

cap_sage_rscore

```
string = 'WORT'
num = map(lambda x: ord(x) - 64, string)
print num
```

```
[23, 15, 18, 20]
```

```
def digit(string):
    return map(lambda x: ord(x) - 64, string)
```

```
digit('WORT')
```

```
[23, 15, 18, 20]
```

```
def letters(num_list):
    return ''.join(chr(i+64) for i in num_list)
```

```
num = digit('WORT'); print num
letters(num)
```

```
[23, 15, 18, 20]
```

```
'WORT'
```

```
def reed_solomon(wort):
    liste = digit(wort)
    #a,b = var('a,b')
    a1 = (-sum( [ (k+2)*liste[k] for k in range(len(liste)) ]
    ))%31
    a0 = (-sum( [a1]+liste ))%31
    return letters([a0,a1] + liste)
```

```
reed_solomon('WORT')
```

```
'APWORT'
```

```
string = 'APWIRT'
liste = digit(string); liste
```

```
[1, 16, 23, 9, 18, 20]
```

```
e = sum(liste)%31; e
```

```
25
```

```
s = sum( [ k*liste[k] for k in range(len(liste)) ] )%31;s
```

```
13
```

```
x = s*power_mod(e, -1, 31)%31; x
```

```
3
```

```
liste[x] = (liste[x]-e)%31;liste
def reed_solomon_inv(wort):
```

```

liste = digit(wort)
e = sum( liste )%31
if e != 0:
    s = sum( [ k*liste[k] for k in range(len(liste)) ]
)%31
    x = s*power_mod(e,-1,31)%31
    liste[x] = (liste[x] - e)%31
liste = liste[2:]
return letters( liste )

```

```
reed_solomon_inv('APWIRT')
```

```
'WORT'
```

```
code = reed_solomon('MATHEMATIK'); code
```

```
'JMMATHEMATIK'
```

```
code = code[:6]+'S'+code[7:];code
```

```
'JMMATHSMATIK'
```

```
reed_solomon_inv( code )
```

```
'MATHEMATIK'
```

```
code = code[:-1]+'J';code
```

```
'JMMATHSMATIJ'
```

```
reed_solomon_inv( code )
```

```
'MATHSMSTIJ'
```