

Isticmaalka for loops si loo maro xogaha (data structures)

Computing

Unit Barnaamijyada Python ee leh taxanaha xogta (sequences of data)



Natiijo

Waxaan isticmaali karaa for loop si aan u eego curiye (element) kasta oo list ah.

Erayada muhiimka ah

iteration (ku celcelin)

habka ku celcelinta taxane tilmaamo ah gudaha loop-ka barnaamijka

for loop

weedh isku celcelin ah oo ku celceli doona dhererka taxane la bixiyay

Isticmaalka for loops si loo maro xogaha (data structures)



Sharax farqiga u dhexeeya while iyo for loops



Isticmaal for loop si aad u eegto shay kasta oo list ku jira

Sharax farqiga u dhexeeya while iyo for loops



Waxaa jira laba nooc oo waaweyn oo iteration (ku celcelin) ah oo loo isticmaalo barnaamijyada:

Condition-controlled iteration: tilmaamaha si isdaba joog ah ayaa loo fuliyaa ilaa shuruud la buuxiyo.

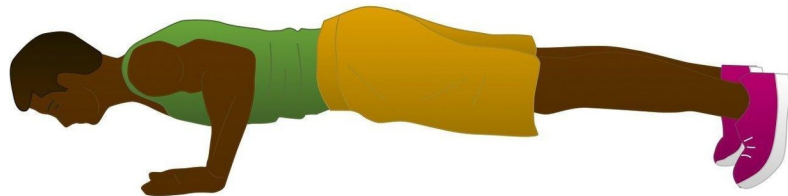
Count-controlled iteration: tilmaamaha si isdaba joog ah ayaa loo fuliyaa tiro go'an.

Sharax farqiga u dhexeeya while iyo for loops

Ka fikir haddii tababare ku weydiisto
inaad sameysid press-ups.

Waa maxay tilmaamaha uu ku siin karo
oo tusaale u noqon kara count-controlled
iteration?

Waa maxay tilmaamaha uu ku siin karo
oo tusaale u noqon kara condition-
controlled iteration?



Sharax farqiga u dhexeeya while iyo for loops

Tusaale u ah soo-noqosho lagu xakameeyo tirinta (count-controlled iteration) waa "Samee 20 riixid (press-ups)."



Saciid

Tusaale u ah soo-noqosho lagu xakameeyo xaalad (condition-controlled iteration) waa "Samee riixid (press-ups) ilaa uu qayliyo (alarm) ka baxo."



Nuur

Loops-ka 'for' waa kuwa lagu xakameeyo tirinta (count-controlled), taasoo la micno ah inaad qeexo tirada jeer ee aad rabto in tilmaamaha lagu celiyo.

Python-ka, shaqada 'range()' waxaa loo isticmaali karaa in lagu qeexo tirada jeer ee 'for loop' uu soo-noqonayo.

```
1 for count in range(1, 6):  
2   print(count)
```



qiime (value) bilowga

qiime (value) joogsiga

Haddii aad bixiso hal dood (argument) oo kaliya, kaas oo noqon doona qiimaha (value) joogsiga, qiimaha (value) bilowga wuxuu noqon doonaa 0 asal ahaan.

```
1 for count in range(6):  
2 print(count)
```



qiime (value) joogsiga



Markii aan code-ga orodiyo, ma muujinayo qiimaha (value) 6. Wuxuu joogsadaa 5.

Saciid

```
1 for count in range(6):  
2 print(count)
```



Soo-saarka qoraalka (Text output)

```
0  
1  
2  
3  
4  
5
```

Qiimaha (value) joogsiga ee shaqada 'range()' waa mid ka reeban (exclusive). Tani waxay la micno tahay in qiimaha (value) ugu dambeeya ee count uu noqon doono ilaa qiimaha (value) joogsiga laakiin aan ku jirin, sidaas darteed 6 lama daabici doono.

Python-ka, while loops waxaa loo isticmaalaa in lagu hirgeliyo ku celcelin (iteration) xaalad-koontarool ah, for loops-na waxaa loo isticmaalaa in lagu hirgeliyo ku celcelin (iteration) tiro-koontarool ah.

```
1 print("Aan samayno koox")
2 band = []
3 new = "yes"
4 while new != "no":
5     print("Dooro qalab muusik")
6     instrument = input()
7     band.append(instrument)
8     print("Dooro mid kale?")
9     new = input()
10    print(band)
```

xaalad-koontarool

Loop-kani wuxuu sii socon doonaa inta isticmaaluhu uusan ka jawaabin 'no'.

```
1 print("Aan samayno koox")
2 band = []
3 for x in range(4):
4     print("Dooro qalab muusik")
5     instrument = input()
6     band.append(instrument)
7     print(band)
```

tiro-koontarool

Loop-kani wuxuu socon doonaa 4 jeer. x wuxuu ka bilaabmaa 0 wuxuuna kordhaa 1 si caadi ah, wuxuuna istaagaa ka hor tiro cayiman, kiiskan, (4).

Python-ka, loops-ka 'while' waxaa loo isticmaalaa in lagu fuliyo soo noqnoqoshada xakamaysan shuruud (condition-controlled iteration), loops-ka 'for' waxaa loo isticmaalaa in lagu fuliyo soo noqnoqoshada xakamaysan tirinta (count-controlled iteration).

Soo saarista qoraalka (Text output)

```
Aynu samayno koox muusik
Dooro qalab
Piano
Mid kale?
haa
Dooro qalab
Durbaano (Drums)
Mid kale dooro?
maya
['Piano', 'Drums']
```

xakamaysan shuruud (condition-controlled)

Soo saarista qoraalka (Text output)

```
Aynu samayno koox muusik
Dooro qalab
Durbaano (Drums)
Dooro qalab
Piano
Dooro qalab
Gitaar (Guitar)
Dooro qalab
Saxophone
['Durbaano (Drums)', 'Piano', 'Gitaar (Guitar)', 'Saxophone']
```

xakamaysan tirinta (count-controlled)

Sharax farqiga u dhexeeya while iyo for loops



Waa maxay tusaalahan koodku?

```
1 for x in "Python":  
2 print(x)
```

a

ku celcelin xakameysan (condition-controlled iteration)

b

ku celcelin tirin (count-controlled iteration)



Maxaad u maleyneysaa in la soo bandhigi doono marka barnaamijkan la shideeyo?

```
1 rolls = [1, 4, 3, 6]
2 for dice in rolls:
3     print(dice)
```

Waxay soo bandhigi doontaa shay
kasta oo ku jira liiska, sida:

1
4
3
6



Nuur

Maxaad u maleyneysaa in la soo bandhigi doono marka barnaamijkan la shideeyo?

```
1 rolls = [1, 4, 3, 6]
2 count = 0
3 for dice in rolls:
4     count = count + 1
5     print(count)
```

Doorshada (variable) count waxaa loo qaabeeyey (initialised) 0 waxaana lagu kordhiyaa (incremented) 1 shay kasta oo liiska ku jira, marka waxay soo bandhigi doontaa:
4



Saciid

Sharax farqiga u dhexeeya loops-ka 'while' iyo 'for'

Maxaa la soo bandhigi doonaa marka barnaamijkan la shideeyo?

a

4

b

3
6

c

2



```
1 rolls = [1, 4, 3, 6]
2 count = 0
3 for dice in rolls:
4     if dice > 3:
5         count = count + 1
6     print(count)
```

Doorshada (variable) count waxaa loo qaabeeyey (initialised) 0 waxaana lagu kordhiyaa (incremented) 1 mar kasta oo shayga liiska ku jira uu ka weyn yahay 3.

- 1) Sharax farqiga u dhexeeya soo noqnoqoshada (iteration) xakamaysan shuruud (condition-controlled) iyo soo noqnoqoshada (iteration) xakamaysan tirinta (count-controlled).
- 2) Barnaamijku wuxuu ka kooban yahay liis midabo ah (colours) waxaadna rabtaa inaad soo bandhigto midab kasta oo liiska ku jira. Sharax nooca loop-ka aad isticmaali lahayd iyo sababta.



1) Sharax farqiga u dhexeeya soo noqnoqoshada (iteration) xakamaysan shuruud (condition-controlled) iyo soo noqnoqoshada (iteration) xakamaysan tirinta (count-controlled).

Soo noqnoqoshada (iteration) xakamaysan shuruud (condition-controlled) waxay soconaysaa ilaa shuruud la buuxiyo (tusaale, ilaa calanka (flag) uusan ahayn True). Soo noqnoqoshada (iteration) xakamaysan tirinta (count-controlled) waxay soconaysaa tiro go'an oo jeer.

2) Barnaamijku wuxuu ka kooban yahay liis midabo ah (colours) waxaadna rabtaa inaad soo bandhigto midab kasta oo liiska ku jira. Sharax nooca loop-ka aad isticmaali lahayd iyo sababta.

Waxaan isticmaali lahaa loop-ka 'for'. Sababtoo ah loop-ka 'for' waxaa loo dhigi karaa inuu socdo tiro la mid ah dhererka tirada shayada liiska ku jira. Barnaamijku wuxuu ku soo noqnoqonayaa (iterate) shay kasta oo liiska ku jira wuxuuna soo bandhigayaa midab (colour) ka mid ah liiska mar kasta oo loop-ka la fuliyo (executed).

Qaabka casharka

Isticmaalka loops-ka 'for' si loo maro qaab-dhismeedka xogta (data structures)



Sharax farqiga u dhexeeya loops-ka 'while' iyo 'for'



Isticmaal loop-ka 'for' si aad u eegto shay kasta oo ku jira liiska

Loop-ka 'for' waxaa loo isticmaali karaa inuu maro liiska oo uu eego shay kasta. Liiskani wuxuu hayaa magacyada caasimadaha.

```
1 cities = ["Amsterdam", "Athens", "Belgrade",  
2 "Berlin", "Bern", "Bratislava",  
3 "Brussels", "Bucharest", "Budapest",  
4 "Copenhagen", "Dublin", "Helsinki",  
5 "Lisbon", "Ljubljana", "London",  
6 "Luxembourg"]  
7 count = 0  
8 for city in cities:  
9     if city[0] == "L":  
10         count = count + 1  
11         print(count)
```

Loop-ka 'for' wuxuu maraa liiska oo wuxuu kordhiyaa doorsoomaha (variable) 'count' mar kasta oo magaalo ku jirta liiska ay ku bilaabanto xarafka "L".

Waa kee code-ka aad ku dari lahayd line-ka 9 si aad u hubiso in magaalo kasta oo ku jirta liiska ay ku bilaabanto "B"?

a

city[1] == "B":

b

city[0] == "B":

c

city[1] == "b":



```
1 cities = ["Amsterdam", "Athens", "Belgrade",  
2 "Berlin", "Bern", "Bratislava",  
3 "Brussels", "Bucharest", "Budapest",  
4 "Copenhagen", "Dublin", "Helsinki",  
5 "Lisbon", "Ljubljana", "London",  
6 "Luxembourg"]  
7 count = 0  
8 for city in cities:  
9     haddii (if)  
10     count = count + 1  
11     daabac (print)
```

Magaalooyinka waxaa lagu kaydiyaa qaabka cinwaanka (title case), marka haddii (if) bayaanku u baahan yahay inuu hubiyo "B" weyn.

Curiye (element) kasta oo gaar ah sidoo kale waa la eegi karaa iyadoo la isticmaalayo hababka xarafka (string methods).

```
1 cities = ["Amsterdam", "Athens", "Belgrade",  
2 "Berlin", "Bern", "Bratislava",  
3 "Brussels", "Bucharest", "Budapest",  
4 "Copenhagen", "Dublin", "Helsinki",  
5 "Lisbon", "Ljubljana", "London",  
6 "Luxembourg"]  
7 count = 0  
8 for city in cities:  
9     if len(city) > 6:  
10         count = count + 1  
11         daabac(count)
```

Loop-ka 'for' wuxuu ku socdaa liiska oo wuxuu kordhiyaa doorsoome 'count' mar kasta oo magaalo ku jirta liiska ay leedahay in ka badan 6 xarfo.

Isticmaal loop 'for' si aad u eegto shay kasta oo ku jira liis



Waa maxay qiimaha (value) 'count' ka dib marka barnaamijkan la fuliyo?

a 2 ✓

b 4

c 0

```
1 cities = ["Amsterdam", "Athens", "Belgrade",  
2 "Berlin", "Bern", "Bratislava",  
3 "Brussels", "Bucharest", "Budapest",  
4 "Copenhagen", "Dublin", "Helsinki",  
5 "Lisbon", "Ljubljana", "London",  
6 "Luxembourg"]  
7 count = 0  
8 for city in cities:  
9     if len(city) > 6 and city[0] == "L":  
10         count = count + 1  
11 daabac(count)
```

Ilaa hadda, waxaad ku celisay liisaska ay ku jiraan xarfaha (strings), laakiin habka wuxuu la mid yahay liis ay ku jiraan tirooyin.

```
1 ages = [12, 11, 13, 15, 12, 14, 13, 11]
2 count = 0
3 for age in ages:
4     if age >= 12:
5         count = count + 1
6         print(count)
```

Loop-ga 'for' wuxuu ku dhex wareegaa liiska (list) wuxuuna kordhiyaa doorsoomaha (variable) 'count' mar kasta oo da'du ka weyn tahay ama la eg tahay 12.

Waa maxay qiimaha (value) 'count' ka dib marka barnaamijka la shubo?

Xarun cimilo oo Heathrow ah ayaa kormeeraysay roobabka (rainfall) mm laga soo bilaabo 1948.

- 1) Fur faylka bilowga ah `oak.link/rainfall`
- 2) Faylku wuxuu soo ruraa xogta roobabka (rainfall data) fayl qoraal ah wuxuuna daabacaa gelitaanka oo dhan. Ka saar qoraalka 'print' ee safka 5. Kadib, wax ka beddel koodhka si aad ugu darto doorsoome (variable) 'count' oo aad u kordhiso doorsoomaha 'count' mar kasta oo roobabku (rainfall) ka weyn yahay 65 mm.
- 3) Muuji tirada jeer ee roobabku (rainfall) ka weyn yahay 65 mm.

Soo-saarka qoraalka (Text output)

Tirada jeer ee roobabku (rainfall) ka weyn yahay 65mm: 214

oak.link/rainfall-solution

```
1 from textfile import load
2 rainfall_data = load("rainfall_data.txt")
3 count = 0
4 for value in rainfall_data:
5     if value > 65:
6         count = count + 1
7
8 print(f"Number of times rainfall exceeds 65mm: {count}")
9
```

4) Fur faylka bilowga ah oak.link/rainfall-insights

5) Faylka bilowga wuxuu ka kooban yahay laba doorsoome (variables):

`max_rainfall = 0` `min_rainfall = 1000`

- a) Ku dar loop-ka 'for' si aad u dhex marto liiska qiyaasaha roobka.
- b) Haddii roobku ka sarreeyo qiimaha (value) hadda ku jira `max_rainfall`, markaas qiyaasta `max_rainfall` waa in lagu beddelaa shayga hadda ku jira liiska.
- c) Haddii roobku ka hooseeyo qiimaha (value) hadda ku jira `min_rainfall`, markaas qiyaasta `min_rainfall` waa in lagu beddelaa shayga hadda ku jira liiska.
- d) Dhamaadka barnaamijka, soo bandhig qiyaasaha `max_rainfall` iyo `min_rainfall`.



oak.link/rainfall-insights-solution

```
1 from textfile import load
2 rainfall_data = load("rainfall_data.txt")
3 max_rainfall = 0
4 min_rainfall = 100
5 for value in rainfall_data:
6     if value > max_rainfall:
7         max_rainfall = value
8     elif value < min_rainfall:
9         min_rainfall = value
10
11 print(f"Maximum rainfall in mm: {max_rainfall}")
12 print(f"Minimum rainfall in mm: {min_rainfall}")
```

Ku celcelinta tirinta (count-controlled iteration) waxaa lagu hirgeliyaa iyadoo la isticmaalayo loops-ka 'for' ee Python.

Shaqada range() waxaa loo isticmaali karaa loop-ka 'for' si loo qeexo tirada jeer ee loop-ku ku celcelinayo.

Loops-ka 'for' waxaa loo isticmaali karaa inay dhex maraan shay kasta oo ku jira liiska si ay u baaritaan shay kasta.