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NPTEL

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Courses » Computational Hydraulics

Announcements

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Unit 7 - Week 6

Course outline

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Week 6 Assignment

The due date for submitting this assignment has passed. **Due on 2017-09-18, 23:59 IST.**

Submitted assignment

1) In Scilab, use *ludcomp.sci* to solve the following problem

1 point

$$\begin{pmatrix} 10 & 13 & 11 & -9 & 2 \\ 1 & 4 & -7 & 1 & 13 \\ 0 & 3 & -5 & -7 & 9 \\ 1 & 2 & -3 & 4 & 5 \\ 5 & 1 & 3 & -2 & 1 \end{pmatrix} \begin{Bmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \\ \phi_5 \end{Bmatrix} = \begin{Bmatrix} 43 \\ 57 \\ 8 \\ 37 \\ 13 \end{Bmatrix}$$

The value of ϕ_3 term is

- 1
- 2
- 3
- 4
- 5
- NaN or Inf

No, the answer is incorrect.

Score: 0

Accepted Answers:

3

2) In Scilab, use *ludcomp.sci* to solve the following problem

1 point

$$A = \begin{pmatrix} 10 & 2 & 3 & 5 \\ 6 & 12 & 8 & 9 \\ 10 & 11 & 13 & 13 \\ 14 & 15 & 16 & 15 \end{pmatrix} \begin{Bmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \end{Bmatrix} = \begin{Bmatrix} 43 \\ 90 \\ 123 \\ 152 \end{Bmatrix}$$

The value of ϕ_2 term is

- 1
- 2
- 3
- 4
- 5
- NaN or Inf

No, the answer is incorrect.

Score: 0

Accepted Answers:

2

3)

1 point

Week 7

Week 8

Week 9

Week 10

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Week 12

In Scilab, use **jacobi.sci** to solve the following problem

$$\begin{pmatrix} 10 & 13 & 11 & -9 & 2 \\ 5 & 1 & 3 & -2 & 1 \\ 1 & 4 & -7 & 1 & 13 \\ 0 & 3 & -5 & -7 & 9 \\ 1 & 2 & -3 & 4 & 5 \end{pmatrix} \begin{pmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \\ \phi_5 \end{pmatrix} = \begin{pmatrix} 43 \\ 13 \\ 57 \\ 8 \\ 37 \end{pmatrix}$$

Starting from initial value 1, The value of term ϕ_3 is

- 1
 2
 3
 4
 5
 NaN or Inf

No, the answer is incorrect.

Score: 0

Accepted Answers:

NaN or Inf

4) In Scilab, use **gseidel.sci** to solve the following problem

1 point

$$\begin{pmatrix} 10 & 13 & 11 & -9 & 2 \\ 5 & 1 & 3 & -2 & 1 \\ 1 & 4 & -7 & 1 & 13 \\ 0 & 3 & -5 & -7 & 9 \\ 1 & 2 & -3 & 4 & 5 \end{pmatrix} \begin{pmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \\ \phi_5 \end{pmatrix} = \begin{pmatrix} 43 \\ 13 \\ 57 \\ 8 \\ 37 \end{pmatrix}$$

Starting from initial value 1, the value of term ϕ_3 is

- 1
 2
 3
 4
 5
 NaN or Inf

No, the answer is incorrect.

Score: 0

Accepted Answers:

NaN or Inf

5) In Scilab, use **tdma.sci** to solve the following problem

1 point

$$\begin{pmatrix} 1 & 1 & 0 & 0 & 0 & 0 \\ 5 & 1 & 2 & 0 & 0 & 0 \\ 0 & 4 & 1 & 3 & 0 & 0 \\ 0 & 0 & 3 & 1 & 4 & 0 \\ 0 & 0 & 0 & 2 & 1 & 5 \\ 0 & 0 & 0 & 0 & 1 & 1 \end{pmatrix} \begin{pmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \\ \phi_5 \\ \phi_6 \end{pmatrix} = \begin{pmatrix} 11 \\ 43 \\ 33 \\ 23 \\ 13 \\ 3 \end{pmatrix}$$

The value of ϕ_3 is

- 1
 2
 3
 4
 5
 6
 NaN or Inf

No, the answer is incorrect.

Score: 0

Accepted Answers:

NaN or Inf

6) In Scilab, use *tdma.sci* to solve the following problem

1 point

$$\begin{pmatrix} 10 & 1 & 0 & 0 & 0 & 0 \\ 5 & 10 & 2 & 0 & 0 & 0 \\ 0 & 4 & 10 & 3 & 0 & 0 \\ 0 & 0 & 3 & 10 & 4 & 0 \\ 0 & 0 & 0 & 2 & 10 & 5 \\ 0 & 0 & 0 & 0 & 1 & 10 \end{pmatrix} \begin{Bmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \\ \phi_5 \\ \phi_6 \end{Bmatrix} = \begin{Bmatrix} 65 \\ 88 \\ 69 \\ 50 \\ 31 \\ 12 \end{Bmatrix}$$

The value of ϕ_3 term is

- 1
 2
 3
 4
 5
 NaN or Inf

No, the answer is incorrect.**Score: 0****Accepted Answers:**

4

7) In Scilab, use *newton_raphson.sci* to solve the following problem

1 point

$$\begin{pmatrix} \phi_1 & \phi_2 & \phi_3 \\ \phi_1 & \phi_2 & -1 \\ 1 & 1 & 1 \end{pmatrix} \begin{Bmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \end{Bmatrix} = \begin{Bmatrix} 3 \\ 1 \\ 3 \end{Bmatrix}$$

The value of ϕ_3 term is

- 1
 2
 3
 4
 5
 6
 NaN or Inf

No, the answer is incorrect.**Score: 0****Accepted Answers:**

NaN or Inf

8) In Scilab, use *newton_raphson.sci* to solve the following problem

1 point

$$\begin{pmatrix} \phi_1 & \phi_2 \\ \phi_1 & -1 \end{pmatrix} \begin{Bmatrix} \phi_1 \\ \phi_2 \end{Bmatrix} = \begin{Bmatrix} 5 \\ -1 \end{Bmatrix}$$

The absolute value of ϕ_1 term is

- 1
 2
 3
 4
 5
 NaN or Inf

No, the answer is incorrect.**Score: 0****Accepted Answers:**

1

9) In Scilab, use **gseidel.sci** to solve the following problem

1 point

$$\begin{pmatrix} 16 & 3 \\ 7 & -11 \end{pmatrix} \begin{Bmatrix} \phi_1 \\ \phi_2 \end{Bmatrix} = \begin{Bmatrix} 11 \\ 13 \end{Bmatrix}$$

Starting from initial value 0. If the relaxation factor is 0.5, then number of iterations required in Gauss-Seidel-SOR method is

- less than that required for Gauss-Seidel approach
- more than that required for Gauss-Seidel approach
- less than that required for Gauss-Seidel-SOR approach with relaxation factor 0.25
- more than that required for Gauss-Seidel-SOR approach with relaxation factor 0.25

No, the answer is incorrect.

Score: 0

Accepted Answers:

more than that required for Gauss-Seidel approach

less than that required for Gauss-Seidel-SOR approach with relaxation factor 0.25

10) Full matrix approach can not be solved using

1 point

- tridiagonal matrix algorithm
- Gauss-Seidel approach
- Jacobi approach
- LU Decomposition
- None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

tridiagonal matrix algorithm

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