. Write a program to check if the user is able to loan depending on:  
 age must be bigger than 20  
 salary bigger than 50000  
 debts: none

```

...
age = int(input("Age: "))
salary = float(input("Salary: "))
has_debts = input("Any debts? (yes/no): ").strip().lower() ==
"yes"
if age > 20 and salary > 50000 and not has_debts:
    print("Loan approved.")
else:
    print("Loan denied.")
...

```

15. Write a program to display a list of majors with their fees, and then ask the user to chose a major and enter the money

if the money is bigger or equal the fees; print a message that he is in  
 else; print that he can't register

```

...
majors = {
    "CS": 60000,
    "Engineering": 65000,
    "Arts": 50000,

```



```

        "Business": 70000
    }
    print("Available majors and fees:")
    for m, fee in majors.items():
        print(m, ":", fee)
        choice = input("Choose a major: ")
        payment = float(input("Enter your payment: "))
        if choice in majors and payment >= majors[choice]:
            print("Registration successful.")
        else:
            print("Registration failed: insufficient funds or invalid
major.")
'''

```

## Loops

1. Write a program to print the even numbers in between 112-150 in a reverse

```

'''
    for i in range(150, 111, -1):
        if i % 2 == 0:
            print(i)
'''

```

2. Write a program to calculate the multiplier of a number from the user

```

'''
    n = int(input("Enter a number: "))
    factors = [i for i in range(1, n+1) if n % i == 0]
    print("Multipliers:", factors)
'''

```

3. Write a program to calculate the multiplication table of a number from the user

```

'''
    n = int(input("Enter a number: "))
    for i in range(1, 11):
        print(f"{n} x {i} = {n * i}")
'''

```

4. Write a program that prints all the letters

```

...
    for c in range(97, 123):
        print(chr(c))
...

```

5. Write a program to draw a triangle and the height is controlled from the user

```

...
    h = int(input("Enter triangle height: "))
    for i in range(1, h+1):
        print("*" * i)
...

```

6. Write a program to calculate the sum from 1 to a number from the user

```

...
    n = int(input("Enter a number: "))
    total = sum(range(1, n+1))
    print("Sum:", total)
...

```

7. Write a program to know whether a number from the user is prime number or not

```

...
    n = int(input("Enter a number: "))
    if n > 1:
        for i in range(2, int(n**0.5) + 1):
            if n % i == 0:
                print("Not prime")
                break
        else:
            print("Prime")
    else:
        print("Not prime")
...

```

8. Write a program to collect numbers from the user and print the biggest and smallest

```

...
    nums = list(map(int, input("Enter numbers separated by space:
").split()))
    print("Biggest:", max(nums))
    print("Smallest:", min(nums))
...

```

9. Write a program to print the month of the year, where the month is from the user

```

...
import calendar

m = int(input("Enter month number (1-12): "))

if 1 <= m <= 12:
    print(calendar.month(2025, m))
else:
    print("Invalid month")
...

```

10. Write a program to check the username and password from the user, if they match then print a message of success, otherwise give him 3 chances

```

...
correct_user = "admin"
correct_pass = "1234"
for attempt in range(3):
    user = input("Username: ")
    pwd = input("Password: ")
    if user == correct_user and pwd == correct_pass:
        print("Login successful")
        break
    else:
        print("Wrong credentials")
else:
    print("No more attempts")
...

```

11. Write a program to print numbers from 1-100 and skip the ones that are divisible to 4 and 5

```

...
for i in range(1, 101):
    if i % 4 == 0 or i % 5 == 0:
        continue
    print(i)
...

```

12. Write a program to print the month of the year for every month on the year from the user

```

...
import calendar

year = int(input("Enter year: "))

```

```

        for month in range(1, 13):
            print(calendar.month(year, month))
...

```

13. Write a program to print the all multiplication table

```

...
    for i in range(1, 11):
        for j in range(1, 11):
            print(f"{i} x {j} = {i*j}")
        print()
...

```

14. Write a guessing game using the random lib

```

...
    import random
    num = random.randint(1, 100)
    guess = None
    while guess != num:
        guess = int(input("Guess the number (1-100): "))
        if guess < num:
            print("Too low")
        elif guess > num:
            print("Too high")

    print("Correct!")
...

```

15. ... I did not undertand

16. ... I did not undertand

## Lists

1. Write a program to add ten numbers from the user then print the sum and biggest and smallest

```

...
    nums = [int(input(f"Num {i+1}: ")) for i in range(10)]
    print("Sum:", sum(nums))
    print("Biggest:", max(nums))

```

```

    print("Smallest:", min(nums))
...

```

## 2. Write a program to search inside a list

```

...
    items = input("Enter list items separated by space: ").split()

    target = input("Search for: ")
    if target in items:
        print(f"Found '{target}' at index", items.index(target))
    else:
        print(f"'{target}' not found")
...

```

## 3. Write a program to has list of numbers then:

- print the count of odds and evens
- print the odds or evens
- print the negatives or positives
- print the index of odds and evens

```

...
    lst = list(map(int, input("Enter numbers: ").split()))
    odds = [x for x in lst if x%2]
    evens = [x for x in lst if x%2==0]

    print("Odd count:", len(odds), "Even count:", len(evens))
    print("Odds:", odds)
    print("Evens:", evens)
    print("Positives:", [x for x in lst if x>=0])
    print("Negatives:", [x for x in lst if x<0])

    print("Indices of odds:", [lst[i] for I in odds])
    print("Indices of evens:", [lst[i] for I in evens])
...

```

## 4. Write a program that displays a list of programming languages then ask the user to enter number to operator on:

- Add item
- modify items value
- delete item
- clean it up
- other than that print an error

```

...
    langs = ["Python", "Rust", "Go", "JavaScript"]
    print("Current list:", langs)

```

```

    choice = input("Operation (add/modify/delete/clean):
").strip().lower()

    if choice=="add":
        langs.append(input("New item: "))
        print("Updated list:", langs)
    elif choice=="modify":
        i = int(input("Index to modify: "))
        val = input("New value: ")
        if 0<=i<len(langs):
            langs[i]=val
            print("Updated list:", langs)
        else:
            print("Error: invalid index")
    elif choice=="delete":
        i = int(input("Index to delete: "))
        if 0<=i<len(langs):
            langs.pop(i)
            print("Updated list:", langs)
        else:
            print("Error: invalid index")
    elif choice=="clean":
        langs.clear()
        print("List cleared:", langs)
    else:
        print("Error: unknown operation")
...

```

## Dictionaries

1. Write a program that has a dict tha contains the information of a doctor (id, name, age, email, major, address, place) then:

add contact phone number  
 modify the email  
 delete the age

```

...
doctor = {
    "id": "D123",
    "name": "Dr. Samir",
    "age": 45,
    "email": "samir@hospital.com",
    "major": "Cardiology",
    "address": "123 Health St.",

```

```

        "place": "General Hospital"
    }
    doctor["phone"] = "1234567890"
    doctor["email"] = "dr.samir@newmail.com"
    del doctor["age"]
    print(doctor)
...

```

2. Write a program to add student information (id, name, age, major, uni level) for 5 students

search by id  
delete a student by id

```

...
students = []
for _ in range(5):
    s = {}
    s["id"] = input("ID: ")
    s["name"] = input("Name: ")
    s["age"] = int(input("Age: "))
    s["major"] = input("Major: ")
    s["level"] = input("Uni Level: ")
    students.append(s)

search_id = input("Search student ID: ")

for student in students:
    if student["id"] == search_id:
        print("Found:", student)
        break
else:
    print("Not found")

delete_id = input("Delete student ID: ")
students = [s for s in students if s["id"] != delete_id]
print("Remaining students:", students)
...

```

## Functions

1. Write a function that asks the user two numbers and operation number, and print the result

```

...
def calculator():
    x = float(input("First number: "))
    y = float(input("Second number: "))
    op = input("Operation (+, -, *, /): ")
    if op == "+":
        print("Result:", x + y)
    elif op == "-":
        print("Result:", x - y)
    elif op == "*":
        print("Result:", x * y)
    elif op == "/":
        if y != 0:
            print("Result:", x / y)
        else:
            print("Cannot divide by zero")
    else:
        print("Invalid operation")

calculator()
...

```

2. Write a function like the exams system, it asks 3 questions and give the result to him

```

...
def exam():
    score = 0
    if input("Q1: 2+2? ") == "4":
        score += 1
    if input("Q2: Capital of France? ").lower() == "paris":
        score += 1
    if input("Q3: 5*3? ") == "15":
        score += 1
    print("Your score is", score, "out of 3")

exam()
...

```

3. Write a function that receives the student name and age, and see if he's able to register in UNI

```

...
def can_register(name, age):
    if age >= 18:
        print(f"{name} is eligible to register in UNI.")
    else:

```



```

        print(f"{name} is not eligible to register in UNI.")

    can_register(input("Name: "), int(input("Age: ")))
...

```

4. Write a function that asks the student to enter his name and 6 grades, then calculate the avg, then print a welcoming message if more than 50 else anything

```

...
def check_student():
    name = input("Enter your name: ")
    grades = [float(input(f"Grade {i+1}: ")) for i in range(6)]
    avg = sum(grades) / 6
    if avg >= 50:
        print(f"Welcome {name}, your average is {avg}")
    else:
        print(f"Sorry {name}, your average is {avg}")

    check_student()
...

```

5. Write a function that receives the operation number, if it's 1 then asks for a letter and print the ascii for it, and 2 for ascii to letter

```

...
def ascii_converter():
    op = int(input("Operation (1=char to ASCII, 2=ASCII to char): "))

    if op == 1:
        ch = input("Enter a character: ")
        print("ASCII:", ord(ch))
    elif op == 2:
        code = int(input("Enter ASCII code: "))
        print("Character:", chr(code))
    else:
        print("Invalid operation")

    ascii_converter()
...

```

6. Write a function that asks for numbers and return the biggest and print it

```

...
def find_biggest():

```

```

        nums = list(map(int, input("Enter numbers: ").split()))
        print("Biggest number is:", max(nums))

    find_biggest()
...

```

7. write a function that adds elements to a list that the user decided on then print them with a loop

```

...
    lst = []

    def add_elemn():
        how_much = int(input("How many are you going to add: "))
        for i in range(1, how_much + 1):
            lst.append(input(f"Enter the #{i} element: "))

        for item in lst:
            print(f"{i}: {item}")

    add_elemn()

...

```

## Shapes

having fun with just one line of code :)

1.

```

...
[print(x) for x in [" ".join("*" * i) for i in range(1, 6)]]
...

```

2.

```

...
[print(x) for x in [" ".join("*" * i) for i in range(5, 0, -1)]]
...

```

3.

```

...
list(map(lambda lst: print(" ".join(lst)), [[f"{i}" for i in
range(1, x + 1)] for x in range(1, 6)]))

```

```
...
```

4.

```
...
```

```
list(map(lambda lst: print("  ".join(lst)), [[f"{x}  " * x ] for x
in range(1, 6)]))
...
```

5.

```
...
```

```
sep = "    "; print("N", "N^2", "N^3", sep=sep); [print(x, x**2, x**3,
sep=sep) for x in range(1, 6)]
...
```

6.

```
too much, I know
...
```

```
sep_l = lambda: print("-" * 11); sep = " | "; sep_l(); [[print(*x,
sep=sep, end=" | \n"), sep_l()] for x in [list(range(y - 3, y)) for y
in range(4, 11, 3)]]
...
```