ASSIGNMENT (30/01/2023)

1. Write a program to accept percentage from the user and display the grade according to the following criteria:

Marks	Grade
>90	A
>80 and <=90	B
>=60 and <=80	C
below 60	D

Code:

```
marks = float(input("Enter the marks:"))
if marks > 90:
    grade = "A"
elif marks > 80 and marks <= 90:
    grade = "B"
elif marks >= 60 and marks <= 80:
    grade = "C"
else:
    grade = "D"
print("Grade: " + grade)
```

OUTPUT:

```
Enter the marks: 65
Grade: C
```

2. Write a program to accept the cost price of a bike and display the road tax to be paid according to the following criteria

Tax	Cost Price(in Rs)
15%	>100000
10%	>50000 and <= 100000
5%	< = 50000

CODE:

```
cost_price = float(input("Enter cost price of bike (in Rs): "))

if cost_price > 100000:

    road_tax = cost_price * 0.15

elif cost_price > 50000 and cost_price <= 100000:

    road_tax = cost_price * 0.10

else:

    road_tax = cost_price * 0.05

print("Road tax to be paid (in Rs): " + str(road_tax))
```

OUTPUT:

```
Enter cost price of bike (in Rs):  50001
Road tax to be paid (in Rs): 5000.1
```

3. Accept any city from the user and display monuments of that city.

City	Monument
Delhi	Red Fort
Agra	Taj Mahal
Jaipur	Jal Mahal

CODE:

```
city = input("Enter a city: ")
if city.lower() == "delhi":
    print("Monuments in Delhi:")
    print("Red Fort")
elif city.lower() == "agra":
    print("Monuments in Agra:")
    print("Taj Mahal")
elif city.lower() == "jaipur":
    print("Monuments in Jaipur:")
    print("Jal Mahal")
else:
    print("Sorry, we do not have information about the monuments in that city.")
```

OUTPUT:

```
Enter a city:  KOLKATA
Sorry, we do not have information about the monuments in that city.
```

4. Check how many times a given number can be divided by 3 before it is less than or equal to 10.

CODE:

```
def count_divisions(number, divisor):
        count = 0
                while number % divisor == 0:
                        number //= divisor
                        count += 1
                return count
  n=int(input("enter a number"))
  result = count_divisions(n, 3)
  print(result)
```

OUTPUT:

```
enter a number 30
1
```

5. Why and When to Use while Loop in Python give a detailed description with example

A while loop in Python is used to execute a block of code repeatedly as long as a certain condition is true. It is a type of loop that continues to run as long as the condition is true and stops running when the condition becomes false. The syntax for a while loop is:

while condition: # code to execute

Here are some situations when you might use a while loop in Python:

1. When you want to repeat a block of code until a certain condition is met. For example, you might use a while loop to keep prompting the user for input until they provide a valid response.

   CODE:

   ```
   valid_input = False
   while not valid_input:
   user_input = input("Enter a number: ")
   if user_input.isdigit():
           valid_input = True
           num = int(user_input)
   else:
           print("Invalid input. Please enter a number.")
   ```

   OUTPUT:

   ```
   Enter a number: 10
   ```

2. When you want to perform a task a specific number of times. For example, you might use a while loop to iterate through a list until a certain condition is met.

CODE:

```
my_list = [1, 2, 3, 4, 5]
index = 0
while index < len(my_list):
        print(my_list[index])
        index += 1
```

OUTPUT:

```
1
2
3
4
5
```

3. When you want to continuously perform a task until the program is interrupted or stopped. For example, you might use a while loop to run a game loop that updates the game state and redraws the screen.

6. Use nested while loop to print 3 different patterns.

Pattern 1: A right triangle made of asterisks

CODE:

```
i = 1
while i <= 5:
j = 1
while j <= i:
       print("*", end="")
       j += 1
print()
i += 1
```

OUTPUT:

```
*
**
***
****
*****
```

Pattern 2: A square made of asterisks

CODE:

```
i = 1
while i <= 5:
       j = 1
          while j <= 5:
              print("*", end="")
              j += 1
       print()
       i += 1
```

OUTPUT:

```
*****
*****
*****
*****
*****
```

Pattern 3: A reverse right triangle made of asterisks

CODE:

```
i = 5
while i >= 1:
   j = 1
       while j <= i:
          print("*", end="")
          j += 1
       print()
       i -= 1
```

OUTPUT:

```
*****
****
***
**
*
```

7. Reverse a while loop to display numbers from 10 to 1.

CODE:

```
i = 10
while i >= 1:
   print(i)
    i -= 1
```

OUTPUT:

```
10
9
8
7
6
5
4
3
2
1
```