CS1302 - Lecture 4 Iteration
(Dr Helena WONG)

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Warm up:
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Q1 Try the following:

```
type(3), type('p')                  # outputs (int, str)
```

Q2 Complete the blank:

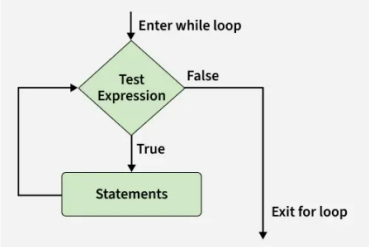
```
type(3), type('p'), type((3, 'p'))  # outputs ____________
```

Q3 Try the following:

```
while input('Input something please:') == "":
    print("I'm waiting")
```

Understanding:

While Loop Flowchart



https://www.geeksforgeeks.org/python/python-while-loop/

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Break-time activities:
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Try the following:

(A)

```
while input('Input something please:') == "":
    print("I'm waiting")
```

(B)

```
while bool(input('Input something please:')) == False:
    print("I'm waiting")
```

```
====
while not input('Input something please:'):
    print("I'm waiting")
```

```
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# try: change print("I'm waiting") to pass
====

while not text := input('Input something please:'):
    print("I'm waiting")
print("Thanks!  You said "+text)
print(f"Thanks!  You said {text}.")
```

(C) Using flags, often named is_..., has_...

```
is_valid = False
while is_valid == False:
    num=input("give me a number: ")
    if num.isdigit():
        is_valid = True

print('You entered: ', num)
```

try: using while True and break instead of flags

```
while True:
    num=input("give me a number: ")
    if num.isdigit():
        break

print('You entered: ', num)
```

Warning: use break/continue consciously. Ask: it improves the code's quality?
"trial-and-error" often worsen the case. 😂

(D)

```
num_cheating = 0
for course in range(1, 6):
    if input(str(course)+": Cheating [y/n]? ")=='n':
        continue;
    print("One cheating record\n")
    num_cheating += 1

    if num_cheating==3:
        print("Terminated!!")
        break;
else:
    if num_cheating==0:
        print("Graduate without cheating record")
    else:
        print("Graduate with", num_cheating, "cheating record(s)")
```

(E) Among 1 to 20, which numbers are prime and which are not prime?

```
prime: 2,3,5,7, __________
not prime: 1,4,6,8,9,10, __________
```

Among 1 to 20, which numbers are composite and which are not composite numbers?

```
composite numbers: 4,6,8,9,10, __________
not composite numbers: 1,2,3,5,7, __________
```

NOTE 1: Why is 1 not a Prime Number?

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https://byjus.com/maths/is-1-a-prime-number/#:~:text=For%20a%20number%20to%20be,is%20not%20a%20prime%20number.

For a number to be called as a prime number, it must have only two positive factors. Now, for 1, the number of positive divisors or factors is only one i.e. 1 itself. So, number one is not a prime number.

NOTE 2: Composite numbers 1 to 10: 4,6,8,9,10
(1 is not a composite number)

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https://byjus.com/maths/composite-numbers/#:~:text=1%20is%20not%20a%20composite,and%203%20are%20not%20composite.

The positive integers having more than two factors are composite numbers. (i.e. 3 or more factors)