

What are loops?

- A loop is a control structure that is used to perform a set of instructions for a specific number of times.

Loops are a programming element that repeat a portion of code a set number of times until the desired process is complete. Repetitive tasks are common in programming, and loops are essential to save time and minimize errors.

```
print("helicopter shot")
print("helicopter shot")
print("helicopter shot")
print("helicopter shot")
print("helicopter shot")
```

```
helicopter shot
helicopter shot
helicopter shot
helicopter shot
helicopter shot
```

While loop

- The while loop keeps iterating over a certain set of operations as long as a certain condition holds True.

Shopping list example

image

```
# initialize
```

```
count = 0
```

```
# Condition
```

```
while count <= 5:
```

```
    # do some work
```

```
    print("Helicopter shot")
```

```
    # increment
```

```
    count += 1
```

```
Helicopter shot
Helicopter shot
Helicopter shot
Helicopter shot
```

```
Helicopter shot  
Helicopter shot
```

```
# initialize  
count = 0
```

```
while count < 5:  
    # do some work  
    print("Helicopter shot")  
  
    # increment  
    count += 1
```

```
Helicopter shot  
Helicopter shot  
Helicopter shot  
Helicopter shot  
Helicopter shot
```

```
print(1 <= 5)
```

```
True
```

```
print(5<=5)
```

```
True
```

Print numbers from 1 to 10

```
# Quiz
```

```
num = 1
```

```
while num <= 10:  
    print(num)  
  
    num += 1
```

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

Print numbers from 10 to 1

```
num = 10
```

```
while num >= 1:  
    print(num)  
  
    num -= 1
```

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

```
# quiz
```

```
# count = 1  
# while count <= 10:  
#     print(10)
```

```
N = int(input())  
i = N  
while i >= 1:  
    print(i)  
    i -= 1
```

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

2
1

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

Print all even numbers between 2 to 10

check for a number if it is even

Quiz 2

```
2 % 2 == 0
```

True

```
3 % 2 == 0
```

False

```
n = int(input())
```

```
if n % 2 == 0:
    print(n)
```

6

6

```
rahul = 2
```

```
while rahul <= 10:
```

check for even

```
if rahul % 2 == 0:
    print(rahul)
```

```
    rahul += 1
```

2
4
6
8
10

```
num = 2

while num <= 10:
    print(num)

    num += 2
```

```
2
4
6
8
10
```

Print all Odd number from 1 to 10

odd

```
start = 1

while start <= 10:
    print(start)
    start += 2
```

```
1
3
5
7
9
```

Quizzes

```
N = 2
while i <= N:
    print(i)
    i += 1
```

```
print(5)
```

```
-----
-----
NameError                                Traceback (most recent call
last)
/var/folders/zn/hkv6562d6_d30glfs8yc76900000gn/T/ipykernel_39668/17336
1336.py in <module>
      1 N = 2
```

```
----> 2 while i <= N:
      3     print(i)
      4     i += 1
      5
```

NameError: name 'i' is not defined

Print all numbers from 1 to 10 in a single line

Go for print statement

```
num = 1
```

```
while num <= 10:
    print(num)
```

```
    num += 1
```

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

\n is a next line character

```
print(2,3,4,5,6, sep="\n")
```

```
2
3
4
5
6
```

```
num = 1
```

```
while num <= 10:
    print(num, end=" ")
```

```

    num += 1
1 2 3 4 5 6 7 8 9 10
num = 1
while num <= 10:
    if num == 10:
        print(num, end="")
    else:
        print(num, end=" -> ")
    num += 1
1 -> 2 -> 3 -> 4 -> 5 -> 6 -> 7 -> 8 -> 9 -> 10

```

Quizes

```

N = 5
i = 2
while i <= N:
    if i % 2 == 0:
        print(i)
    i += 1
2
4
print("a",end="b")
print("b", end="c")
abbc

```

Print multiple table of 4 in a single line

```

start = 4
while start <= 40:
    print(start, end=" ")
    start += 4
4 8 12 16 20 24 28 32 36 40

```

Print multiple table of N

```
N = int(input())

start = N

while start <= N * 10:
    print(start)

    # increment
    start += N
```

19

19

38

57

76

95

114

133

152

171

190

Taking T inputs from user

```
# T = int(input())
# i = 1
# while i <= T:
#     n = int(input())
```

```
T = int(input())
i = 1
while i <= T:
    n = int(input())
```

i += 1

3

12

23

34

Take T integers as input and print their tables

```
T = int(input())
i = 1
while i <= T:
    n = int(input())

    i += 1
```

```
3
12
1
13
```

```
N = int(input())
```

```
start = N
```

```
while start <= N * 10:
    print(start)
```

```
    # increment
    start += N
```

```
13
```

```
13
26
39
52
65
78
91
104
117
130
```

Final code

```
T = int(input())
i = 1
while i <= T:
    n = int(input())
    # i is increment for outer loop
    i += 1
```

```
# Print table for input n
start = n
while start <= n*10:
    print(start, end=" ")
    start += n
```

2

13

13 26 39 52 65 78 91 104 117 130

14

14 28 42 56 70 84 98 112 126 140

```
# Quiz
```

```
T = int(input())
i = 1
while i <= T:
    n = int(input())
    print(n)
    i += 1
```

4

6

6

4

4

3

3

1

1

D0 hit and Trial at home under the supervision of Stackoverflow