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Introduction to Computers and Programming, SE Programme

Direction Lab #4

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1. Write a Python program that prompts the user and takes a score (in the range from 0 to 100) from user, then it determines and prints out the grade according to the criteria below.

Grade A if 80 <= score <= 100
Grade B if 70 <= score < 80
Grade C if 60 <= score < 70
Grade D if 50 <= score < 60
Grade F if score < 50

Example

```
Enter a score: 70
Your grade: B
```

```
score = int(input("Enter a score: "))

if score in range (80,100):
   print("Your grade: A")
elif score in range (70,80):
   print("Your grade: B")
elif score in range (60,70):
   print("Your grade: C")
elif score in range (50,60):
   print("Your grade: D")
elif score in range (0,50):
   print("Your grade: F")
```

2. Write a Python program to read a number from the keyboard if it is a real number, ask the user whether he/she wants to display the number in a floating point or a scientific format, then the program displays the number in that format; but if it is an integer, ask the user whether he/she wants to display the number in a binary, octal, hexadecimal, or decimal format, then the program displays the number in that format.

```
user_num = eval(input("Enter a num: "))
if user_num < 0:
    print("Invalid Number")

elif (type(user_num)==float):
    option_1 = int(input("floating point(choose 1) or scientific format(choose 2): "))
    if (option_1 == 1):
        print(f"{user_num:f}")
    elif (option_1 == 2):
        print(f"{user_num:e}")
    else:
        print("Not valid number")
elif (type(user_num)==int):
    option_2 = int(input("Binary(choose 1),Octal(choose 2),Hex(choose 3) or Decimal format(choose 4): "))
    if (option_2 == 1):
        print(bin(user_num))
    elif (option_2 == 2):
        print(oct(user_num))
    elif (option_2 == 3):
        print(hex(user_num))
    elif (option_2 == 4):
        print(user_num)
    else:
        print("Not valid number")
```

3. BMI Calculator

Write a Python program which asks from the user his/her **name**, **age**, **height** (in cm) and **weight** (in kg). The program will calculate the user's **body mass index (BMI)** using the formula:

$$BMI = \frac{weight(\text{in } kg)}{(height(\text{in } m))^2}$$

The user will then be categorized as **underweight** / **normal** / **overweight** based on his/her BMI using the following table:

BMI Category Chart			
Age	Underweight	Normal	Overweight
Under 17	<15	15-20	>20
17 – 35	<18	18-24	>24
Over 35	<19	19-26	>26

Example

By running the program, the user will interact with the program in the following sequence:

```
Enter your name: Mr. Fit
Enter your age: 37
Enter your weight in Kg: 70
Enter your height in cm: 183
Your body mass index (BMI) is 20.902385858
Mr. Fit, you are normal.
```

The underlined texts are what the user inputs.

Hint: To avoid errors in calculation, the inputs for weight and height should be converted from **string** to **float** not to **int**.

```
username = input("Enter your name: ")
user_age = int(input("Enter your age: "))
weight = float(input("Enter your weight in KG: "))
height = float(input("Enter your height in CM: "))

bmi = weight/((height/100)**2)
under = (f"{username}, you are underweight")
normal = (f"{username}, you are normal")
over = (f"{username}, you are overweight")

print(f"Your body mass index (BMI) is {bmi}")

if user_age < 17:
    if bmi < 15:
        print(under)
    elif bmi >= 15 or bmi <= 20 :
        print(normal)
    elif bmi > 20.0:
        print(over)
    else:
        print("Invalid")
elif user_age in range(17, 36):
    if bmi < 18:
        print(under)
    elif bmi >= 18 or bmi <=24:
        print(normal)
    elif bmi > 24:
        print(over)
    else:
        print("Invalid")
elif user_age > 35:
    if bmi < 19:
        print(under)
    elif bmi >=19 or bmi <=26:
        print(normal)
    elif bmi > 26:
        print(over)
    else:
        print("Invalid")
else:
    print("send help")
```

4. Write a Python program that repeats reading an integer 5 times and each time it gets one integer it prints a summation of consecutive positive numbers (or consecutive negative numbers). The accumulation of the results will be reset to zero if the following number has a different sign from the latest number.

Example

```
Enter an integer: 2
Current sum:      2

Enter an integer: 10
Current sum:      12

Enter an integer: 7
Current sum:      19

Enter an integer: -2
Current sum:      -2

Enter an integer: -5
Current sum:      -7
```