

```

> #Final Project Draft
> with(LinearAlgebra) :
> A1:=<<Null,Agriculture,Manufacturing,Services,`Government and
Other`,Household>Total>|<Agriculture,34.69,5.28,10.45,7.92,26.22,
84.5600>|<Manufacturing,4.92,61.82,25.95,12.45,58.29,
163.430>|<Services,5.62,22.99,42.03,42.53,105.86,
219.030>|<`Government and Other`,6.27,15.32,16.17,38.99,30.91,
107.660>|<Household,32.97,44.70,114.48,33.09,2.12,
227.360>|<Total,84.4700,150.110,209.080,134.980,223.400,
802.040>>^+

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```

A1 := [[Null, Agriculture, Manufacturing, Services, Government and Other, Household, Total], (1)
[Agriculture, 34.69, 5.28, 10.45, 7.92, 26.22, 84.5600],
[Manufacturing, 4.92, 61.82, 25.95, 12.45, 58.29, 163.430],
[Services, 5.62, 22.99, 42.03, 42.53, 105.86, 219.030],
[Government and Other, 6.27, 15.32, 16.17, 38.99, 30.91, 107.660],
[Household, 32.97, 44.70, 114.48, 33.09, 2.12, 227.360],
[Total, 84.4700, 150.110, 209.080, 134.980, 223.400, 802.040]]

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> A2:=<<Null,Agriculture,Manufacturing,Services,`Government and
Other`,Household>Total>|<Agriculture,34.69,5.28,10.45,7.92,26.22,
84.5600>|<Manufacturing,4.92,61.82,25.95,12.45,64.12,
169.260>|<Services,5.62,22.99,42.03,42.53,116.45,
229.620>|<`Government and Other`,6.27,15.32,16.17,38.99,30.91,
107.660>|<Household,32.97,44.70,114.48,33.09,2.12,
227.360>|<Total,84.4700,150.110,209.080,134.980,239.820,
818.460>>^+

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A2 := [[Null, Agriculture, Manufacturing, Services, Government and Other, Household, Total], (2)
[Agriculture, 34.69, 5.28, 10.45, 7.92, 26.22, 84.5600],
[Manufacturing, 4.92, 61.82, 25.95, 12.45, 64.12, 169.260],
[Services, 5.62, 22.99, 42.03, 42.53, 116.45, 229.620],
[Government and Other, 6.27, 15.32, 16.17, 38.99, 30.91, 107.660],
[Household, 32.97, 44.70, 114.48, 33.09, 2.12, 227.360],
[Total, 84.4700, 150.110, 209.080, 134.980, 239.820, 818.460]]

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> A3:=<<3469/8447,492/8447,562/8447,627/8447,3297/8447>|(1/15011)*
<528,6182,2299,1532,4470>|(1/20908)*<1045,2595,4203,1617,11448>|
(1/13498)*<792,1245,4253,3899,3309>|(1/23982)*<2622,6412,11645,
3091,212>>

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(3)

$$A3 := \begin{bmatrix} \frac{3469}{8447} & \frac{528}{15011} & \frac{1045}{20908} & \frac{396}{6749} & \frac{437}{3997} \\ \frac{492}{8447} & \frac{6182}{15011} & \frac{2595}{20908} & \frac{1245}{13498} & \frac{458}{1713} \\ \frac{562}{8447} & \frac{2299}{15011} & \frac{4203}{20908} & \frac{4253}{13498} & \frac{11645}{23982} \\ \frac{627}{8447} & \frac{1532}{15011} & \frac{1617}{20908} & \frac{3899}{13498} & \frac{3091}{23982} \\ \frac{3297}{8447} & \frac{4470}{15011} & \frac{2862}{5227} & \frac{3309}{13498} & \frac{106}{11991} \end{bmatrix} \quad (3)$$

> ReducedRowEchelonForm(A3);

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix} \quad (4)$$

> A4:=A3-IdentityMatrix(5);

$$A4 := \begin{bmatrix} -\frac{4978}{8447} & \frac{528}{15011} & \frac{1045}{20908} & \frac{396}{6749} & \frac{437}{3997} \\ \frac{492}{8447} & -\frac{8829}{15011} & \frac{2595}{20908} & \frac{1245}{13498} & \frac{458}{1713} \\ \frac{562}{8447} & \frac{2299}{15011} & -\frac{16705}{20908} & \frac{4253}{13498} & \frac{11645}{23982} \\ \frac{627}{8447} & \frac{1532}{15011} & \frac{1617}{20908} & -\frac{9599}{13498} & \frac{3091}{23982} \\ \frac{3297}{8447} & \frac{4470}{15011} & \frac{2862}{5227} & \frac{3309}{13498} & -\frac{11885}{11991} \end{bmatrix} \quad (5)$$

> N:=NullSpace(A4);

$$N := \left\{ \begin{bmatrix} \frac{16875969510185467447}{47615226304432208940} \\ \frac{36100951951338623473}{47615226304432208940} \\ \frac{2267462866834400650}{2380761315221610447} \\ \frac{10252078599554359273}{2380761315221610447} \\ 1 \end{bmatrix} \right\} \quad (6)$$

> N1:=Vector([[1687596951018546744.7/4761522630443220894.0],

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[3610095195133862347.3/4761522630443220894.0],
[226746286683440065.0/238076131522161044.7],
[10252078599554359273/2380761315221610447.0], [1.0/1.0]]);
```

$$NI := \begin{bmatrix} 0.3544238014 \\ 0.7581808332 \\ 0.9524108329 \\ 4.306218576 \\ 1.000000000 \end{bmatrix} \quad (7)$$

```
> P:=[16875969510185467447/47615226304432208940]+
[36100951951338623473/47615226304432208940]+
[2267462866834400650/2380761315221610447]+
[10252078599554359273/23807613152216104470]+[1];
```

$$P := \begin{bmatrix} 9246975683430723967 \\ 2645290350246233830 \end{bmatrix} \quad (8)$$

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> P1:=924697568343072396.7/264529035024623383.0;
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$$P1 := 3.495637325 \quad (9)$$

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> PT:=81846/100;
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$$PT := \frac{40923}{50} \quad (10)$$

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> PH:=PT/P1;
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$$PH := 234.1375617 \quad (11)$$

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> PH*N1;
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$$\begin{bmatrix} 82.9839246682410 \\ 177.518611613122 \\ 222.995150151872 \\ 1008.24751753189 \\ 234.137561700000 \end{bmatrix} \quad (12)$$

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> Vector ([p[Ag]], [p[Ma]], [p[Se]], [p[Go]], [p[Ho]])=PH*N1;
```

$$\begin{bmatrix} p_{Ag} \\ p_{Ma} \\ p_{Se} \\ p_{Go} \\ p_{Ho} \end{bmatrix} = \begin{bmatrix} 82.9839246682410 \\ 177.518611613122 \\ 222.995150151872 \\ 1008.24751753189 \\ 234.137561700000 \end{bmatrix} \quad (13)$$