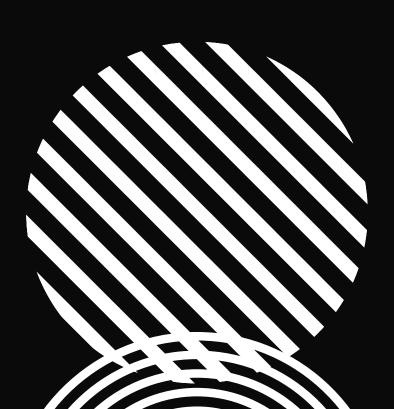


Bank Trust Modelling



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Tirst Order linear differential equation is in form of
                  y'+ P(x) y = Q(x)
 solve for u(2) = e sp(x) = in order to solve P(2) & Q(2)
  => general salution is y(x) = \frac{1}{u(x)} \int Q(x) u(x) dx
Now, Consider a ban't account that earns 8% interest companded continously hus an initial balance of zero. Money is deposited into one account at a constant rute of $1000 per year (about $2.74/2by)
What is one balance in the account often 20 years?
         Jy = (0.08) y x1000
               1y = 1t.
           \frac{1}{\frac{8}{100}} \ln |0.08y| + \omega 00| = t + c = 2 \frac{100}{8} \ln |0.08y| + |0.00| = t + c
          =7 \ln \left[0.0891000\right] = \left(\frac{2}{25}\right) + \left(\frac{2}{25}\right)
                                = 2+ + Cz
              0.08y 11000 = e (2/25+62)
          =7 0.084 = e^{\frac{2}{25}t} + c_2 -1000
          => y= (e = +(2 - 1000) 25
                = 12.50 = 12500
             y(t)= 12-5 e25 + c2 - 12500, now at 4=0 y(0)=0
         : y(0)=0= 125e2-1500
                  => 12500 = 12.5 e(2.
                   >7 12500 = e<sup>C2</sup>
                   = 2 C_2 = ln \left| \frac{12500}{12.5} \right|
```

$$y(t) = 12.5 e^{\frac{2t}{25} + C_2} - 12500$$

$$= 2 y(t) = 12.5 (e^{\frac{2t}{25}} e^{\ln \left(\frac{12500}{125}\right)} - 12500$$

$$= 12.5 \cdot 12500 e^{\frac{2t}{25}} - 12500$$

$$= 12 500 e^{\frac{2t}{25}} - 12500$$

Bossic form:
$$\frac{2y}{8t}$$
 = Ry t O
where $\frac{2}{5}$ = 0.08 $\frac{1}{5}$ tmax = 20
 $\frac{1}{5}$ = 0

$$(x, y(0)) = 0 = 10e^{c_2} - (0000)$$

= loe 10 rcz - 10000

ineur Scaling of one result of the first simulation con't be applied to get correct result for second simulation cose.