** Experiment Name :** Heun’s Method for ordinary differential equations.

**Experiment Objectives :** Heun’s Iterative Rule is a numerical method which we used for solving ordinary differential equations.

**Theory :** The Heun’s iterative method is a modified Euler’s method to generate a numerical solution to an initial value problem of the form,

Where

So the Heun’s iterative method can be written as,

**Program Code :**

% heun's method

**h = input('Enter the step size: ');**

x = 1:h:2;

y = zeros(size(x));

y(1) = 2;

**n = numel(y);**

**for i = 1:n-1**

**m1 = (2\*y(i))/x (i);**

**ye(i+1) = y(i)+(m1\*h);**

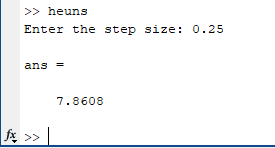
**m2 = (2\*ye(i+1))/(x(i+1));**

y(i+1) = y(i)+(((m1+m2)/2)\*h);

end

y(i+1)

**Output :**



**Discussion :** In this experiment, we have experimented the Heun’s iterative method which is a numerical method for solving ordinary differential equation. The results of the experiment were accurate and there were no errors while doing the experimental calculations. We also came to the conclusions that, the values we got by using Heun’s method are more efficient than the normal method and less efficient than Euler’s method for solving ordinary differential equations.