A Bayesian Analysis of Excess Deaths in the United States

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Introduction:

COVID-19 has had profound effects on the United States, with millions of confirmed cases and more than 1130000 deaths attributed to the virus. The examination of excess fatalities becomes a crucial tool in the never-ending quest to understand the full scope of the COVID-19 pandemic, providing a broader picture of the true magnitude of mortality. This comprehensive dataset navigates through weekly estimates of excess deaths, spanning various regions of the United States, thereby offering a wider perspective on the toll exacted by the pandemic. Beyond the confines of direct COVID-19 attributions, excess deaths are discerned as the discord between observed and expected mortality within specified temporal boundaries. The dataset not only covers deaths directly tied to COVID-19 but also sheds light on deaths from all causes, helping to uncover potential undercounting and understanding the complexities of mortality during these unprecedented times. To calculate extra deaths, the dataset uses strong Farrington surveillance algorithms, carefully considering variations in expected counts. While the estimates presented are provisional and adjusted for incomplete data, they are a valuable resource for understanding the many aspects of mortality during the ongoing pandemic.

This study takes on a big task—applying Bayesian statistics to estimate all-cause excess mortality in the United States over three years. Using a multiple regression framework, we aim to unravel the factors contributing to extra deaths, with the number of deaths as the focus. Using data from 2020 to 2021, our statistical approach seeks to find patterns, relationships, and nuances that shape mortality dynamics. Recognizing the complexity of modeling each state separately, we take a practical approach by grouping states into regions. This not only makes our analysis more scalable but also captures overall trends beyond state-specific differences. After making predictions for 2022 using the trained model, we critically evaluate the results to identify regions or states that closely match actual mortality patterns. This comparison gives us insights into the effectiveness of our predictions and reveals geographical differences in extra mortality during this specific time frame. As we delve into this analysis, the study contributes not only to the growing field of Bayesian statistics but also adds valuable knowledge to understanding how mortality is changing amid the ongoing challenges of the pandemic.

Preparation of Data:

The original CDC Dataset is a single excel spreadsheet from years 2020 to 2022. It compromises the total weighted and unweighted demographics of excess deaths from all causes and all causes excluding COVID-19, across each State and the District of Columbia. This dataset was first grouped by Year, its Type (Weighted/Unweighted), and then Outcome(All Causes/Excluding COVID-19), resulting in 9 distinct datasets each assigned a sheet in excel.

From here, the sheets were imported into R for further manipulation. States were filtered into 1 of 5 regions and four variables were retained: Week Ending Date, Observed Number of Excess Deaths, Upper Bound Threshold, and the Average Expected Count. The years 2020 and 2021 were grouped together as the training set to predict the observed number of excess deaths in 2022.

A weighted dataset of the excess mortality is used for the analysis. The assignment of different weights accounts for the varying contributions of different states. Additionally, the utilization of a weighted dataset in the analysis is crucial as it allows for a more accurate representation of the population and mitigates the impact of potential biases.

Variables

Week Ending Date:

The date marks the end of the respective week.

Used to organize and categorize the data by week for a more granular analysis.

State

The specific jurisdiction or state for which the data is reported.

Used to categorize and analyze excess deaths on a state-by-state basis.

Region:

The 51 states are separated into 5 different regions.

Used to categorize and analyze excess deaths based on these regions.

Observed Number:

The actual count of deaths observed during a specific week in a particular state.

Provides real-time data on mortality, forming the basis for comparison with expected counts.

Upper Bound Threshold:

The higher limit for expected deaths.

Used as thresholds to determine excess deaths.

The difference between observed deaths and either of these thresholds helps identify the extent of excess mortality.

Average Expected Count:

The average expected number of deaths.

Used as a baseline for comparison with observed mortality.

Exploratory Analysis:

Summary Statistics

Regions	Mean Of Observed Number	Range Of Observed Number	Variance Of Observed Number
Mid West	14502.3	7963	3544449
North East	10059.2	9810	3692144
South East	20382.41	9090	5652608
South West	7919.144	4910	1543290
West	11357.71	7893	2759974

Response Variable

Regions	Mean Of Average Expected Count	Range Of Average Expected Count	Variance Of Average Expected Count
Mid West	12711.36	1733	318444
North East	8881.298	1406	204925
South East	17373.8	2354	576890.8
South West	6446.106	942	90344.17
West	9768.788	1478	232570.8

Predictor Variable

Correlation

Within the correlation plots of each region, we run into our first issue with the dataset. While each of our independent variables has some degree of positive correlation with the dependent variable. The correlation among the independent variables across each Region is effectively perfect. As shown on the correlation plots, the Upper Bound Threshold and Average Expected Count has correlation value of 1. There is no reason to include both variables within our model. We have chosen to retain the Average Expected Count and drop the Upper Bound Threshold from our model.

Histograms

The histograms across the 5 Regions shows a consistent right skew for the Observed Number of Excess Deaths. Within linear regression, transformations are normally applied to variables that have skewed distributions. In this case, applying a natural logarithm to each variable does not eliminate or reduce its skewness. Our goal is to make a parsimonious model, therefore applying transformations that do not help normalize a distribution is counterintuitive.

The Average Expected Count of Excess Deaths shows a relatively flat distribution with noticeable spikes in tails across the Regions. The flatness in the distributions is expected since this data is weighted to account for missing data, as well as being a mean calculated value.

Plots

Average Expected Count and Observed count are plotted for each Region. These plots depict an atypical spread of the data, but some similarities with adjacent regions. The Southwest and Southeast show an almost "Butterfly" pattern in the plot. This indicates an underestimate of excess death at both and high value. The Midwest and West Regions depict underestimates at the mid-to-large number estimates of excess deaths while the Northeast Region's underestimates are in the center. Best of fit lines are superimposed on the plots that foreshadow large errors to come with our model.

Intricacies

The dataset initially included information on mortality for all causes, along with additional data excluding mortality. Upon comparing the datasets and calculating summary statistics, we observed a noteworthy finding. Excluding COVID-19 from the dataset, in essence, was nearly equivalent to including it. This might seem counterintuitive, but it stems from the fact that the dataset focused on excess deaths during the pandemic.

In cases where COVID-19 was excluded, the cause of death might be attributed to specific conditions like a heart attack. However, closer inspection revealed that the underlying cause of these deaths often traced back to the influence of the COVID virus. In other words, although the declared cause might be a heart attack, the root cause was linked to COVID-19. Consequently, there was little distinction between including and excluding COVID-19 in our analysis.

To streamline our focus and avoid redundancy, we chose to proceed with the dataset encompassing all causes. This decision allows for a more comprehensive analysis without duplicating efforts and enhances the clarity of our exploration into excess mortality during the pandemic.

Methodology

We employed the JAGS (Just Another Gibbs Sampler) framework to model our pre-processed dataset. Simple linear regression was utilized for subsequent analysis. Given a high correlation between two predictors, a deliberate choice was made to include only one predictor in the modeling process. The dataset was then stratified into a training set, comprising data from the years 2020 and 2021, and a distinct test set,

representing the year 2022. A region-specific approach was adopted, conducting Bayesian simple linear regression separately for each region. Priors for the regression model were chosen to adhere to a flat distribution, reflecting unknown prior assumptions. The model underwent 5000 iterations to ensure convergence and stability. The efficacy of the trained model was evaluated on the test dataset, specifically aiming to predict the observed number of death rates for the year 2022. This comprehensive methodology aims to provide transparency in our analytical process and forms the basis for subsequent interpretation and analysis of the model's predictions.

Fitting a Bayesian Model

The Model

Using only one independent variable, our model is: $Observed_i \sim Normal(\beta_1 + \beta_2(AEC)_i, \sigma^2)$, for each i = Region. Uninformative priors were used for each model: $\beta_1, \beta_2 \sim Normal(0, 100^2)$ and $\sigma^2 \sim InvGamma$ (0.01,0.01). The reasoning behind using uninformative priors is that we're only using two years' worth of data, that is heavily affected by the COVID-19, to create our model.

Convergence

Four Monte Carlo Markov Chains were run for each of the 5 models with 10,000 post burn-in samples before 15,000 iterations to establish convergence. Each parameter, β_1 , β_2 , converged within these iterations for each chain. Interestingly, each density plot for each Region shows that '0' is very close to the center of the distribution for their β_1 parameter, indicating that the model may not require a y-intercept.

Predictions

Summaries of each of the models shows consistency among the Region's β_1 , β_2 parameters. Each Region's model was used to predict the 2022 Observed Excess Deaths. Among the 5 models, the West Region's Model has the lowest Mean Square Error while the Southeast Region has the highest. Due to the variance in our data being very high, our error statistics are high as well. Normalizing the data would be a recommendation when replicating the analysis.

Regions	MSE	RMSE	MAE
MidWest	2906498	1704.845	1497.989
North West	1311369	1145.15	996.8603
South East	5036022	2244.108	2035.432
South West	1150399	1072.566	990.4863
West	1129958	1062.995	892.321

Conclusion

This study began by analyzing a comprehensive dataset from 52 states via the CDC, offering a detailed view of COVID-19's impact on mortality. Through thorough data cleaning and preprocessing, we focused on three key columns and conducted regional analysis to better understand mortality patterns. Facing challenges like high correlation between predictor variables during multiple linear regression, we chose a singular variable and divided the dataset into training and test sets for Bayesian simple regression using JAGS across regions. Despite grappling with issues like variable correlation and skewed distributions, we aimed for a balanced model reflecting the nuanced dynamics of excess mortality.

After the analysis, our predictive model, though not meeting all expectations, highlighted regional disparities. The West region performed comparatively well, with lower errors, while the Southeast posed complexities in mortality prediction. This discrepancy emphasizes the intricacies in excess mortality estimation, urging ongoing refinement. This study contributes to Bayesian statistics but underscores the need for continuous improvement. Moving forward, exploring additional variables and refining models is crucial for enhanced predictive accuracy. The evolving pandemic demands adaptability, with methodologies honed to match the dynamic landscape of excess mortality.

By forecasting regions with higher expected mortality rates due to COVID-19, the model facilitates resource allocation, aiding healthcare authorities in distributing medical resources, prioritizing vaccination campaigns, and optimizing hospital capacities. Policymakers can utilize the predictions to inform region-specific interventions, adjusting policies such as lockdowns and travel restrictions. The model also assists in awareness and adherence to preventive measures. Furthermore, its adaptability allows for continuous monitoring and updates, ensuring that responses remain dynamic and aligned with the evolving nature of the pandemic.

This study, with its relative successes and challenges, provides valuable insights into excess mortality estimation. As the pandemic unfolds, it emphasizes the ongoing necessity for refining methodologies and models to truly understand COVID-19's impact on mortality across diverse U.S. regions.

Limitations

The study, while offering valuable insights into excess mortality prediction, has certain limitations that requires consideration. Firstly, reliance on the CDC dataset introduces potential data inaccuracies and biases that influences the robustness of the conclusions. Additionally, the pandemic dataset was replacing the missing values using Frimighams Algorithm. The effectiveness of this algorithm is questionable in replacing the missing values, as most of the dataset is unknown of its accuracy.

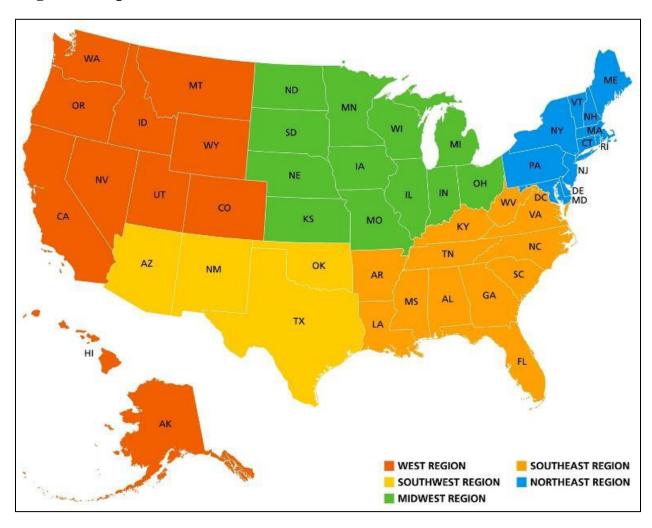
The chosen Bayesian simple regression model using JAGS, while insightful, may not fully capture the complexity of excess mortality dynamics, as evidenced by challenges like variable correlation and skewed distributions. Regional analysis, although providing an overall perspective, may oversimplify the diverse factors within each region that could impact mortality predictions. The study's focus on three key columns might overlook other pertinent variables influencing mortality, limiting the model's explanatory power.

Thus, cautious interpretation and further validation are essential when extrapolating the findings to broader contexts or timeframes.

Recommendations

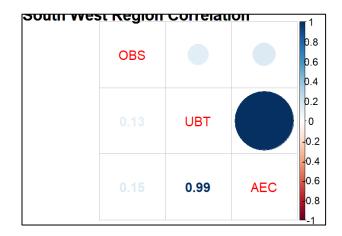
The Bayesian simple regression model using JAGS may benefit from refinement or alternative modeling approaches to better capture the complexities of excess mortality dynamics. Exploring advanced statistical techniques or machine learning methods could address challenges like variable correlation and skewed distributions more effectively. To perform advanced modeling a comprehensive validation and enhancement of the CDC dataset is recommended to address potential redundancies and biases. Verification through additional sources and scrutiny of the Framingham Algorithm for replacing missing values is essential to ensure the dataset's accuracy to perform further analysis. The focus on only two columns may be limiting, and incorporating additional relevant variables could provide a more understanding of the factors contributing to excess mortality. Furthermore, using more data across many years can help in developing and more informative priors to make a better model. A broader scope in terms of variables influencing mortality needs to be considered to enhance the model's explanatory power.

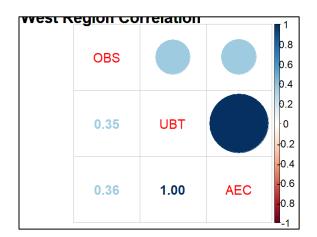
Regional Map

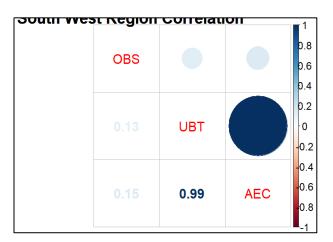


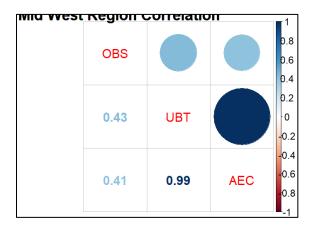
Correlation Matrices

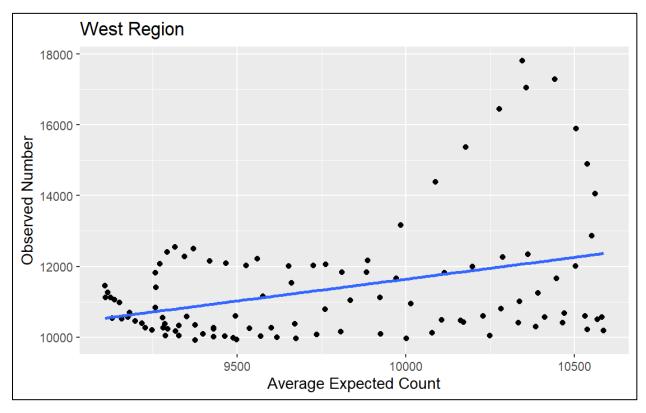
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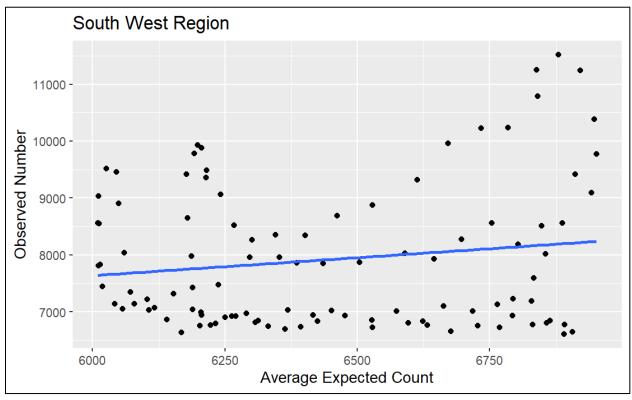


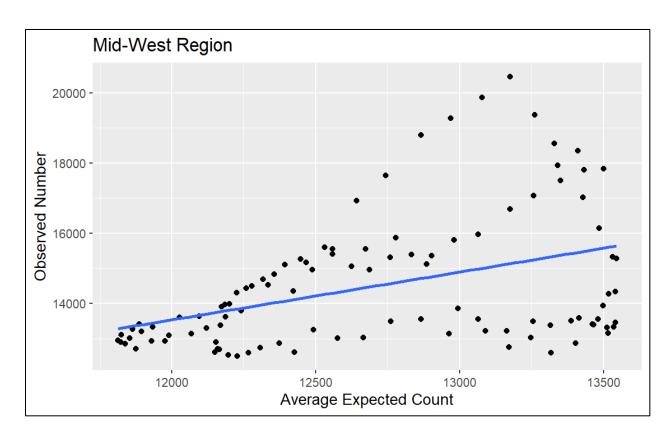


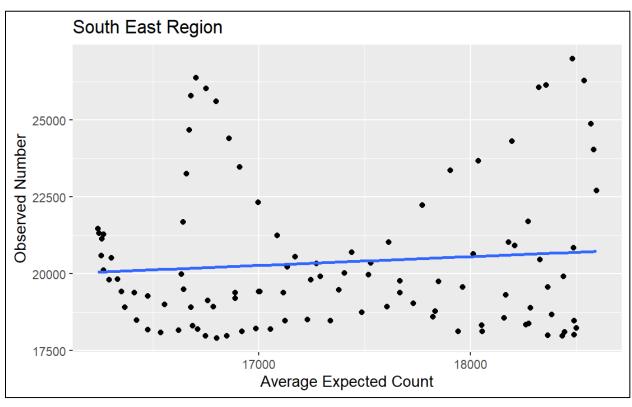


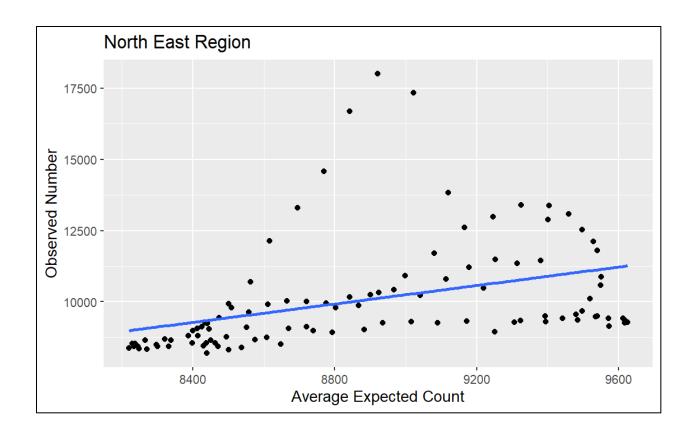


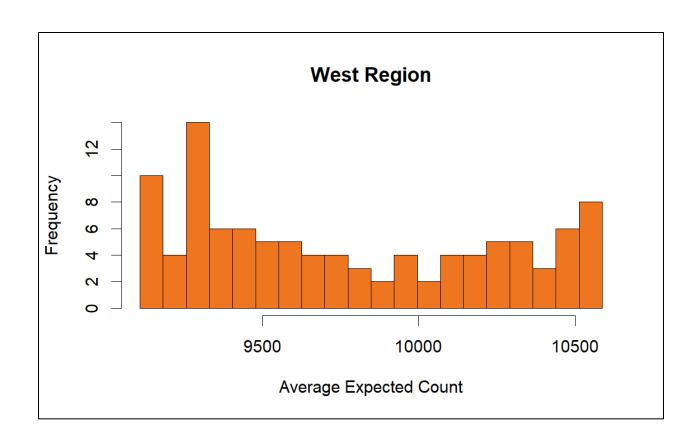


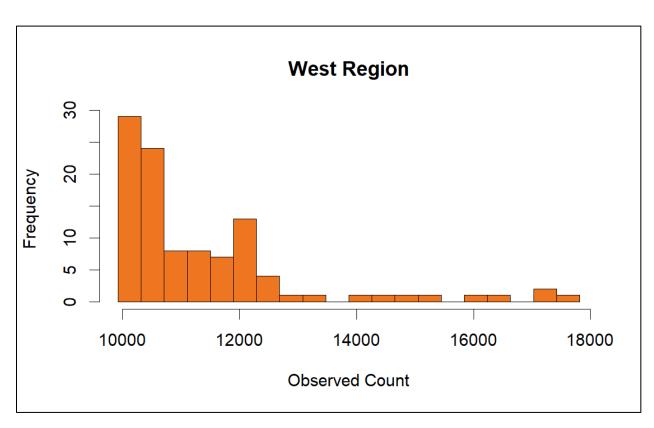


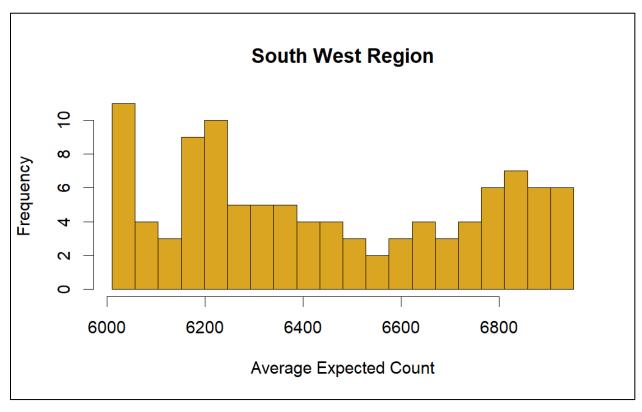


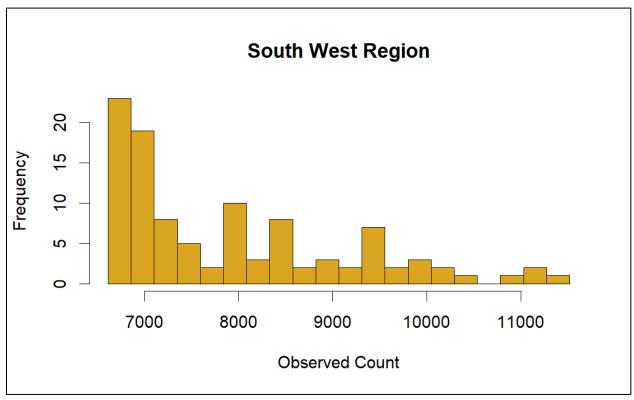


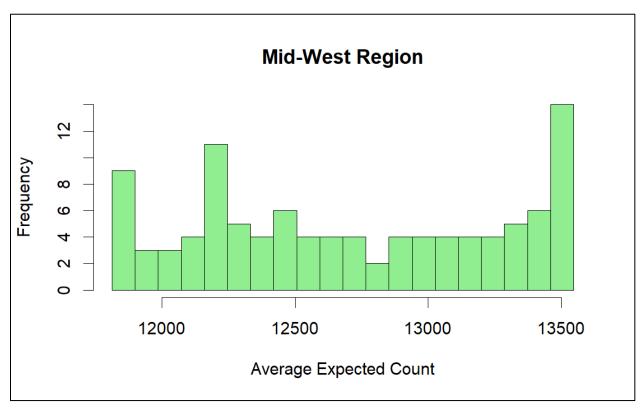


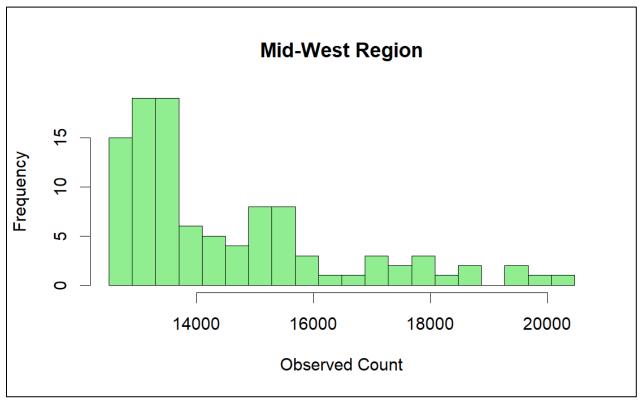


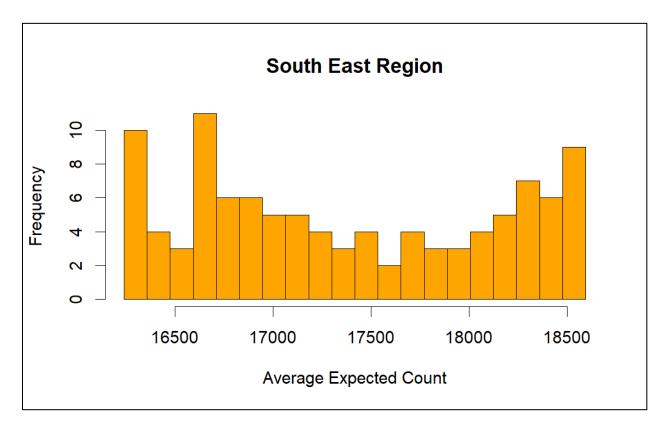


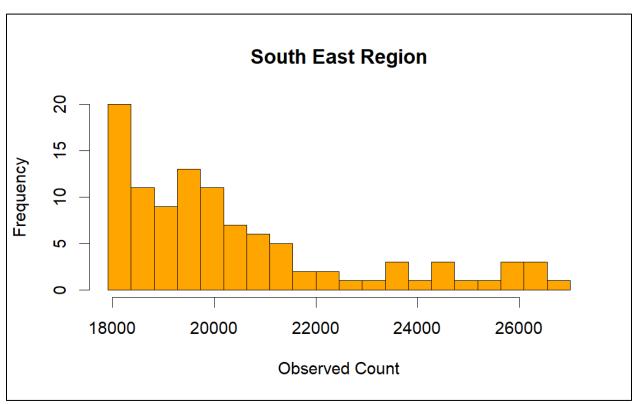


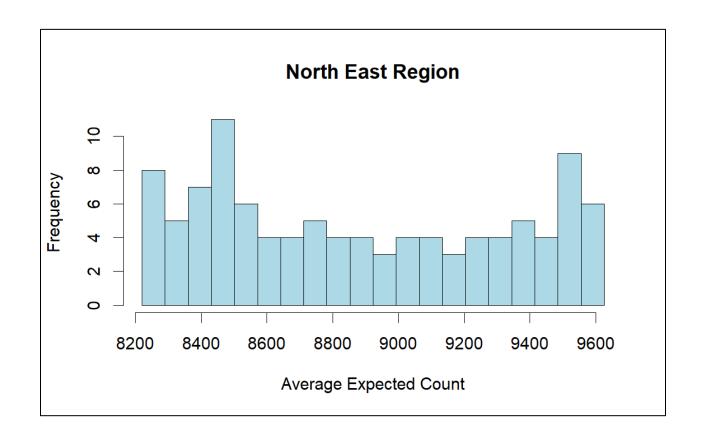


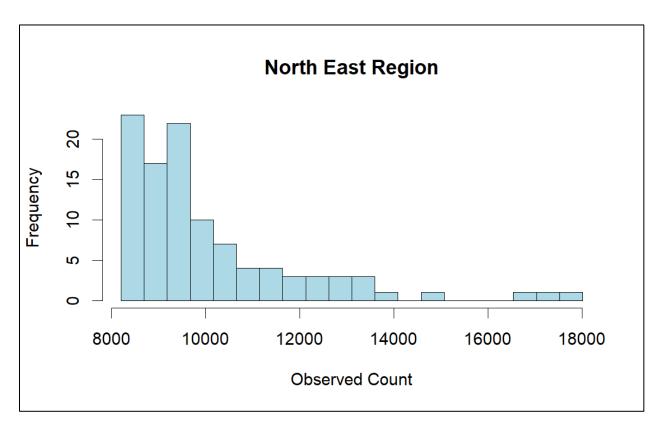


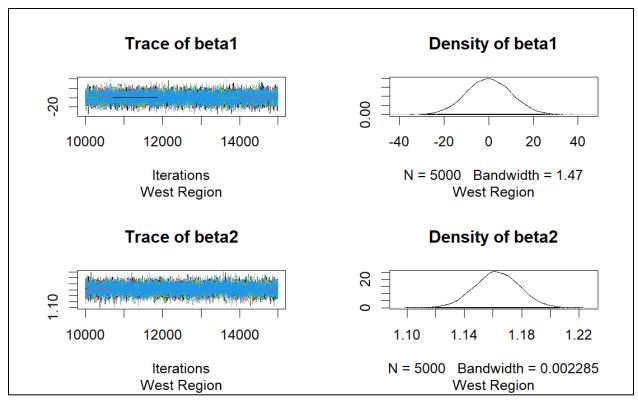


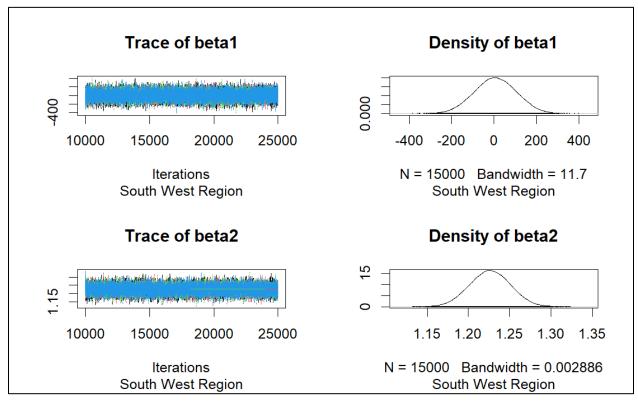


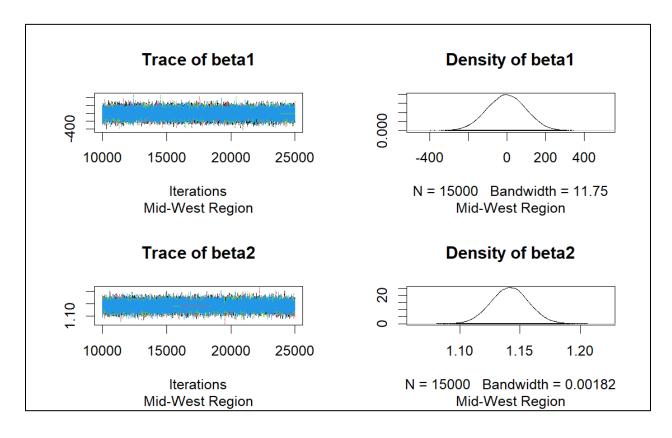


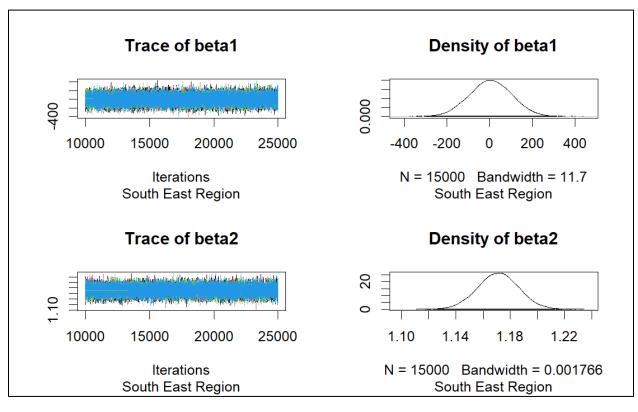


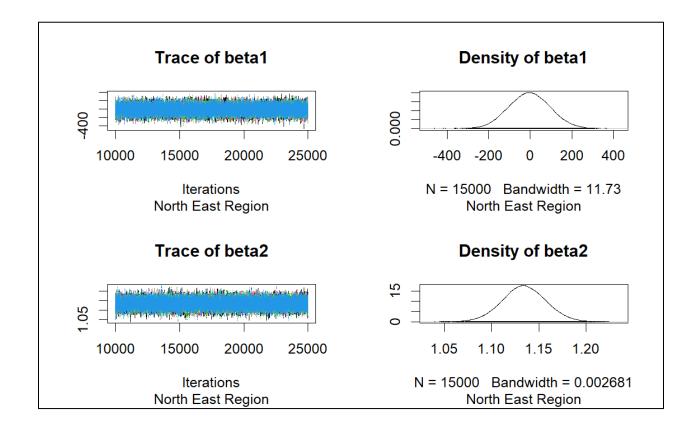












West Region Model Summary

1. Empirical mean and standard deviation for each variable, plus standard error of the mean:

```
MeanSD Naive SE Time-series SEbeta1 0.0207 10.05422 0.07109410.0722562beta2 1.1627 0.01562 0.00011050.0001107
```

2. Quantiles for each variable:

```
2.5% 25% 50% 75% 97.5%
beta1 -19.800 -6.760 -0.03946 6.819 19.653
beta2 1.132 1.152 1.16269 1.173 1.193
```

Mid-West Region Model Summary

1. Empirical mean and standard deviation for each variable, plus standard error of the mean:

```
Mean SD Naive SE Time-series SE
beta1 6.143 99.63472 0.4067570 0.6234379
beta2 1.226 0.02459 0.0001004 0.0001539
```

2. Quantiles for each variable:

```
2.5% 25% 50% 75% 97.5%
beta1 -189.062 -60.92 6.158 73.927 200.447
beta2 1.178 1.21 1.226 1.243 1.274
```

Southwest Region Model Summary

1. Empirical mean and standard deviation for each variable, plus standard error of the mean:

```
Mean SD Naive SE Time-series SE
beta1 -2.229 100.06834 0.4085273 5.315e-01
beta2 1.142 0.01551 0.0000633 8.218e-05
```

2. Quantiles for each variable:

```
2.5% 25% 50% 75% 97.5% beta1 -199.126 -70.099 -1.944 65.530 192.113 beta2 1.111 1.131 1.142 1.152 1.172
```

Southeast Region Model Summary

1. Empirical mean and standard deviation for each variable, plus standard error of the mean:

```
MeanSD Naive SE Time-series SEbeta1 4.596 99.61631 4.067e-014.666e-01beta2 1.171 0.01515 6.183e-057.149e-05
```

2. Quantiles for each variable:

```
2.5% 25% 50% 75% 97.5% beta1 -190.541 -61.458 4.762 72.340 199.199 beta2 1.141 1.161 1.171 1.181 1.201
```

Northeast Region Model Summary

1. Empirical mean and standard deviation for each variable, plus standard error of the mean:

```
Mean SD Naive SE Time-series SE
beta1 -4.151 99.90494 4.079e-01 0.5262079
beta2 1.134 0.02295 9.368e-05 0.0001201
```

2. Quantiles for each variable:

```
2.5% 25% 50% 75% 97.5% beta1 -197.879 -71.597 -4.536 63.18 193.43 beta2 1.089 1.119 1.134 1.15 1.18
```

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14585 12442.45 18432 15711.33 10803 8657.556 26992 22115.52 12655 108 14265 12477.33 17284 15721.6 10336 8672.269 26073 22127.23 11938 108 13701 12492.45 16532 15705.62 864 8666.139 24692 22108.5 11171 1171 108 13701 12462.21 15342 15674.8 8843 8624.451 22995 22096.78 10204 108 11539 12366.87 13915 15615.02 7976 8575.406 20513 21969.13 9516 108 11539 12366.87 13915 15615.02 7976 8575.406 20513 21969.13 9516 108 10395 12305.24 13558 15541.25 7433 8548.431 19586 21874.27 9337 107 10650 12237.81 13426 15424.82 7442 8512.874 19067 21786.44 8946 106 10019 12104.09 12877 15138.54 6913 8407.428 18458 21536.99 8922 104 10366 11912.24 12799 14953.4 6653 8343.67 18160 21398.8 8902 104 10366 11912.24 12799 14953.4 6653 829.908 18076 21254.76 8822 103 10315 11604.81 12661 14832.41 6651 8186.727 17758 271134.13 8583 102 10203 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 100 10168 11516.91 12910 14527.64 6809 7997.905 17768 20717.21 9294 997 10322 14455.88 12590 14454.55 6740 7962.348 18161 25658.8 8902 94 10366 11392.23 12565 14154.38 7029 7832.91 117731 20419.75 8865 986 11347.37 12561 1416.79 16481 1327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 97 10393 11715.75 12514 14228.57 6848 7860.58 18492 20320.03 8681 972 10322 14145.98 12590 14445.45 6740 7962.348 18492 20320.03 8681 972 10322 14145.98 12561 1416.71 6750 7804.179 18457 20060.22 8687 961 10568 1134.37 12798 14073.34 6763 7784.561 18052 20312.01 8880 197 10539 11271.57 12614 14228.57 6848 7860.58 18492 20320.03 8681 972 10328 1143.43 12263 14368.8 7029 7833.606 18210 20144.54 8779 965 10368 11034.37 12798 14073.34 6763 7784.561 18052 200727.3 9078.3 10098 11327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 197 10539 11271.57 12614 14228.57 6848 7860.58 18492 20320.03 8681 972 10368 11034.37 12798 14073.34 6763 7784.561 18052 200727.3 9078.2 8669 96 10368 11034.37 12798 14073.34 6763 7784.561 18052 200727.3 90789.8 971 1975 10868 11048.3 10366 10434.53 6808 7774.5325 18220 19978.24 8646 959 10368 110448 1046.68 6808 7796.679 18851 19978.			19851	15617.73					13488	10804.18
14265 12477.33			19018	15675.95					13702	10833.66
13701 12492.45 16532 15705.62 9864 8666.139 24692 22108.5 11171 108 11470 12462.21 15342 15674.8 8843 8624.451 22995 22096.78 10204 103181 12483.96 14550 15655.4 887 8599.98 21146 22033.54 9539 108 11539 12366.87 13915 15612.02 7976 8575.406 20513 21969.13 9516 108 10985 12305.24 13558 15541.25 7433 8548.431 19586 21874.27 9337 10650 12237.81 13426 15424.82 7442 8512.874 19067 21786.44 8946 106 10409 12171.53 12810 15296.98 7127 8476.091 18386 21664.64 8938 106 10019 1204.09 12827 15188.54 6913 8407.428 18458 21536.99 8922 103 10330 12009.91 12722 15058.42 6835 8343.67 18160 13198.8 8902 104 10333 1178.01 12621 14832.41 6651 8186.727 17758 21134.13 8583 102033 1176.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 100 10168 11516.91 12910 14527.64 6809 7997.905 17768 20717.21 9294 97 10322 11445.98 12590 14445.45 66740 7962.348 18161 20563.8 8902 99 10539 11271.57 12614 14228.57 6848 7860.58 18492 20230.03 8681 97 10539 11271.57 12614 14228.57 6848 7860.58 18492 20230.03 8681 97 10580 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 97 10580 11072.74 12662 14048.8 7026 7745.325 18220 19978.94 8711 975 10581 11097.75 12881 14060.78 7706.879 18418 19833.66 8760 95 10568 11004.65 12864 4016.26 7206 7715.898 18394 1978.26 8749 99 99 10562 11041.35 12956 14048.8 7026 7715.898 18394 1978.26 8749 99 90 10502 10072.74 12662 14044.8 7026 7745.325 18220 19978.24 8646 99 10502 10072.74 12662 14044.8 7026 7705.060 18418 1998.33 875 900			18432	15711.33					12655	10854.08
12470 12462.21 15342 15674.8 8843 8624.451 22995 22096.78 10204 108 11836 12438.96 14550 15655.4 8087 8599.928 21146 22033.54 9539 108 11539 12305.24 13558 15541.25 7433 8548.431 19586 21874.27 9337 107 10650 12237.81 13426 15424.82 7442 8512.874 19067 21786.44 8946 106 10409 212171.53 12810 15296.98 7127 8476.091 18386 21664.64 8938 106 10019 12104.09 12827 15188.54 6913 8407.428 18458 21536.99 8922 105 10330 12009.91 12772 15058.42 6835 8343.67 18160 21398.8 8902 104 10366 1912.24 12799 14953.4 6853 8259.068 18076 21254.76 8822 10331 1782.01 12621 14832.41 6651 8186.727 17758 21134.13 8583 102033 11782.01 12613 14636.66 6868 8048.176 17803 20860.09 8938 100 10168 11576.21 12915 14624.66 6868 8048.176 17803 20860.09 8938 100 10168 11576.21 12915 14624.66 6668 8048.176 17803 20860.09 8938 100 10488 11375.05 12518 13467.83 6679 7932.921 17731 20419.75 8865 986 10381 1327.38 12749 14283.36 6618 7885.102 18054 20330.03 8681 973 10321 11247.57 12614 4228.57 6848 7860.58 18202 20210.03 8681 973 10560 11072.74 12662 14044.8 7026 7745.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10564 11040.66 11040.8 12751 14068.77 6768 7706.09 18311 1978.18 13666 14034.53 6897 7717.125 18743 1979.06 8760 955 10564 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10566 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10566 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10566 10041.35 12831 14068.77 6768 7706.09 18511 19786.18 8750 965 10041 10972.75 13056 14034.53 6807 7717.125 18743 19			17284	15721.6					11938	10858.62
11836 12438.96			16532	15705.62						10858.62
11539 12366.87 13915 15612.02 7976 8575.406 20513 21969.13 9516 108 10985 12305.24 13558 15541.25 7433 8548.431 19586 21874.27 9337 107 10650 12237.81 13426 15424.82 7442 8512.874 19967 21786.44 8946 106 10409 12171.53 12810 15296.98 7127 8476.091 18386 21664.64 8938 106 10300 12000.991 12772 15058.42 6835 8434.67 18160 21398.69 8922 105 10303 10209.91 12772 15058.42 6835 8434.67 18160 21398.8 8902 104 10366 11912.24 12799 14953.4 6853 8259.068 18076 21254.76 8822 103 10315 11694.81 12635 14731.96 6651 8186.727 17758 21134.13 8583 102 131576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 10023 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 1038 11357.38 12590 14445.45 6740 7962.348 18161 20563 88902 99 10481 13375.05 12518 14367.83 6549 7932.921 17731 20419.75 8865 986 10381 11327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 97 10332 11445.98 12590 14415.45 6740 7962.348 18161 20563 8868 972 10348 1122.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 9			15342	15674.8					10204	10849.54
10985 12305.24 13558 15541.25 7433 8548.431 19586 21874.27 9337 107										10822.32
10650 12237.81 13426 15424.82 7442 8512.874 19067 21786.44 8946 106 10019 12171.53 12810 15296.98 7127 8476.091 18386 21664.64 8938 106 10019 12104.09 12827 15188.54 6813 8407.428 18458 21536.99 8922 105 10330 12009.91 12722 15058.42 6835 8343.67 18160 21398.8 8902 104 10366 11912.24 12799 14953.4 6651 8186.727 17758 21134.13 8583 102 10315 11694.81 12651 14832.41 6651 8186.727 17758 21134.13 8583 102 10315 11694.81 12635 14731.96 6703 8132.778 17898 21008.82 8855 101 10203 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 100 10168 11516.91 12910 14527.64 6809 7997.905 17768 20717.21 9294 997 10322 11445.98 12590 14445.45 6740 7962.348 18161 20563.8 8902 999 104981 11375.05 12518 14367.83 6618 7885.102 18054 20131.01 8880 97 10539 11271.57 12614 14228.57 6848 7860.58 18492 20230.03 8681 972 10348 1122.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 11343.37 12798 14073.34 6763 7784.561 18055 20027.43 8646 959 10680 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10680 11072.75 13056 14013.55 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10586 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 955 10568 1000.65 12864 14016.26 7206 7706.089 18511 19786.18 8750 956 10682 10998.33 12874 14145.25 6833 7740.421 18425 19977.53 8739 966 100418 10972.75 12986 14068.77 6768 7706.089 18511 19786.18 8750 956 10086 10998.33 12874 14145.25 6833 7740.421 18425 19977.53 8739 966 100862 10998.33 12874 14145.25 6833 7740.421 18425 19977.53 8739 969 10086 10998.33 12874 14145.25 6833 7740.421 18425 19977.53 8739 969 10086 10988.3			13915	15612.02					9516	10804.18
10409 12171.53 12810 15296.98 7127 8476.091 18386 21664.64 8938 106 10019 12104.09 12877 15188.54 6913 8407.428 18458 21536.99 8922 105 10330 12009.91 12722 15058.42 6853 8343.67 18160 21398.8 8902 104 10366 11912.24 12799 14953.4 6853 8259.068 18076 21254.76 8822 103 10203 11782.01 12621 14832.41 6651 8186.727 17758 21134.13 8583 102 10315 11694.81 12635 14731.96 6703 8132.778 17898 21008.82 8855 101 10203 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 100 10168 11516.91 12910 14527.64 6809 7997.905 17768 20717.21 9294 997 10322 11445.98 12590 14445.45 6740 7962.348 18161 20563.8 8902 99 10498 11375.05 12518 14367.83 6618 7885.102 18054 20312.01 8880 97 10348 11222.73 12614 14228.57 6848 7860.58 18492 20230.03 8681 972 10348 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10546 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 960 10568 11007.74 12662 14044.8 7026 7745.325 18220 19978.89 8711 957 10853 11029.72 12882 14013.98 7374 7733.064 18818 19886.9 8918 955 10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 95 10811 10972.75 13056 14034.53 6807 7717.125 18733 1999.06 8766 95 10811 10972.75 13056 14034.53 6807 7717.125 18733 1998.64 1999 1075.07 12986 14081.33 6807 7717.125 18355 19833.03 8562 960 10862 10998.33 12874 14145.25 6833 7740.421 18425 19875.53 8739 96 10027 10966.93 12851 14060.78 7706.612 18365 19833.03 8562 960 10862 10998.33 12874 1445.25 6833 7740.421 18425 19875.53 8739 96 10027 10157 11169.25 13317 14448.88 6819 7849.			13558	15541.25					9337	10757.68
10019 12104.09 12827 15188.54 6913 8407.428 18458 21536.99 8922 105 10330 12009.91 12722 15058.42 6835 8343.67 18160 21398.8 8902 104 10366 11912.24 12799 14953.4 6853 8259.068 18076 21254.76 8822 103 11576.21 12621 14832.41 6651 8186.727 17758 21134.13 8583 102 10315 11694.81 12635 14731.96 6703 8132.778 17898 21008.82 8855 101 10168 11516.91 12910 14527.64 6689 7997.905 17768 20717.21 9294 997 10322 11445.98 12590 14445.45 66740 7962.348 18161 20563.8 8902 99 10322 11445.98 12590 14445.45 6618 7885.102 18054 20312.01 8880 97 10322 11445.98 12794 14283.36 6618 7885.102 18054 20312.01 8880 97 10331 11327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 97 10348 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 960 10586 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.062 18218 1998.266 8766 955 10811 10972.75 13056 14034.53 6897 7717.125 18743 1979.06 8760 955 10586 10943.68 12815 14060.78 7066.93 12851 14068.77 6768 7706.09 18511 19786.18 8750 956 10481 10972.74 12966 14081.33 6801 7712.22 18527 19808.43 8791 957 10277 10975.07 12986 14081.33 6801 7712.22 18527 18908.43 8791 957 10408 10978.56 12984 14104.16 6863 7730.612 18365 1983.03 8562 960 10481 10972.74 12998 14286.79 6927 7778.43 18494 20044.55 8924 97 10172.74 12998 14286.79 6927 7778.43 18494 20044.55 8924 97 10172.74 12998 14286.79 6927 7778.43 18494 20044.55 8924 97 10172.74 12998 14286.79 6927 7778.43 18494 20044.55 8924 97 10298 11123.99 13164 14358.7 6668			13426	15424.82	7442	8512.874			8946	10697.57
10330 12009.91 12722 15058.42 6835 8343.67 18160 21398.8 8902 104 10366 11912.24 12799 14953.4 6853 8259.068 18076 21254.76 8822 103 10233 11782.01 12621 14832.41 6651 8186.727 17758 21134.13 8583 10203 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 100 10168 11516.91 12910 14527.64 6809 7997.905 1768 20717.21 9294 997 10322 11445.98 12590 14445.45 6740 7962.348 18161 20563.8 8902 99 10498 11375.05 12518 14367.83 6549 7932.921 17731 20419.75 8865 986 10381 11327.38 12749 14228.57 6848 7860.58 18492 20230.03 8681 972 10381 11327.38 12749 14228.57 6848 7860.58 18492 20230.03 8681 972 10348 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 90129 906 10562 11041.35 12837 14028.82 7267 7745.325 18220 19978.24 8666 959 10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 95 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10578 10975.07 12986 14068.77 6768 7771.125 18743 19799.06 8760 95 10586 10993.68 12815 14060.78 7706.089 18511 19786.18 8799 96 1048 10978.56 12984 14104.16 6863 7730.612 18453 1988.03 8799 96 1048 10978.56 12984 14104.16 6863 7730.612 18453 19988.43 8791 956 10408 10978.56 12984 14104.16 6863 7730.612 18453 19988.43 8791 956 10418 1043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 688 10043.53 13694 14358.7 6668 7812.762 18374 20094.18 9109 977 10175 11169.25 13317 14448.88 6819 7849.545 18852 20055.44 9494.04 19075.5 19036 19095.5 19386 102073 11269.24 13795			12810	15296.98					8938	10610.24
10366 11912.24 12799 14953.4 6853 8259.068 18076 21254.76 8822 103			12827	15188.54					8922	10500.23
10233 11782.01 12621 14832.41 6651 8186.727 17758 21134.13 8583 102 10315 11694.81 12635 14731.96 6703 8132.778 17898 21008.82 8855 101 10203 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 101 10168 11516.91 12910 14627.64 6880 7997.905 17768 20717.21 9924 997 10322 11445.98 12590 14445.45 6740 7962.348 18161 20563.8 8902 99 10498 11375.05 12518 14367.83 6549 7932.921 17731 20419.75 8865 986 10381 11327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 97 10539 11271.57 12614 14228.57 6848 7860.58 1892 20230.03 8681 972 10348 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 961 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10853 11029.72 12882 14013.98 7374 7733.064 18818 19886.9 8918 955 10568 11000.65 12864 14016.26 7206 7730.612 18418 1982.366 8766 955 10811 10972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14066.78 7206 7715.898 13839 19782.67 8744 95 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10048 10978.56 12984 14104.16 6863 7730.612 18365 1933.03 8562 960 10862 10998.33 12874 14145.25 6833 7740.421 18403 19946.62 8809 968 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10404 1132.03 13505 1444			12722	15058.42					8902	10401.55
10315 11694.81 12635 14731.96 6703 8132.778 17898 21008.82 8855 101 10203 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 100 10168 11516.91 12910 14527.64 6809 7997.905 17768 20717.21 9294 997 10322 11445.98 12590 14445.45 6740 7962.348 18161 20563.8 8902 99 10381 11375.05 12518 14367.83 6549 7932.921 17731 20419.75 8865 986 10381 11327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 97 10381 11227.57 12614 14228.57 6848 7860.58 18492 2030.03 8681 972 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 960 10562 11041.35 12837 14028.82 7267 7749.004 18221 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10568 11009.72 12882 14013.98 7374 7733.064 18818 19886.9 8918 955 10568 10000.65 12864 14016.26 7206 7730.612 18418 19823.66 8760 955 10568 10943.68 12815 14066.77 6768 7706.089 18511 19786.18 8750 956 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10008.69 12984 14104.16 6821 7771.074 18403 19946.62 8809 968 10008 12984 14145.25 6833 7740.421 18425 18977.53 8329 968 10008 1123.9 13164 1435.87 6686 7812.762 18345 18090.07 18711 2009.67 9545 992 10073 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10073 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10073 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10073 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10073 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10073 11208.78 13450 145			12799	14953.4					8822	10307.42
10203 11576.21 12915 14624.66 6685 8048.176 17803 20860.09 8928 100 10168 11516.91 12910 14527.64 6809 7997.905 17768 20717.21 9294 997 10322 11445.98 12590 14445.45 6740 7962.348 18161 20563.8 8900 99 99 103 10498 11375.05 12518 14367.83 6618 7885.102 18054 20312.01 8880 97 10539 11271.57 12614 14228.57 6848 7860.58 18492 20230.03 8681 972 10539 11271.57 12614 14228.57 6848 7860.58 18492 20230.03 8681 972 10584 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10586 11097.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14066.78 7206 7715.898 18394 19786.18 8750 956 10042 10978.56 12984 14014.16 6863 77712.22 18527 1988.43 8791 956 10082 10998.33 12874 14145.25 6833 7740.421 18425 19877.53 8739 96 10082 10098.78 12922 14217.16 6821 7771.074 18403 19946.62 8809 988 10098 11123.9 13164 14358.7 6687 8712.762 18314 1009.65 13320.3 13505 14746.8 6807 7796.676 18375 19833.03 12874 14448.88 6819 7849.545 18852 20205.44 9422 985 10072 11208.78 13468.03 7946.408 18819 20417.41 9319 988 10072 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 988 10072 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 988 10072 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 988 10072 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 988 10056 11332.03 13505 14746.8 6807 7996.679 18901 20795.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 112			12621	14832.41					8583	10201.94
10168 11516.91 12910 14527.64 6809 7997.905 17768 20717.21 9294 997 10322 11445.98 12590 14445.45 66740 7962.348 18161 20563.8 8902 99 10498 11375.05 12518 14367.83 66549 7932.921 17731 20419.75 8865 986 986 986 986 11327.35 12549 14283.36 6618 7885.102 18054 20312.01 8809 97 97 97 98 1120.00 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18200 19927.89 8711 957 10568 11009.65 12864 14016.26 7206 7730.612 18418 19823.66 8760 955 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12851 14068.77 6683 7706.089 18511 1978.043 8791 956 1048 10978.56 12984 14104.16 6663 7730.612 18457 18980.43 8791 956 10682 10998.33 12874 14145.25 6833 7740.421 18453 19876.62 8809 968 10072 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10172 11208.78 13350 14549.32 6621 7771.074 18403 19946.62 8809 968 10098.33 12874 14145.25 6833 7740.421 18403 19946.62 8809 968 10072 11208.78 13364 14368.79 6927 7778.43 18494 20014.55 8924 97 10172 11208.78 13464 1435.87 6668 7812.762 18374 20094.18 9109 977 10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10013 11454.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11244 11851.78 14548.18 14548.89 14549.89 14			12635	14731.96					8855	10122.55
10322 11445.98 12590 14445.45 6740 7962.348 18161 20563.8 8902 99 1048 11375.05 12518 14367.83 6549 7932.921 17731 20419.75 8865 986 10381 11327.38 12749 14283.36 6618 7885.102 18054 20230.03 8681 972 10548 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 960 10562 11041.35 12837 14028.82 7267 7745.325 18222 19978.24 4666 959 10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 955 10581 10972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14068.77 6768 7706.89 18511 19786.67 12986 14081.33 6801 7712.22 18527 19808.43 8791 956 10682 10978.56 12984 14104.16 6863 7730.612 18455 19833.03 8562 960 10408 10978.56 12984 14104.16 6863 7730.612 18455 19878.67 8744 955 10547 110972.74 12998 14286.79 6927 7778.43 18494 20014.55 8829 98 10273 11269.24 14358.7 6668 7812.762 18374 20094.18 9109 977 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10273 11269.24 13955 14360.37 6940 7946.408 18819 2005.5 9618 101 10151 11544.81 13638 14916.87 7003 8124.195 1903 20895.22 9386 102 10244 11851.78 13669 1436.87 7003 8124.195 1903 20895.22 9386 102 10244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105			12915	14624.66					8928	10062.44
10498 11375.05 12518 14367.83 6549 7932.921 17731 20419.75 8865 986 10381 11327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 97 10381 11327.38 12565 14154.38 7029 7833.606 18492 20230.03 8681 972 10348 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 7879 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 960 10680 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10563 11009.65 12644 14016.26 7206 7730.612 18418 19886.9 8918 955 10518 100972.75 13056 14034.53 6897 7717.125 18743 19799.06 8766 955 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10481 10498.56 12984 14104.16 6863 7730.612 18452 19877.53 8739 96 10481 1043.67 12924 14154.55 6833 7740.421 18425 19877.53 8739 96 10418 11043.67 12924 14217.16 6821 7771.074 18403 19946.62 8809 968 10499 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10157 1169.25 13317 14448.88 6819 7849.545 18852 2005.44 9422 985 10172 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 988 10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 111244 11851.78 14351 15246.76 8060 8360.836 19774 21517.08 10106 104 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12244 11851.78 14531 15	10168	11516.91	12910	14527.64			17768	20717.21	9294	9977.384
10381 11327.38 12749 14283.36 6618 7885.102 18054 20312.01 8880 97 10539 11271.57 12614 14228.57 6848 7860.58 18492 2030.03 8681 972 10548 11262.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10680 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10583 11009.72 12882 14013.98 7374 7733.064 18818 19886.9 8918 955 10568 110972.75 13056 14034.53 6897 7717.125 18743 19799.06 8766 955			12590	14445.45	6740	7962.348			8902	9902.53
10539 11271.57 12614 14228.57 6848 7860.58 18492 20230.03 8681 972 10348 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10563 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 95 10586 10943.68 12815 14060.78 7206 7715.898 18394 19786.18 8750 956 10227 10975.07 12986 14081.33 6801 771.25 18521 1980.43 8791 956	10498	11375.05	12518	14367.83	6549	7932.921	17731	20419.75	8865	9860.567
10348 11222.73 12565 14154.38 7029 7833.606 18210 20144.54 8779 965 10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11343.37 12692 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10568 11000.65 12864 14016.26 7206 7733.064 18818 19886.9 8918 955 10586 110972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14068.78 7668 7706.089 18511 19786.18 8750 956 10408 10978.56 12984 1404.16 6863 7730.612 18365 19833.03 8562 960	10381	11327.38	12749	14283.36	6618	7885.102	18054	20312.01	8880	9776.64
10564 11168.09 12961 14116.71 6750 7804.179 18457 20060.22 8687 961 10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 960 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10563 11029.72 12882 14013.98 7374 7733.064 18818 19823.66 8766 95 10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 95 10586 10943.68 12815 14060.78 7206 7715.25 18743 19799.06 8760 955 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10482 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960	10539	11271.57	12614	14228.57	6848	7860.58	18492	20230.03	8681	9729.005
10586 11134.37 12798 14073.34 6763 7784.561 18053 20027.43 9012 960 10680 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10583 11029.72 12882 14013.98 7374 7733.064 18818 1986.9 8918 955 10811 10972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12851 14060.78 7206 7715.898 18349 19782.67 8744 95 10672 10966.93 12281 14068.77 6768 7706.089 18511 19786.18 8759 955 10408 10978.56 12984 14104.16 6863 7730.612 18365 1933.03 8562 960	10348	11222.73	12565	14154.38	7029	7833.606			8779	9659.822
10680 11072.74 12662 14044.8 7026 7749.004 18222 19978.24 8646 959 10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10853 11029.72 12882 14013.98 7374 7733.064 18818 1986.9 8918 955 10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 95 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10427 10975.07 12986 14081.33 6801 7712.22 18527 19808.43 8791 956 10482 10998.33 12874 14145.25 6833 7740.421 18425 19877.53 8739 96 </td <td>10564</td> <td>11168.09</td> <td>12961</td> <td>14116.71</td> <td>6750</td> <td>7804.179</td> <td>18457</td> <td>20060.22</td> <td>8687</td> <td>9614.457</td>	10564	11168.09	12961	14116.71	6750	7804.179	18457	20060.22	8687	9614.457
10562 11041.35 12837 14028.82 7267 7745.325 18220 19927.89 8711 957 10853 11029.72 12882 14013.98 7374 7733.064 18818 19886.9 8918 955 10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 955 10811 10972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10418 11043.67 14445.25 6833 7740.421 18425 19877.53 8739 96	10586	11134.37	12798	14073.34	6763	7784.561	18053	20027.43	9012	9601.981
10853 11029.72 12882 14013.98 7374 7733.064 18818 19886.9 8918 955 10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 95 10811 10972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97	10680	11072.74	12662	14044.8	7026	7749.004	18222	19978.24	8646	9597.444
10568 11000.65 12864 14016.26 7206 7730.612 18418 19823.66 8766 95 10811 10972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10227 10975.07 12986 14081.33 6801 7712.22 18527 19808.43 8791 956 10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10072 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10481 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 </td <td>10562</td> <td>11041.35</td> <td>12837</td> <td>14028.82</td> <td>7267</td> <td>7745.325</td> <td>18220</td> <td>19927.89</td> <td>8711</td> <td>9579.298</td>	10562	11041.35	12837	14028.82	7267	7745.325	18220	19927.89	8711	9579.298
10811 10972.75 13056 14034.53 6897 7717.125 18743 19799.06 8760 955 10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10072 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992	10853	11029.72	12882	14013.98	7374	7733.064			8918	9558.883
10586 10943.68 12815 14060.78 7206 7715.898 18394 19782.67 8744 95 10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10227 10975.07 12986 14081.33 6801 7712.22 18527 19808.43 8791 956 10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10157 11169.25 13317 14448.88 6819 7849.545 18852 2005.44 9422 985 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998	10568	11000.65	12864		7206	7730.612				9544.14
10672 10966.93 12851 14068.77 6768 7706.089 18511 19786.18 8750 956 10227 10975.07 12986 14081.33 6801 7712.22 18527 19808.43 8791 956 10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9109 977 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10405 11332.03 13505 14746.8 6807 7996.679 18901 20705.5 9618 101			13056	14034.53	6897	7717.125	18743	19799.06	8760	9550.944
10227 10975.07 12986 14081.33 6801 7712.22 18527 19808.43 8791 956 10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10298 11123.9 13164 14358.7 6668 7812.762 18374 20094.18 9109 977 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195	10586	10943.68	12815	14060.78			18394	19782.67	8744	9549.81
10408 10978.56 12984 14104.16 6863 7730.612 18365 19833.03 8562 960 10862 10998.33 12874 14145.25 6833 7740.421 18425 19877.53 8739 96 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10298 11123.9 13164 14358.7 6668 7812.762 18374 20094.18 9109 977 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10813 11456.45 13689 14830.12 6972 8044.498	10672	10966.93	12851	14068.77	6768	7706.089	18511	19786.18	8750	9565.688
10862 10998.33 12874 14145.25 6833 7740.421 18425 19877.53 8739 96 10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10298 11123.9 13164 14358.7 6668 7812.762 18374 20094.18 9109 977 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195	10227	10975.07	12986	14081.33	6801	7712.22	18527	19808.43	8791	9566.822
10418 11043.67 12922 14217.16 6821 7771.074 18403 19946.62 8809 968 10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10298 11123.9 13164 14358.7 6668 7812.762 18374 20094.18 9109 977 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11112 11634.34 14040 15013.9 7184 8196.536	10408	10978.56	12984	14104.16			18365	19833.03	8562	9606.518
10479 11072.74 12998 14286.79 6927 7778.43 18494 20014.55 8924 97 10298 11123.9 13164 14358.7 6668 7812.762 18374 20094.18 9109 977 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536	10862	10998.33	12874	14145.25	6833	7740.421	18425	19877.53	8739	9642.81
10298 11123.9 13164 14358.7 6668 7812.762 18374 20094.18 9109 977 10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836	10418	11043.67	12922	14217.16	6821		18403	19946.62	8809	9685.908
10157 11169.25 13317 14448.88 6819 7849.545 18852 20205.44 9422 985 10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836	10479	11072.74	12998	14286.79	6927	7778.43	18494	20014.55	8924	9730.14
10172 11208.78 13450 14549.32 6821 7890.007 18711 20309.67 9545 992 10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	10298	11123.9	13164	14358.7	6668	7812.762	18374	20094.18	9109	9778.908
10273 11269.24 13795 14630.37 6940 7946.408 18819 20417.41 9319 998 10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	10157	11169.25	13317	14448.88	6819	7849.545	18852	20205.44	9422	9850.359
10405 11332.03 13505 14746.8 6807 7996.679 18901 20579.02 9469 100 10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	10172	11208.78	13450	14549.32	6821	7890.007	18711	20309.67	9545	9920.676
10813 11456.45 13689 14830.12 6972 8044.498 19031 20705.5 9618 101 11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	10273	11269.24	13795	14630.37	6940	7946.408	18819	20417.41	9319	9985.323
11015 11544.81 13638 14916.87 7003 8124.195 19036 20895.22 9386 102 11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	10405	11332.03	13505	14746.8	6807	7996.679	18901	20579.02	9469	10074.92
11112 11634.34 14040 15013.9 7184 8196.536 18954 21082.6 9364 103 11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	10813	11456.45	13689	14830.12	6972	8044.498	19031	20705.5	9618	10156.58
11650 11736.67 14430 15134.89 7583 8289.721 19957 21296.92 9900 103 12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	11015	11544.81	13638	14916.87	7003	8124.195	19036	20895.22	9386	10239.37
12244 11851.78 14531 15246.76 8060 8360.836 19774 21517.08 10106 104 12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	11112	11634.34	14040	15013.9	7184	8196.536	18954	21082.6	9364	10321.03
12528 12002.93 15057 15338.07 7877 8435.629 20337 21715 10200 105	11650	11736.67	14430	15134.89	7583	8289.721	19957	21296.92	9900	10385.68
	12244	11851.78	14531	15246.76	8060	8360.836	19774	21517.08	10106	10487.75
12481 12118.04 15141 15433.96 7690 8512.874 19623 21873.1 10356 106	12528	12002.93	15057	15338.07	7877	8435.629	20337	21715	10200	10573.94
	12481	12118.04	15141	15433.96	7690	8512.874	19623	21873.1	10356	10643.13
12667 12221.53 15321 15542.39 7924 8588.893 20360 22065.16 10585 107	12667	12221.53	15321	15542.39	7924	8588.893	20360			
12430 12309.9 15723 15632.57 8216 8655.103 21725 22236.15 10934 108	12430	12309.9				8655.103	21725	22236.15	10934	10812.12
West Midwest Southwest Southeast Northea	West		Midw	est	Sout	hwest			No	rtheast