Python

Print

```
name = "Alex" #String
age = 21 #Integer
gpa = 3.4 #Float
job = False #Boolean

print(f"Hello {name}.") #Hello Alex.
print(f"You are {age} years old.") #You are 21 years old.
print(f"Your gpa is ({gpa}).") #Your score is (3.4).
if job:
    print("You have a job.")
else:
    print("You DON'T have a job.")
```

Variables

```
print("I'm coming for you.")

name = "Alex" #String
age = 21 #Integer
gpa = 3.4 #Float
job = False #Boolean
```

Type Casting

```
name = "Alex" #String
age = 21 #Integer
gpa = 3.4 #Float
job = False #Boolean

print(type(name)) #<class 'str'>
```

```
print(type(age)) #<class 'int'>
print(type(gpa)) #<class 'float'>
print(type(job)) #<class 'bool'>

gpa = int(gpa)
print(gpa) #3. Just int part.
age = float(age)
print(age) #21.0
age = str(age)
gpa = str(gpa)
print(gpa + age) #321.0
print(age + gpa) #21.03
```

Input

```
name = input("What is your name?: ")
print(f"Hello, {name}.")

age = int(input("How old are you?: "))
age = age + 1
print(f"Happy birthday! You're {age} years old.") #Happy birthday! You're 2
6 years old.
```

Mini Project 1-Calculator

```
area_width = float(input("Width of the area: "))
area_length = float(input("Length of the area: "))
material_thickness = float(input("Thickness of the material: "))
material_length = float(input("Length of the material: "))
if material_thickness == 0.5:
    material_weight = 3.7
else:
    material_weight = 2.9
print(f"You need {int((area_length*area_width*1.3)/(material_length*0.9))}
```

```
materials and it's approximately equals to {material_length*material_weight
*(int((area_length*area_width)/(material_length*0.9)))} kilograms.")
```

Mathematical Operators

```
import math

apple = 0
#-----------------------------------------------------------------
apple = apple + 1 #Adds 1
apple += 2 #Adds 2
print(apple)

apple = apple - 1 #Removes 1
apple -= 1 #Removes 1
print(apple)

apple = apple * 2 #Multiples with 2
apple *= 2 #Multiples with 2
print(apple)

apple = apple / 2 #Divides by 2
apple /= 2 #Divides by 2
print(apple)

apple = apple ** 2 #Power of 2
apple **= 2 #Power of 2
print(apple)

remainder = apple % 2 #Equals to what last from apples divided by two
#-----------------------------------------------------------------
x = 3.14
y = -4
z = 5
#-----------------------------------------------------------------
result = round(x) #Nearest integer
print(result) #3
```

```
distance = abs(y) #Distance from zero
print(distance) #4

value = pow(4, 3) #4 * 4 * 4 = 64
print(value)

biggest = max(x, y, z) #Chooses the biggest one
print(biggest) #5

smallest = min(x, y, z) #Chooses the smallest one
print(smallest) #-4
#---------------------------------------------------------------------
print(math.pi)
print(math.e)

x = 16
result_1 = math.sqrt(x)
print(result_1)

y = 2.3
result_2 = math.ceil(y)
print(result_2)

z = 6.8
result_3 = math.floor(z)
print(result_3)
#---------------------------------------------------------------------
#Circle Circumference Calculator
#radius = float(input("Enter radius: "))
#circumference = round(radius*2*math.pi, 2)
#print(f"Your circle's circumference is approximately {circumference}cm
(s)")
#---------------------------------------------------------------------
#Circle Area Calculator
#radius = float(input("Enter radius: "))
#area = round(pow(radius, 2) * math.pi, 2)
#print(f"Your circle's area is approximately {area}cm^2(s)")
```

```
#-----------------------------------------------------------------
#Triangle hypotenus
a = float(input("Enter side A: "))
b = float(input("Enter side B: "))
c = math.sqrt(pow(a, 2) + pow(b, 2))
print(f"Side C is {c}")
```

If Statements

```
age = int(input("Enter age: "))
if age >= 18 | age < 90 | age > 0: # "|" and "and" mean same thing
    print("You can apply for this job.")
elif age <= 0:  # <= smaller or equal
    print("Bro🩻")
elif age >= 90: # >= bigger or equal
    print("Fossil ass nigga get into my Audi A6 2.0 TDI's fuel tank unc.")
else:
    print("You can not apply for this job.")

response = input("Would you like some food? (Y/N): ")
if response == "Y" or response.lower() == "y": # == equal or not
    print("Enjoy your food!")
elif response == "N" or response.lower() == "n":
    print("Have a nice day!")
else:
    print("Bro give a real answer.")

name = input("Enter your name: ")
if name == "":
    print("Bro give your NAME")
else:
    print(f"welcome {name}")

for_sale = True
if for_sale:
    print("This item for sale!")
```

```
else:
    print("This item not for sale.")
```

Mini Project 2-Calculator

```
thing = input("Enter an operator (/ * - +): ")
number_1 = float(input("Enter first number: "))
number_2 = float(input("Enter second number: "))
if thing == "+":
    print(round(number_1 + number_2, 4))
elif thing == "-":
    print(round(number_1 - number_2, 4))
elif thing == "*":
    print(round(number_1 * number_2, 4))
elif thing == "/":
    print(round(number_1 / number_2, 4))
else:
    print(f"{thing} is not a valid operator.")
```

Mini Project 3-Weight Converter

```
weight = float(input("Enter weight: "))
unit = input("Enter unit (kg/l): ")

if unit == "kg":
    weight *= 2.205
    print(f"{weight / 2.205}{unit} is equal to {round(weight, 4)} lbs")
elif unit == "l":
    weight/= 2.205
    print(f"{weight * 2.205}{unit} is equal to approximately {round(weight,
4)} kgs")
else:
    print(f"{unit} is not valid.")
```

Mini Project 4-Temperature Converter

```
unit = input("Select unit (C/F): ")
temperature = float(input("Select temperature: "))
if unit == "F":
    print(f"{temperature} Fahrenheit is equals to approximately {round((temp
erature - 32) * (5/9), 4)} Celsius.")
elif unit == "C":
    print(f"{temperature} Celsius is equals to approximately {round((tempera
ture * (9/5)) + 32, 4)} Fahrenheit")
```

Logical Operators

```
#OR
temperature = 23
rainy = True
if temperature > 32 or rainy == True or temperature < 5: #Even one of the i
nputs is enough
    print("The outdoor event has been cancelled.")
else:
    print("The outdoor event is still scheduled.")

#AND
temp = 30
sunny = False
if  temp > 28 and not sunny:
    print("Outside is hot and cloudy.")
elif temp > 28 and sunny:
    print("Outside is hot and sunny.")
elif temp < 5 and sunny:
    print("Outside is cold and sunny.")
elif temp < 5 and not sunny:
    print("Outside is cold and cloudy.")
elif 28 > temp > 5 and sunny:
    print("Outside is warm and sunny.")
```

```
elif 28 > temp > 5 and not sunny:
    print("Outside is warm and cloudy.")
```

Conditional Expression (Ternary Operator)

```
number = -2
a = 9
b = 10

print("Positive" if number > 0 else "Negative")

result = "Even" if number % 2 == 0 else "Odd"
print(result)

bigger_number = a if a > b else b
print(bigger_number)
```

String Methods

```
name = input("What is your name?: ")
print(len(name)) # Includes " "
space = name.find(" ") #Starts searching from the beginning.
letter_n = name.rfind("n") #>Starts searching from the end.
letter_q = name.find("q") #If there are no letters that we're looking for, retur
ns "-1"
print(space) # 0, 1, 2, 3, "4"
print(letter_n) # 12, 11, "10"
print(letter_q) # -1
print(name.capitalize()) #Makes the first letter bigger.
print(name.upper()) #RYAN GOSLING
print(name.lower()) #ryan gosling
print(name.isdigit()) #If string contains just numbers, returns true.
print(name.isalpha()) #If string contains just letters, returns true. Space cau
ses to return false.
```

```
print(name.count("n")) #Counts the character that we give.
print(name.replace("n", "I HATE NIGGERS"))
```

Exam 1-Username Validator

```
username = input("Enter your username: ")
if not username.isalpha():
    print("Your username must not contain numbers or special characters.")
elif len(username) > 12:
    print("Your username must be shorter than 13 characters.")
else:
    print(f"Welcome {username}.")
```

Indexing

```
print(credit_card_number[0 : 4]) #Start index is inclusive, end index is exclu
sive.
print(credit_card_number[5 : ]) #From start index to the end of the line.
print(credit_card_number[ : 9]) #From the beginning of the sentence to the
end index.
print(credit_card_number[-1]) #Prints end of the line. "6"
print(credit_card_number[-2]) #5
print(credit_card_number[::2]) #Starts with the first letter. "13-6891-46"
print(credit_card_number[-4::]) #3456
print(credit_card_number[::-1]) #Reverse. "6543-2109-8765-4321"
```

Format Specifiers

```
price_1 = 3.14159
price_2 = -978.68
price_3 = 12.34
price_4 = 16249027.48

print(f"Price 1 is {price_1:.2f}") #"3.14". Rounds the last number.
```

```
print(f"Price 2 is {price_2:.3f}") #-978.680
print(f"Price 3 is {price_3:10}") #Price 3 is      12.34
print(f"Price 3 is {price_3:010}") #Price 3 is 0000012.34
print(f"Price 3 is {price_3:<10}!") #Price 3 is 12.34     !
print(f"Price 3 is {price_3:^10}!") #Price 3 is   12.34   !
print(f"Price 3 is {price_3:+}!") #If the number is positive, adds "+". Else ad
ds "-".
print(f"Price 4 is {price_4:+,.1f}") #16,249,027.48
```

While Loop

```
name = input("Enter your name: ")
while name == "":
    print("Please enter your username.")
    name = input("Enter your name: ")
print(f"Welcome {name}")
```

Mini Project 5 - Compound Interest Calculator

```
principle = 0
rate = 0
time = 0

while principle <= 0:
    principle = float(input("Enter your principle: "))
    if principle <= 0:
        print("Your principle value must be greater than 0.")

while rate <= 0:
    rate = float(input("Enter your interest rate: "))
    if rate <= 0:
        print("Your interest rate value must be greater than 0.")

while True:
```

```
    time = int(input("Enter your time in years: "))
    if time <= 0:
        print("Your time value must be greater than 0.")
    else:
        break

print(f"Your principle equals to {principle}")
print(f"Your interest rate equals to {rate}")
print(f"Your time in years equals to {time}")
total = principle * pow((1 + rate / 100), time)
print(f"Compound interest equals to {total:.2f}")
```

For Loop

```
for x in reversed(range(1, 11, 2)):
    print(x) #1, 3, 5, 7, 9

credit_card_number = "1234-5678-9012-3456"
for x in credit_card_number:
    print(x) #1, 2, 3, 4, -, 5, 6, 7, 8, -, 9, 0, 1, 2, - , 3, 4, 5, 6

for x in range(1,21):
    if x == 13:
        continue
    else:
        print(x)
```

Mini Project 6 - Countdown

```
import time

count_time = int(input("Enter your time in seconds: "))
#for i in reversed(range(0, count_time + 1)): print(i) time.sleep(1)

for i in range(count_time, 0, -1):
```

```
    seconds = i % 60
    minutes = int(i / 60) % 60
    hours = int(i / 3600)
    print(f"{hours:02}:{minutes:02}:{seconds:02}")
    time.sleep(1)
```

Nested Loops

```
rows = int(input("Number of rows: "))
columns = int(input("Number of columns: "))
symbol = input("Enter a symbol: ")


for x in range(rows):
    for i in range(columns):
        print(symbol, end=" ")
    print()
```

Collections

```
fruits = ["apple", "pear", "coconut"]
print(fruits[::-1])
print(fruits[::2])
for fruit in fruits:
    print(fruit)
print(dir(fruits))
print(help(fruits))
print("pineapple" in fruits)
fruits[0] = "banana"
fruits.append("kiwi")
fruits.remove("banana")
fruits.insert(0, "apple")
fruits.sort()
fruits.clear()
print(fruits.index("apple"))
```

```
print(fruits)

cars = {"honda", "bmw", "toyota", "cadillac", "audi", "porsche"}
print(len(cars))
cars.add("mclaren")
cars.remove("cadillac")
cars.pop() #Removes the first element
cars.clear()
print(cars) #Every time you run this code, another sort you will see becaus
e "Set" is unordered.

continents = ("Asia", "Europe", "South America", "North America", "Antarcti
ca", "Australia", "Africa")
print(continents.index("North America"))
print(continents.count("McLaren"))
for continent in continents:
    print(continent, end="/")
```

Shopping Cart Program

```
foods = []
prices = []
total = 0

while True:
    food = input("Enter a food to buy (q to quit): ")
    if food.lower() == "q" :
        break
    else:
        price = float(input(f"Enter the price of {food}: $"))
        foods.append(food)
        prices.append(price)
print("------------YOUR CART------------")
for food in foods:
    print(food, end=" - ")

for price in prices:
```

```
    total += price

print(f"Your total is: {total}")
```

2D Lists

```
fruits =     ['apple', 'banana', 'orange']
vegetables = ['celery', 'carrot', 'potato']
meats =      ["chicken", "cow", "sheep"]

groceries = [fruits, vegetables, meats]
print(groceries) #[['apple', 'banana', 'orange', 'strawberry'], ['celery', 'carro
t', 'potato'], ['chicken', 'cow', 'sheep']]
print(groceries[0]) #['apple', 'banana', 'orange', 'strawberry']
print(groceries[0][2]) #First one decides to row, second one decides to col
umn
for collection in groceries:
    for food in collection:
        print(food, end=" ")
    print()

groceries_2 = [['apple', 'banana', 'orange'],
               ['celery', 'carrot', 'potato'],
               ["chicken", "cow", "sheep"]]


numpad = ((1, 2, 3),
          (4, 5, 6),
          (7, 8, 9),
          ("*", 0, "#"))
for row in numpad:
    for num in row:
        print(num, end="  ")
    print()
```

Mini Project 7 - Quiz Game

```
questions = ("1. How many elements are in the periodic table?",
             "2. Which animal lays the largest eggs?",
             "3. What is the most abundant gas in Earth's atmosphere?",
             "4. How many bones are in the human body?",
             "5. Which planet in the solar system is the hottest?")
options = (("A: 116","B: 117","C: 118","D: 119"),("A:Penguins","B: Sharks","C: T
urtles","D: Ostrich"),
           ("A: Nitrogen","B: Oxygen","C: carbon-Dioxide","D: Hydrogen"),
           ("A: 206","B: 207","C: 208","D: 209"),
           ("A: Mercury","B: Mars","C: Saturn","D: Venus"))
answers = ("C","D","A","A","D")
guesses = []
score = 0
question_num = 0

for question in questions:
    print("--------------------------------------")
    print(question)
    for option in options[question_num]:
        print(option)
    guess = input("Enter (A, B, C, D): ").upper()
    guesses.append(guess)
    if guess == answers[question_num]:
        score += 1
        print("Correct!")
    else:
        print(f"Incorrect! The correct answer is {answers[question_num].uppe
r()}!")
    question_num += 1
print("------------------------------")
print("|          RESULTS         |")
print("------------------------------")
print("Answers: ", end="")
for guess in guesses:
    print(guess.upper(), end=", ")
print()
```

```
print("Guesses: ", end="")
for answer in answers:
    print(answer.upper(), end=", ")
print()
print(f"The total score is {score}/5!")
print("------------------------------")
```

Dictionaries

```
capitals = {"USA":"Washington D.C.",
            "Turkey":"Ankara",
            "Russia":"Moscow"}
print(capitals.get("Russia")) #Moscow
print(capitals.get("Japan")) #None

capitals.update({"Germany":"Berlin"}) #{'USA': 'Washington D.C.', 'Turkey':
'Ankara', 'Russia': 'Moscow', 'Germany': 'Berlin'}
capitals.update({"USA":"Detroit"}) #{'USA': 'Detroit', 'Turkey': 'Ankara', 'Rus
sia': 'Moscow'}
capitals.pop("USA") #{'Turkey': 'Ankara', 'Russia': 'Moscow'}
capitals.popitem() #Removes the last element. {'USA': 'Washington D.C.', 'T
urkey': 'Ankara'}
keys = capitals.keys() #dict_keys(['USA', 'Turkey', 'Russia'])
print(capitals)
for key in capitals.keys():
    print(key, end=", ") #USA, Turkey, Russia,
print()

for value in capitals.values():
    print(value, end=", ") #Washington D.C., Ankara, Moscow,
print()

items = capitals.items()
for key, value in capitals.items():
    print(f"{key}: {value}")
```

Mini project 8 - Concession Stand Program

```
menu = {"Pizza": 2.99,
        "Popcorn": 3,
        "Burger": 1.99,
        "Fries": 2.49}
cart = []
total = 0

print("-------- MENU --------")
for key, value in menu.items():
    print(f"{key:10}: {value:.2f}")
print("-------- MENU --------")
while True:
    food = input("What food do you want to buy? (q to quit): ")
    if food.upper() == "Q":
        break
    elif menu.get(food) is not None:
        cart.append(food)

for i in cart:
    total += menu.get(i)
    print(f"{i}: {menu.get(i):.2f}")
print(f"The total price is ${total:.2f}")
```

Random Library

```
import random

number = random.randint(1,6)
print(number)
number = random.random()
print(number)
options = ("rock", "paper", "scissors")
print(random.choice(options))
```

```
cards = ["2","3","4","5","6","7","8","9","10","J","Q","K","A"]
random.shuffle(cards)
print(cards)
```

Mini Project 9-Number Guessing Game

```
import random
while True:
    difficulty = input("Choose a difficulty level (1, 2, 3, 4, 5): ")
    if difficulty.isdigit():
        number = random.randint(1, int(difficulty) * 50)
        break
    else:
        print("Your difficulty choice must be an integer and between 1 and 5!")


guesses = 1
while True:
    guess = input(f"{guesses}. Guess a number between 1 and {int(difficulty)
* 50}: ")
    if guess.isdigit() and 1 <= int(guess) <= int(difficulty) * 50:
        if int(guess) == number:
            print(f"You guessed the correct number ({number})!")
            print(f"You've guessed the correct number in {guesses} guesses!")
            break
        else:
            if int(guess) - number >= 20 and guess != number:
                print("Too high!")
                guesses += 1
            elif 0 < int(guess) - number < 20 and guess != number:
                print("High!")
                guesses += 1
            elif number - int(guess) >= 20 and guess != number:
                print("Too low!")
                guesses += 1
            elif 0 < number - int(guess) < 20 and guess != number:
                print("Low!")
```

```
            guesses += 1
    else:
        print(f"Your guess must be an integer and between 1 and {int(difficult
y) * 50}!")
```

Mini Project 10 - Dice Roller

```
import random
dice_art = {
    1: ("┌─────────┐",
        "│         │",
        "│    ●    │",
        "│         │",
        "└─────────┘"),
    2: ("┌─────────┐",
        "│  ●      │",
        "│         │",
        "│      ●  │",
        "└─────────┘"),
    3: ("┌─────────┐",
        "│  ●      │",
        "│    ●    │",
        "│      ●  │",
        "└─────────┘"),
    4: ("┌─────────┐",
        "│  ●   ●  │",
        "│         │",
        "│  ●   ●  │",
        "└─────────┘"),
    5: ("┌─────────┐",
        "│  ●   ●  │",
        "│    ●    │",
        "│  ●   ●  │",
        "└─────────┘"),
    6: ("┌─────────┐",
        "│  ●   ●  │",
```

```
        "│  ●  ●  │",
        "│  ●  ●  │",
        "└─────────┘")
}
dice = []
total = 0
num_of_dice = int(input("How many dice?: "))



for i in range(num_of_dice):
    dice.append(random.randint(1, 6))

#for die in range(num_of_dice):
#    for line in dice_art.get(dice[die]):
#        print(line)

for line in range(5):
    for die in dice:
        print(dice_art.get(die)[line], end="  * ")
    print()

for die in dice:
    total += die

print(dice)
print(f"total: {total}")
```