Bahria University,

Karachi Campus



LAB EXPERIMENT NO.

**3**

LIST OF TASKS

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| --- | --- |
| TASK NO | OBJECTIVE |
| 1 | Write a python program for approximating the roots of following functions using bisection method:  x3- 9x+1 starting with the interval [2, 4]  3x = √ (1 + sinx) starting with the interval [0, 1] |
| 2 | Write a python program for approximating the roots of following functions using false-position method:  f(x) = (x−4)2 (x+2) starting with the interval [-2.5, -1.0]  f(x) = e x (3.2sin(x)−0.5cos(x)) starting with the interval [3,4] |
|  |  |
|  |  |

Submitted On:

**Date: \_\_\_\_\_\_\_\_\_\_\_**

**Task No. 01:**

**Write a python program for approximating the roots of following functions using bisection method:**

1. **x3- 9x+1 starting with the interval [2, 4]**
2. **3x = √ (1 + sinx) starting with the interval [0, 1]**

**Solution and Output:**

|  |  |
| --- | --- |
| **A** | **B** |
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**Task No. 02:**

**Write a python program for approximating the roots of following functions using false-position method:**

1. **f(x) = (x−4)2 (x+2) starting with the interval [-2.5, -1.0]**
2. **f(x) = e x (3.2sin(x)−0.5cos(x)) starting with the interval [3,4]**

**Solution and Output:**

|  |  |
| --- | --- |
| **A** | **B** |
| def function(x):    return (((x-4)\*\*2)\*(x+2))  def bisection\_method(a,b,num\_iteration):    if(function(a)\*function(b)>=0):      print('incorrect intervals')      return    for \_ in range(num\_iteration):      c=a-((function(a)\*(b-a))/(function(b)-function(a)))      if function(c)==0:        print('exact root= ',c)        return      if(function(c)\*function(a)<0):        b=c      else:        a=c    print('approximate root: ',c ) | import math  def function(x):    return (math.exp(x))\*(3.2\*(math.sin(x))-(0.5\*math.cos(x)))  def bisection\_method(a,b,num\_iteration):    if(function(a)\*function(b)>=0):      print('incorrect intervals')      return    for \_ in range(num\_iteration):      c=a-((function(a)\*(b-a))/(function(b)-function(a)))      if function(c)==0:        print('exact root= ',c)        return      if(function(c)\*function(a)<0):        b=c      else:        a=c    print('approximate root: ',c ) |