

Assessment subm
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vkgupta1425@gmail.com ☐ (https://onlinecourses.nptel.ac.in/noc23_ph46/#)

NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » **Scientific Computing Using Python**
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Course outline

How does an
NPTEL online
course work?
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Week 1
([https://online
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Week 2
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Thank you for taking the Week 4: Assignment 4.

Week 4: Assignment 4

Your last recorded submission was on 2023-08-19, 06:13 IST Due date: 2023-08-23, 23:59 IST.

- 1) Interpolation is a method of **1 point**
 - ☐ Interrelating
 - ☒ Estimating
 - ☐ Integrating
 - ☐ Combining
- 2) Interpolation is done by **1 point**
 - ☒ Curve fitting
 - ☐ Regression analysis
 - ☐ Curve fitting and Regression analysis
 - ☐ None of the mentioned
- 3) Error is equal to **1 point**
 - ☐ Distance between the data points
 - ☐ Square of the distance between the data points
 - ☐ Half the distance between the data points
 - ☒ None of the mentioned
- 4) Which produces smoother interpolants? **1 point**

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Week 3
(https://onlinecourses.nptel.ac.in/noc23_ph46/)

Week 4
(https://onlinecourses.nptel.ac.in/noc23_ph46/)

● Lecture 27 :
Lagrange interpolation and Splines
(https://onlinecourses.nptel.ac.in/noc23_ph46/unit?unit=53&lesson=54)

● Week 4:
Lecture Notes
(https://onlinecourses.nptel.ac.in/noc23_ph46/unit?unit=53&lesson=72)

● Quiz: Week 4:
Assignment 4
(https://onlinecourses.nptel.ac.in/noc23_ph46/assessment?name=65)

○ Feedback for
Week 4
(https://onlinecourses.nptel.ac.in/noc23_ph46/unit?unit=53&lesson=71)

Week 5
(https://onlinecourses.nptel.ac.in/noc23_ph46/)

- Polynomial interpolation
○ Spline interpolation
● Polynomial and Spline interpolation
○ None of the mentioned

5) What is the degree of polynomial for n data point in lagrange interpolation.

1 point

- $n - 1$
○ n^2
○ n
○ n^3

6) What is the error formula for the lagrangian interpolation of function $f(x)$ with n data points, where ζ is the intermediate point? 1 point

- $E_n = f(x) - P_n(x) = \frac{f^{(n)}(\zeta)}{n!} \Pi(x - x_i)$
○ $E_n = f(x) - P_n(x) = \frac{f^{(n-2)}(\zeta)}{n!} \Pi(x - x_i)$
○ $E_n = f(x) - P_n(x) = \frac{f^{(n^2)}(\zeta)}{n!} \Pi(x - x_i)$
○ $E_n = f(x) - P_n(x) = \frac{f(\zeta)}{n!} \Pi(x - x_i)$

7) The Lagrange polynomial that passes through the 3 data points is given by $f(15) = 24$, $f(18) = 37$, and $f(22) = 25$. $f_2(x) = L_0(x)(24) + L_1(x)(37) + L_2(x)(25)$. The value of $L_1(x)$ at $x = 16$ is 1 point

- -0.071430
● 0.50000
○ 0.57143
○ 4.3333

8) In cubic spline interpolation,

1 point

- the first derivatives of the splines are continuous at the interior data points
● the second derivatives of the splines are continuous at the interior data points
○ derivatives of the splines are continuous at the interior data points
○ the third derivatives of the splines are continuous at the interior data points

9) Find $f(3)$ by using Lagrange's formula $f(0)=2$, $f(1)=3$, $f(2)=12$, $f(5)=147$

1 point

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- ☐ 25
☐ 27
☐ 30
☒ 32

10) Find the polynomial for the following data.

1 point

- $x = 4, f(x) = 1$
- $x = 6, f(x) = 3$
- $x = 8, f(x) = 8$
- $x = 10, f(x) = 16$

- ☒ $(3x^2 - 22x + 368)/8$
☐ $3x^2 - 22x + 36$
☐ $(3x^2 - 19x + 368)/2$
☐ $(3x^2 - 19x + 368)/8$

You may submit any number of times before the due date. The final submission will be considered for grading.

Submit Answers