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In [2]: import pandas as pd
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aca subimos el precio del bono

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In [3]: x = [200,180,160,140,120,100]
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In [ ]: #pedimos que el usuario entre la informacion necesaria para realizar las operaciones
dias = input("cada cuantos dias se pagan los bonos : ")
n = int(input("en que periodos quieres valuar? (ej:periodo 5, escribe 5) : "))
c = input("cuantos dias despues del periodo " + str(n) + " quieres valuar? : ")
i = float(input("cual es la tasa de interes(escribir la efectiva) : "))

if i > 1:
    i = i/100
```

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In [6]: for bono in x:
        if x.index(bono) <= (n-1):
            x[x.index(bono)] = 0

while 0 in x:
    x.remove(0)
```

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In [7]: #quitamos el bono del indice 0 si es que queremos valuar el bono dias mas adelante del periodo
#que se ingreso anteriormente
if int(c) > 0:
    x.pop(0)
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In [8]: dias_a_descontar = int(dias) - int(c)
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In [9]: p = []
for bono in x:
    periodo_a_descontar = int(dias_a_descontar)/int(dias)
    dias_a_descontar += int(dias)

    p.append(periodo_a_descontar)
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In [10]: largo = len(x)
numero = []
r = 1
while r <= largo:
    numero.append(r)
    r += 1
```

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In [11]: m_duration = pd.DataFrame(index = numero )
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In [12]: m_duration["dias a descontar"] = p
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In [13]: m_duration["cupones"] = x
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In [ ]: largo = len(x)
print(largo)
```

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In [33]: #ahora hay que descontar los cupones a valor presente
bonos_descontados = []
k=0
while k < largo:
    for bono in x:
        bono_descontado = float(bono)/(1+i)**(m_duration["dias a descontar"].iloc[k])
        k += 1
        bonos_descontados.append(bono_descontado)
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In [35]: m_duration["cupon descontado a VA"]=bonos_descontados
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In [38]: precio = m_duration["cupon descontado a VA"].sum()
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In [39]: m_duration["weight va/precio"] = m_duration["cupon descontado a VA"]/precio
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In [43]: #chequeamos que la suma de la columna weight va/precio sea igual a 1
chequeo = m_duration["weight va/precio"].sum()
if chequeo != 1:
    print("error!")
```

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In [44]: m_duration["weight (x) dias a descontar"] = m_duration["weight va/precio"]*m_duration["dias a descontar"]
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In [ ]: modified_duration = m_duration["weight (x) dias a descontar"].sum()
print("la modified duration es de " + str(modified_duration))
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In [ ]: macaulay_duration = modified_duration/(1+i)
print("la macaulay duration es de " + str(macaulay_duration))
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