s4

February 7, 2023

0.1 12 Shell-röðun

[2]:
```
def insertsort(A):
  i = 1
  while i < len(A):
    j = i
    while j > 0 and A[j-1] > A[j]:
        A[j-1],A[j] = A[j],A[j-1]
        j -= 1
    i += 1
  return A


def shellsort(a):
  k = 1
  N = len(a)
  while(True):
    bil = N//2**k
    k+= 1
    if bil < 1:
      break
    for i in range(bil):
      b = insertsort(a[i:N:bil])
  return b

print(shellsort([8,3,2]))
print(shellsort([8,5,1,9,6,2,1,7,11,3]))
print(shellsort([67, 92, 18, 44, 67, 71, 77, 58, 29, 40, 11, 13]))
```

```
[2, 3, 8]
[1, 1, 2, 3, 5, 6, 7, 8, 9, 11]
[11, 13, 18, 29, 40, 44, 58, 67, 67, 71, 77, 92]
```

0.2 13.1 Skrá með íslenskum orðum

[18]:
```
from urllib.request import urlopen
f = urlopen("https://cs.hi.is/python/ord.txt")
ordList = []
```

```
for line in f:
   ordList.append(line.decode().strip())

fimmOrd = ""
for i in range(5):
    fimmOrd += ordList[i] + " "

print(fimmOrd)

for k,i in enumerate(ordList, 1):
    if k % 10000 == 0 or len(i) > 30:
        print(f'{k:6}', i)
```

```
abba abbadís abbadísar abbadísarinnar abbadísartíð
  3512 alþjóðaheilbrigðisstofnunarinnar
  3574 alþjóðasiglingamálastofnunarinnar
  5822 atvinnuleysistryggingasjóðurinn
 10000 barónessunni
 20000 bókmenntaheimurinn
 30000 eldvarpa
 39136 flugslysarannsóknarnefndarinnar
 40000 flögrað
 50000 galdrakerlingin
 60000 hafnarverkamannsins
 70000 hnýtta
 80000 illkvittnislega
 90000 konunglegan
100000 leiðbeiningu
110000 margnefndi
120000 nemann
121142 norðuratlantshafssjávarspendýraráðsins
121175 norðurheimskautsrannsóknaráðsins
130000 ramman
140000 sandhólum
150000 skynsemd
160000 stjórnarþátttöku
170000 sólarhofsins
172917 teiknimyndaævintýrapoppálfkonan
180000 tötralegum
190000 veðurratsjá
200000 árásargjörn
210000 útdauðar
```

0.3 13.2

[19]:
```
def palindrome(s):
    return (s==s[::-1])

count = 0

for i in ordList:
    if palindrome(i):
        if count == 10:
            print()
            count = 0
        else:
            print(i, end=", ")
            count +=1
```

```
abba, afa, aga, agga, aka, ala, alla, ama, amma, ana,
argra, assa, ata, axa, aða, gíg, gýg, illi, inni, iðaði,
kajak, kok, kák, kæk, kók, kúk, mm, muninum, munnum, munum,
mussum, natan, nón, píp, rabbar, radar, raddar, rafar, ragar, rakar,
rammar, rappar, rasar, rassar, ratar, raðar, rifir, riðir, ruddur, rullur,
runur, rár, rær, rór, rör, rýr, sinnis, stúts, summus, sás,
tillit, tæt, uku, ullu, undnu, unnu, unu, uxu, á, æ,
ísí, ó, óbó, ódó, óró, ý,
```

0.4 13.3

[38]:
```
def longest(s):
    vowels = ['a', 'á', 'e', 'é', 'i', 'í', 'o', 'ó', 'u', 'ú', 'y', 'ý', 'æ',␣
 ↪'ö']
    longword = []
    longest_word_length = 0
    longest_words = []
    for i in s:
        word = i.lower()
        count = sum(1 for char in word if char in vowels)
        if count == 1:
            longword.append(word)
            word_length = len(word)
            if word_length > longest_word_length:
                longest_word_length = word_length
    for word in longword:
        if len(word) == longest_word_length:
            longest_words.append(word)
    print(longest_words)
longest(ordList)
```

```
['bhmfólks', 'skrappst', 'skyggnst', 'strengst']
```

0.5 15.1 og 15.2 Sameining nafnaskrár og einkunnarskrár

[52]:
```
f = urlopen("https://cs.hi.is/python/einkunn.txt")

for line in f:
    (tala, einkunn) = line.decode().strip().split()
    einkunnir[tala] = einkunn
print(einkunnir)

f = urlopen("https://cs.hi.is/python/nofn.txt")

for line in f:
    (tala,nafn) = line.decode().strip().split(maxsplit=1)
    nofn[tala] = nafn
print(nofn)
```

```
{'0176': '7.0', '0542': '8.0', '0970': '9.5', '1419': '6.5', '1577': '7.0',
'2785': '9.0', '4218': '7.0', '4854': '9.0', '5469': '10.0', '6324': '6.5',
'6558': '8.5', '7923': '5.5', '8003': '9.5', '8148': '5.0', '8492': '7.5',
'9058': '7.5', '9134': '8.0', '9158': '8.0', '9340': '6.5', '9572': '8.0',
'9576': '5.5', '9595': '8.5', '9649': '6.5', '9706': '9.0'}
{'0176': 'Kjartan Valur Jónsson', '0542': 'Aðalheiður Pétursdóttir', '0970':
'Sigrún Ása Jónsdóttir', '1419': 'Erla Ýr Guðnadóttir', '1577': 'Hulda Ósk
Jónasdóttir', '2785': 'Bjarki Már Sveinsson', '4218': 'Kristín Fjóludóttir',
'4854': 'Anton Ingi Þórsson', '5469': 'Íris María Birgisdóttir', '6324': 'Ívar
Sigurðsson', '6558': 'Ágúst Guðni Ingason', '7923': 'Steinunn Guðlaug
Gunnarsdóttir', '8003': 'Eydís Þorsteinsdóttir', '8148': 'Signý Guðrún
Pálsdóttir', '8492': 'Andri Oddur Steinarsson', '9058': 'Elías Ari Heimisson',
'9134': 'Birta Lárusdóttir', '9158': 'Anna Sveinbjörnsdóttir', '9340': 'Bjarni
Rúnar Kjartansson', '9572': 'Arna Þórisdóttir', '9576': 'Mark Johnson', '9595':
'Víðir Kristjánsson', '9649': 'Anna Kristinsdóttir', '9706': 'Jónas
Valdimarsson'}
```

0.6 15.3

[53]:
```
for i in einkunnir:
    print(i,einkunnir[i], nofn[i])
```

```
0176 7.0 Kjartan Valur Jónsson
0542 8.0 Aðalheiður Pétursdóttir
0970 9.5 Sigrún Ása Jónsdóttir
1419 6.5 Erla Ýr Guðnadóttir
1577 7.0 Hulda Ósk Jónasdóttir
2785 9.0 Bjarki Már Sveinsson
4218 7.0 Kristín Fjóludóttir
4854 9.0 Anton Ingi Þórsson
5469 10.0 Íris María Birgisdóttir
6324 6.5 Ívar Sigurðsson
```

```
6558 8.5 Ágúst Guðni Ingason
7923 5.5 Steinunn Guðlaug Gunnarsdóttir
8003 9.5 Eydís Þorsteinsdóttir
8148 5.0 Signý Guðrún Pálsdóttir
8492 7.5 Andri Oddur Steinarsson
9058 7.5 Elías Ari Heimisson
9134 8.0 Birta Lárusdóttir
9158 8.0 Anna Sveinbjörnsdóttir
9340 6.5 Bjarni Rúnar Kjartansson
9572 8.0 Arna Þórisdóttir
9576 5.5 Mark Johnson
9595 8.5 Víðir Kristjánsson
9649 6.5 Anna Kristinsdóttir
9706 9.0 Jónas Valdimarsson
```

0.7 15.4

[86]:
```python
def highest(eink,nafn):
    highestGrade = 0
    highestName = 0
    for i in eink:
        if (float(eink[i]) > highestGrade):
            highestGrade = float(eink[i])
            highestName = i
    print(f'{nafn[highestName]} var með hæstu einkunn: {highestGrade}')

highest(einkunnir,nofn)
```

```
Íris María Birgisdóttir var með hæstu einkunn: 10.0
```