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2CS10

10201605 5

QUESTION 1

Estimate the value of f(2.25) using the Newton's divided difference interpolation. Compare with the exact value.

```
n = 4;
x = input("Enter x values");
y = input("Enter y values");
x0 = input("Input the interpolating point");
f =zeros(1,n);
for i = 1:n
  f(i,1) = y(i);
end
for i = 2:n
  for j = 2:i
    f(i,j)=(f(i,j-1)-f(i-1,j-1))/(x(i)-x(i-j+1));
  end
end
res = f(n,n);
for i = n-1:-1:1
  res = res*(x0-x(i)) + f(i,i);
end
res
```

INPUT/OUTPUT

```
>> Q1
Enter x values[ 1, 1.5, 2, 2.5 ]
Enter y values[2.7183, 4.4817, 7.3891, 12.1825]
Input the interpolating point2.25

res =

    9.5037
```

QUESTION 2

```
n = 4;
x = input("Enter x values");
y = input("Enter y values");
x0 = input("Input the interpolating point");
f =zeros(1,n);
for i = 1:n
   f(i,1) = y(i);
end
for i = 2:n
   for j = 2:i
      f(i,j)=(f(i,j-1)-f(i-1,j-1))/(x(i)-x(i-j+1));
   end
end
res = f(n,n);
for i = n-1:-1:1
   res = res*(x0-x(i)) + f(i,i);
end
res
```

INPUT/OUTPUT

```
>> Q2
Enter x values[ 0, 0.25, 0.5, 0.75 ]
Enter y values[ 1 , 1.64872 , 2.71828, 4.4816 ]
Input the interpolating point0.43

res =

    2.3606
```