Control Flow using the **While** Loop

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### The **while** Loop

If **False**...

```python
while (guessesTaken < 6):
    print('Take a guess.')
    guess = input()
    guess = int(guess)
    guessesTaken = guessesTaken + 1
    if (guess < number):
        print('Your guess is too low.')
    if (guess > number):
        print('Your guess is too high.')
    if (guess == number):
        break
```

If **True**...

...go to the first statement past the loop block.

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...go to the first statement inside the loop block.
A Simple **while** Loop

```python
n = 4
while (n<10):
    print(n)
    n = n + 1
print('Done')
```

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Quiz: What is the Output?

```python
n = 2
while (n<11):
    n = n + 2
    print(n)
```

Options:
- a) 2
- b) 8
- c) 10
- d) 12
- e) 2
  - 4
  - 6
  - 8
  - 10
Quiz: What is the Output?

n = 1
while (n<10):
    n = n + 2
    print(n)

a)  b)  c)  d)  e)
1   1   3   9   3
2   2   5   5   5
4   4   7   7   7
6   6   9   9   9
8   8   11  

Quiz: What is the Output?

a = 1
b = 1
while (b<20):
    c = a + b
    a = b
    b = c
    print(a)

a)  b)  c)  d)  e)
1   2   3   5   13
2   3   5   8   13
3   5   8   13  

b = 2
a = 1
a = 2
b = 3
b = 3
a = 3
b = 5
b = 5
a = 5
b = 8
b = 8
a = 8
b = 13
b = 13
a = 13
b = 21
b = 21
Quiz: What is the Output?

```python
a = 3
b = 4
while (b<18):
    c = a + b
    a = b
    b = c
print(a)
```

```
11 13 15 17 18
```

Nested `while` Loops

```python
a = 0
while (a<4):
    print(">>>>>>>>>>>a=",a)
    b = 10
    while (b<40):
        print("    a=",a,"    b=",b)
        b = b + 10
        a = a + 1
    print("Done")
```

```
>>>>>>>>>>>a=  0
a= 0 , b= 10
a= 0 , b= 20
a= 0 , b= 30
>>>>>>>>>>>a=  1
a= 1 , b= 10
a= 1 , b= 20
a= 1 , b= 30
>>>>>>>>>>>a=  2
a= 2 , b= 10
a= 2 , b= 20
a= 2 , b= 30
>>>>>>>>>>>a=  3
a= 3 , b= 10
a= 3 , b= 20
a= 3 , b= 30
Done
```