

Assignment 2

Unit 4

1. Define a structure and explain how structure is defined, declared and initialized with an example program.
2. Explain about array of structures with an example program.
3. Explain the different ways to initialize a structure with example program.
4. Define pointer. Explain how to access variables using pointer with an example program.
5. Explain about pointer expressions with an example program.

Unit 5

1. When does the Simpson's method give exact result?
2. Find the roots of the equation $f(x): x^3 - 4x + 1 = 0$ using Bisection method and Newton Raphson method.
3. Find the value of y for $x = 0.2$ when $\frac{dy}{dx} = \log(x + y)$ with initial condition that $y=1$, when $x = 0$ by using Euler's and Runge Kutta method.
4. Compute the integral $\int_0^{\frac{\pi}{2}} \sqrt{\sin x} dx$ by applying trapezoidal method and Simpson's 1/3 rule for $n=6$.
5. Find the first and tenth value of the given series using Newton's interpolation methods.

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|-----|-----|-----|------|------|------|------|------|
| x | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| y | 4.8 | 8.4 | 14.5 | 23.6 | 36.2 | 52.8 | 73.9 |

6. Find the polynomial equation $f(x)$ using Lagrange's interpolation for the given tabular values:

| | | | | |
|--------|---|---|----|-----|
| x | 0 | 1 | 2 | 5 |
| $f(x)$ | 2 | 3 | 12 | 147 |