

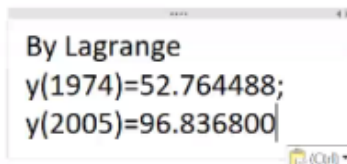
## MAT2001 Lab

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**Example4** Following table gives the census population of a state for the years 1971 to 2011. Estimate the population for the years 1974 and 2005 by using appropriate interpolation technique.

| Year                 | 1971 | 1981 | 1991 | 2001 | 2011 |
|----------------------|------|------|------|------|------|
| Population (Million) | 46   | 66   | 81   | 93   | 101  |

Newton forward  
 $y(1974)=52.7645$   
Newton backward  
 $y(2005)=96.837$ .



```
By Lagrange  
y(1974)=52.764488;  
y(2005)=96.836800
```

| X  | y   |
|----|-----|
| 40 | 31  |
| 50 | 73  |
| 60 | 124 |
| 70 | 159 |

## MATLAB CODE:

```
clc;  
clear all;  
close all;  
x=[1971 1981 1991 2001 2011]  
y=[46 66 81 93 101]  
n=length(x)  
X=2005;  
Y=0;  
for i=1:n  
    L(i)=1  
    for j=1:n  
        L(i)=L(i)*(X-x(j))/(x(i)-x(j));  
    end  
end  
  
end  
Y=Y+L(i)*y(i)
```