Mat Lab

Exercise 1: To find a root of an equation of a single variable using Bisection Method.

Algorithm:

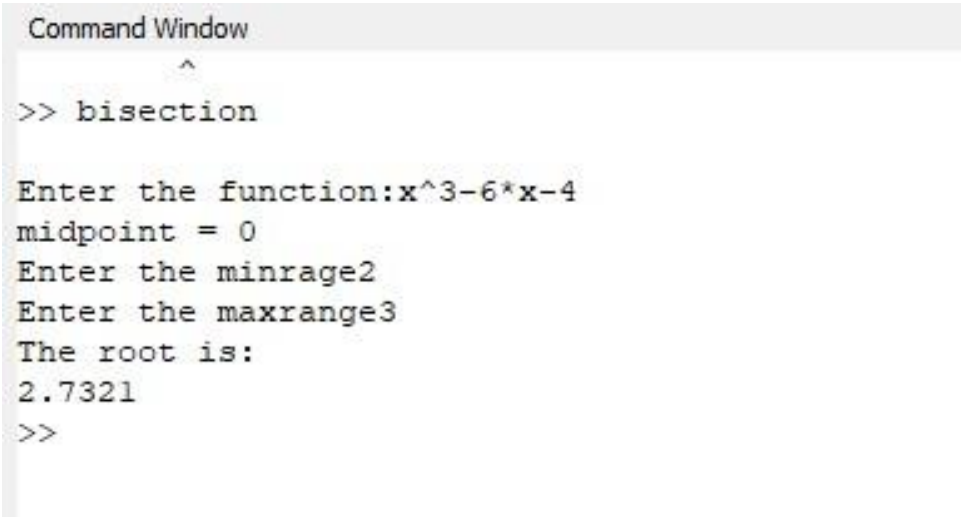
- Start
- Read the function f(x)
- Assign two values (a, b) were the root lies between a and b
- Calculate f(a), f(b) if (f(a)*f(b)<0)
- Then choose anew value c= (a+ b)/2 it is the first approximate root
- If f(c) approximately equals 0 then go to Point no 7 else, if f(a)*f(c)<0 then b=c else, if f(b)*f(c)<0 then a=c.
- New intervals [a, b] automatically updated as per above conditions.
- Continue the process from point no 4.
- Print c as approximate root.
- End

Program:

bisection.m

```
z=input('Enter the function:','x');
f=inline(z);
midpoint=0
a=input("Enter the minrage");
b=input("Enter the maxrange");
if f(a)*f(b)<0
  while(1)midpoint=(a+b)/2;
  if(f(midpoint)<0.000001 && f(midpoint)>-0.000001)
  break;
end
if f(midpoint)*f(b)<0
  a=midpoint;
end
if f(a)*f(midpoint)<0
  b=midpoint;
end
end
disp("The root is: "),disp(num2str(midpoint))
else
disp("The range is not acceptable\n");
end
```

Output:


Command Window
^
>> bisection
Enter the function:x^3-6*x-4
midpoint = 0
Enter the minrage2
Enter the maxrange3
The root is:
2.7321
>>