
Euler's Method

Akshay Kumar
204005
Numerical Method (Practical)

Sample Question

In[6] :=

```
ClearAll;
Euler[ao_, bo_, ho_, f_, alpha_] :=
Module[{a = N[ao], b = N[bo], h = N[ho], n, x},
  n =  $\frac{b - a}{h}$ ;
  y[0] = alpha;
  For[i = 0, i ≤ n, i++,
    x[i] = a + h * i;
    y[i + 1] = y[i] + h * f[x[i], y[i]];
    Print["Value at x[" , i, "]=", x[i], " is ", y[i]];
  ];
];
f[x_, y_] := y * x^3 - 1.5 y;
Euler[0, 2, 0.5, f, 1]
```

Value at x[0]=0. is 1

Value at x[1]=0.5 is 0.25

Value at x[2]=1. is 0.078125

Value at x[3]=1.5 is 0.0585938

Value at x[4]=2. is 0.113525

Ques-1.

In[6] :=

```
f[x_, y_] := x^2 + y^2;
Euler[0, 0.3, 0.1, f, 1]
```

Value at x[0]=0. is 1

Value at x[1]=0.1 is 1.1

Value at x[2]=0.2 is 1.222

Value at x[3]=0.3 is 1.37533

Ques-2.

In[]:=

```
f[x_, y_] := 3 x + 2 y;  
Euler[0, 0.3, 0.1, f, 1]
```

Value at x[0]=0. is 1

Value at x[1]=0.1 is 1.2

Value at x[2]=0.2 is 1.47

Value at x[3]=0.3 is 1.824

Ques-3.

In[]:=

```
f[x_, y_] := Log[x + y];  
Euler[1.2, 1.4, 0.2, f, 2]
```

Value at x[0]=1.2 is 2

Value at x[1]=1.4 is 2.23263