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% Name :- Debottam Debnath
% PRN :- 124B1C171
% Batch :- G3
% Practical 8.1
```

```
syms x c
syms a b positive % Positive parameters
```

```
Ig=input("Enter the function/Integrand f(x)", 's');
Ig=str2sym(Ig) % Ig means given I
```

```
Ig =

$$\frac{x^a - 1}{\log(x)}$$

```

```
% Take limits from user
Ia=input("Enter the value of lower limit")
```

```
Ia =
0
```

```
Ib=input("Enter the value of upper limit")
```

```
Ib =
1
```

```
p=input("Differentiation w.r.t. which parameter/variable?");
fprintf("differentiating w.r.t. %s, using DUIS rule",p)
```

```
differentiating w.r.t. a, using DUIS rule
```

```
if isnumeric(Ia) && isnumeric(Ib)
    dI_dp=int(diff(Ig,p),x,Ia,Ib);
    fprintf("df_d%s = %s",p,dI_dp)
    Ic=int(dI_dp,p) + c % Ic means I calculated
    % To calculate c
    q=input(['Enter the appropriate value of ', char(p), ' to evaluate c']);
    fprintf("Put %s=%s, to calculate c",char(p),sym(q))
    disp("Ig=Ic")
    eq=int(subs(Ig,p,q),x,Ia,Ib)==subs(Ic,p,q)
    c1=solve(eq,c)
    disp("Required integral is ")
    I=subs(Ic,c,c1);
    I=simplify(I)
else
```

```
dI_dp=int(diff(Ig,p),x,Ia,Ib)+diff(Ib,p)*subs(Ig,x,Ib)-  
diff(Ia,p)*subs(Ig,x,Ia)  
end
```

```
df_da = 1/(a + 1)  
Ic = c + log(a + 1)  
Put a=0, to calculate c  
Ig=Ic  
eq = 0 = c  
c1 = 0  
Required integral is  
I = log(a + 1)
```