

Do Orange and Green Clash? Residential Segregation in Northern Ireland

► INTRODUCTION

People of the same social class, occupation, race, ethnicity, and religion often cluster together in a process called **residential segregation**. Although North Americans tend to emphasize racial and ethnic segregation, people have long concentrated (or been forced to concentrate) along social class and religious lines. In early European and Middle Eastern cities, the most obvious feature of segregation was the Jewish ghetto. The term **ghetto** comes from the Italian word *getto*, meaning foundry, because the first ghetto in Venice, in 1516, was on the site of an iron foundry. Jewish residents were confined to certain districts by custom and by law, a process that magnified language and religious differences and contributed to the rampant anti-Semitism of the time.

Residential segregation can result from both voluntary and involuntary forces, although the two are sometimes difficult to separate. **Enclaves** are residential clusters that occur when people choose to live together, for example, to maintain their ethnic identity or to establish control over their territory. Immigrant enclaves such as the Hispanic barrios and Little Saigon of Los Angeles and Little Havana in Miami provide much-needed social support for new immigrants and are seedbeds for new immigrant businesses. They offer a wide array of restaurants, food markets, foreign-language newspapers, temples and churches, social clubs, and traditional medicine to those who live and work there (Figure 12.1). Enclaves also give social groups a measure of political influence that would not be possible if the group were spread out; witness the growing influence of Cuban Americans in South Florida. Currently, Los Angeles is one of the most ethnically and racially diverse cities in the nation due to high rates of immigration (Figure 12.2).

One of the best examples of voluntary segregation is the attraction of working-class and middle-class retirees to retirement communities in high-amenity regions. In these communities, retirees surround themselves with others usually of the same social class and race and pursue interests that befit their retired status: golf, crafts, potluck dinners, dancing, bowling, and so on. Formal age restrictions exclude children under 18 years and limit the community to people over the age of 50 or 55. Social critics argue that while fostering social interaction with like-minded people and an active lifestyle, retirement communities promote exclusivity and an attitude

Until 1993, the white regime in South Africa practiced enforced segregation through a system of **apartheid**. In fact, the word *apartheid* means “separateness” in the Afrikaner language. Under apartheid, whites, “coloureds” (persons of mixed races), and Indians were restricted to certain urban neighborhoods. The white regime established ten homelands for different African peoples and argued that the homelands were, in effect, independent countries. As residents of separate countries, blacks were not seen as citizens of South Africa, and so-called pass laws regulated their movements.

This chapter asks you to evaluate residential segregation along religious lines at the regional scale in Northern Ireland. Religion is the distinguishing feature of the social, political, and economic life. Are Catholics and Protestants integrating into religiously mixed residential environments, or are they becoming more isolated over time? What does this change in residential segregation mean in regard to the search for a permanent solution to the violence and bloodshed that have dominated the country’s recent history?

► CASE STUDY

DO ORANGE AND GREEN CLASH?

GOAL

To examine the changing residential segregation of Catholics and Protestants in Northern Ireland using a series of choropleth maps and **segregation indices** for 1971, 1991, and 2011.

LEARNING OUTCOMES

After completing the chapter, you will be able to:

- Compute an index of residential segregation.
- Use spreadsheet functions.
- Make choropleth maps using a GIS.
- Examine the geographical consequences of ethnic political turmoil.

SPECIAL MATERIALS NEEDED

- Computer with high-speed Internet access and Internet Explorer 6.0 and above. Click on *Help* for system requirements and technical support.

BACKGROUND

Northern Ireland is a land with a long history of political turmoil. Although located on the same island as the independent country of Ireland, it is part of the United Kingdom of Great Britain and Northern Ireland (or United Kingdom [UK]), which also includes England, Scotland, and Wales. Today the population of 1.69 million, with a 2004 per capita gross domestic product of \$23,690, is divided mainly between Catholics (about 44 percent of the population), who are mainly ethnic Irish, and Protestants (about 53 percent), who are predominantly ethnic Scots.

St. Patrick introduced Christianity to Ireland in the fifth century A.D. When the western Christian Church split during the Reformation in the early 1500s, the Irish remained overwhelmingly Catholic while the British became Protestants. Ireland at the time was divided into several local fiefdoms, each dominated by an aristocratic family. Although the British controlled only a small portion of Ireland around Dublin, many people had already given up the Irish language for English, which had been brought to Ireland by earlier English and Norman conquerors. The English monarchs, who had already consolidated British local fiefdoms under a single national government, saw several benefits to a final conquest of Ireland. It would add to their power, spread Protestantism, protect their “back door” from French and Spanish rivals on the continent (who also happened to be Catholic), and, not incidentally, provide a tidy profit to the British crown. In the northern part of Ireland known as Ulster, the O'Neill and O'Donnell ruling families had long resisted British efforts to control them and modify their traditional social system. The turning point came when the British defeated a combined Spanish-Ulster force in the battle of Kinsale in 1601 and shortly thereafter subdued the northern region (Figure 12.3).

As the British consolidated their control over the various parts of Ireland during the sixteenth and seventeenth centuries, they used a **plantation system** to alter the ethnic composition

of entire regions. These are not plantations in the sense of a commercial farm like a coffee plantation, but deliberate, government-sponsored campaigns to “plant” pioneers loyal to the British Crown. Land was forcibly taken from the local Irish aristocracy, many of whom were forced into exile or killed, and given to British aristocrats, military officers, and others whom the king wished to reward. By 1700, less than 1 percent of Irish land was still in Irish Catholic hands.

The key to understanding why today's religious discord is concentrated in the northern part of the island is the difference between the Ulster Plantation and the other plantations (Figure 12.3). In three-quarters of the island, the plantations did not significantly alter the ethnic composition of the population, which remained predominantly Irish Catholic. The British colonizers mainly consisted of a few wealthy Protestant landowners whose land was farmed by local Irish Catholic **tenant farmers** and landless laborers.

Because Ulster had a history of rebelliousness, however, the British government imported large numbers of Scottish and English Protestants as the primary tenant farmers. Irish Catholics who remained in Ulster mainly worked as landless farm laborers or as tenant farmers on infertile farmland. The Ulster Plantation was an efficient and profitable way to control this rebellious territory because the Protestant “plantees,” some of whom were former soldiers, would not only help defend their new land but also pay rent to the British Crown. Over the ensuing centuries, an entirely new Protestant social structure gradually took root in Northern Ireland, ranging from a landholding and industrial elite through a middle class of prosperous farmers to a working class of craftsmen, clerks, and laborers.

Fast forward to the twentieth century. After centuries of British control and Irish resistance to foreign domination, the southern three-quarters of Ireland gained its independence in 1921 as the Irish Free State (changed to the Republic of Ireland in 1949). Northern Ireland, however, remained part of the United Kingdom.

Political violence has plagued Northern Ireland since 1921. Catholics in Northern Ireland (descendants of the Irish tenants of the native aristocracy) resent their exclusion from independent Ireland, foreign domination by the United Kingdom, the loss of their ancestral lands, their lower economic status, and discrimination against them in jobs and local government housing. Protestants are a majority in Northern Ireland; they retain a strong British identity and resist the prospect of becoming a minority in a united Ireland dominated by Catholics. Since about 1969, Northern Ireland has been troubled by terrorist acts and political killings by both sides (Figure 12.4). The extreme Irish nationalist group calling itself the Irish Republican Army (IRA) rekindled a guerilla war against British institutions; paramilitary Protestant groups promoting the “unionist” cause (union with Britain) have responded in kind. An estimated 3,000 people have died in the conflict, including many innocent bystanders.

▶ CASE STUDY (continued)

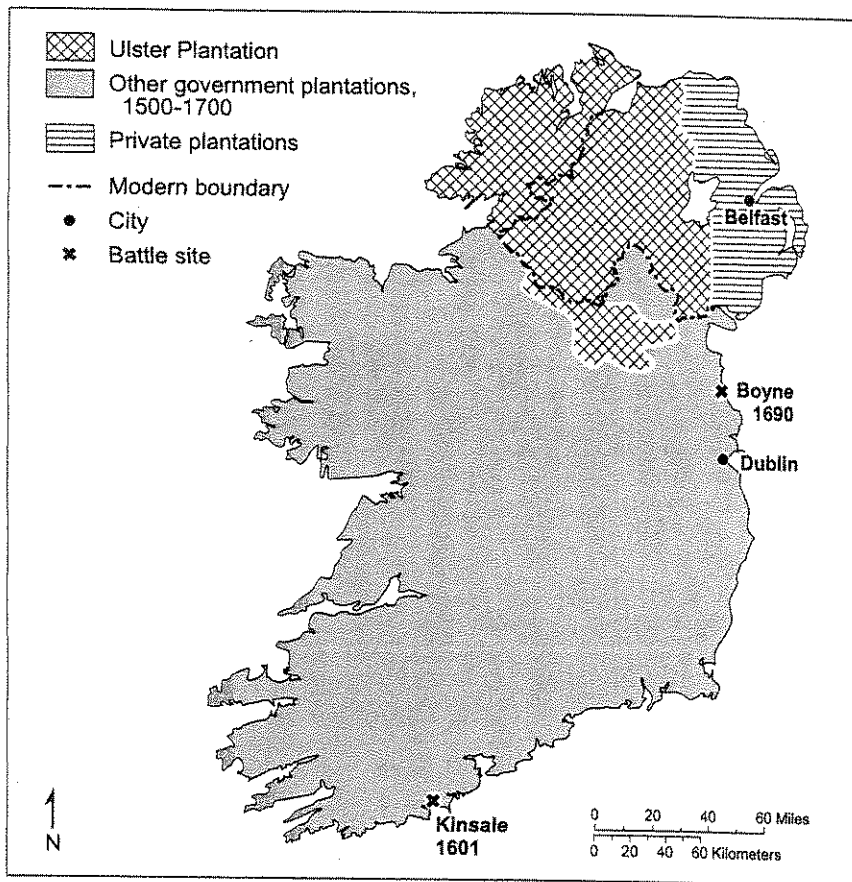


Figure 12.3 The current province of Northern Ireland includes most of the original Ulster Plantation sponsored by the British Crown plus some areas of private colonization, especially around the now capital city of Belfast.

A 1994 cease-fire agreement led to a breaking of the impasse in 1998, with the help of some deft diplomacy by U.S. President Bill Clinton. To bring both sides to the negotiating table, Clinton convinced the British to admit that the Northern Ireland Troubles were not strictly an internal British matter and convinced the Irish nationalist political group, Sinn Féin ("We Ourselves"), that its hopes of reclaiming Northern Ireland were futile as long as it had a pro-British Protestant majority. Once in negotiations, Sinn Féin and the government of Ireland recognized British sovereignty over Northern Ireland in exchange for a dramatic increase in Irish Catholic political power. Details of the historic 1998 "Good Friday Agreement" reveal how difficult it was to forge a compromise:

1. Elections must be held at least once every seven years on whether the majority in Northern Ireland desires to stay part of the United Kingdom.
2. A 108-member elected Northern Ireland Assembly will control education and other local affairs. To ensure that the Protestant Unionist majority does not steamroll

the Catholic Nationalist minority, votes will be decided on the basis of "minority veto" rather than "majority rule" (i.e., both sides must agree).



Figure 12.4 The "car bomb" was a weapon of choice by the Irish Republican Army against British soldiers.

► CASE STUDY (continued)

3. Assembly members must pledge to do their jobs in good faith but are not required to swear allegiance to the Queen of England, and the British Union flag will not fly over the Parliament Building.
4. Ireland changed its constitution to remove its claim of sovereignty over the entire island but will have some say in how things are run in the North through a North-South Ministerial Council.
5. The British government agreed in principle to give policing and judicial authority to local agencies and eliminate the traditional dominance of Protestants in the police force.

Unfortunately, the peace process has not gone smoothly in the wake of the Good Friday Agreement of 1998. Reforms moved slowly, with significant numbers of Protestants feeling that change was coming too quickly and Catholics frustrated at the government's unwillingness to seriously address their grievances. Moreover, Catholics came to believe that the idea of a shared state was not genuinely accepted by Protestants but a grudging concession offered in the face of mounting pressure by British, Irish, and U.S. public opinion. Protestants, in turn, came to question whether Catholics were sincere about giving up their weapons, a process called *decommissioning*.

Alas, the power-sharing government of Belfast collapsed in October 2002, and the British retook control. Violence continued with Protestants complaining they were "airbrushed" out of the negotiating process and the IRA unwilling to stand down in the face of Protestant paramilitarism. Recently, unclassified British documents from 1972 revealed a secret British proposal to deport all Catholics from Northern Ireland in a policy of "ethnic cleansing" (see Chapter 13). Although the plan was never implemented, the fact that it was even considered cast a shadow of distrust over the region.

More recently, the peace process may be back on track. In July 2005, the Irish Republican Army announced that it would resume disarmament and ordered its members to end the armed campaign to overthrow British rule. Calling for change through peaceful democratic means, the IRA move left "no possible excuse" for not implementing the Good Friday Agreement.

Both Catholics and Protestants sponsor fraternal organizations to promote their group identities. Working-class Protestants join the Orange Order, named for William of Orange, the English king who consolidated Protestantism in Great Britain in the 1690s (Figure 12.5). Green, on the other hand, was the color the Catholic Irish adopted, in recognition of their ancestral homeland on the Emerald Isle. The Republic of Ireland flag—three vertical stripes of green, white, and orange—is a symbolic gesture of the hope that Protestants (orange) and Catholics (green) can live in neutral (white) harmony.

The exact percentage of Catholics in Northern Ireland is subject to intense debate because, in the 2001 census, 14 percent of the population said they had no religion or refused to answer the question. Catholics who revealed their religion made up 40 percent of the total population. Of the people

who did indicate their religion, however, 47 percent were Catholic. The census also estimated the "community background" of citizens, which was their religion or the religion in which they were raised. Using this measure, the census indicated 44 percent Catholic, which is the figure we used at the start of this section. In short, 40, 44, and 47 percent are all correct in different ways.

One thing that is certain is that the number of Catholics in Northern Ireland has grown faster than the number of Protestants in recent decades. Historically, Catholic birth rates have been higher, and Protestants have emigrated at a faster rate in search of better economic opportunities (see Chapter 4). The Catholic percentage has risen from 33 percent in 1937 to 38 percent in 1981 to around 44 percent in 2001. Its has long been assumed that the higher Catholic birth rate would eventually lead to Catholics surpassing Protestants in Northern Ireland, which could lead to a majority favoring reunification with Ireland. While the Catholic birth rate recently has been converging toward the Protestant rate, there is demographic momentum (see Chapter 5) on the Catholic side. The Protestant population is older, and Catholics outnumber Protestants from ages 0 to 25. Whether Catholics will eventually become the majority—and if so, when—remains an open question.

How has the political turmoil in Northern Ireland affected the settlement patterns of Catholics and Protestants? From the beginning of the plantation system, Protestants have outnumbered Catholics in the better farmlands of the eastern zone, while Catholics outnumber Protestants in the upland, rockier west. But even within the cities, the two groups tend to reside in separate neighborhoods, especially in working-class areas. Protestants have dominated the public school system, while Catholic children largely attend state-supported church schools. Protestants typically dominate in manufacturing and government jobs, and Catholics dominate in port and construction work.

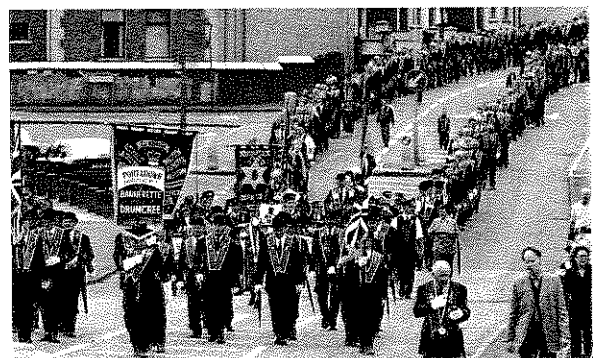


Figure 12.5 Orangemen march in Portadown to commemorate the Battle of Boyne in 1690 when William of Orange, King of England, dealt the final crushing blow to the Irish resistors.

Name: _____ Instructor: _____

Do Orange and Green Clash? Residential Segregation in Northern Ireland

► ACTIVITY 1: MAPPING RELIGIOUS AFFILIATION

- A. To start your activity, log onto the *Human Geography in Action* Web site or insert your CD into your computer.
- B. Select this chapter from the drop-down list, and then click on *Computerized Chapter Activities*.
- C. Click on *Activity 1: Mapping Religious Affiliation*.
- D. On the screen you see a choropleth map of the percentage of Catholics in Northern Ireland for local government districts in 1971. Try moving your mouse over the districts on the map: The percent Catholic will be displayed for the district at which you are pointing.
- E. Like maps in Chapters 1 and 4, this one is an interactive choropleth map that allows you to change the number of classes and the break points between classes. For this exercise, you will assign the same class limits for each year—1971, 1991, and 2011—using the editable break-point boxes. The default map is set to four *Equal Interval* classes, with 16.7 percentage points per class. You must change the number of classes to five and interactively define the class limits. In the editable boxes, enter these class break points from top to bottom:

Break point 1: 12

Break point 2: 33

Break point 3: 57

Break point 4: 65

Select one of the six *Color Schemes* at the bottom of the screen so that a logical progression of colors or shades depicts the trend from high-percent Catholic to low-percent Catholic. Don't just pick a random selection of colors.

- F. Look at the graphic array to the left of your map. This graph shows the distribution of data on the *x*-axis, in this case the percent Catholic for each district, from lowest value to highest value. The *y*-axis is the rank of local government districts from highest to lowest percent Catholic. The vertical bars show your class break points in this distribution. You can see that the class break points now match those you just typed, and the shading patterns between the bars match those of the map.
- G. Click the *Print* button so you can hand in the 1971 map. Check how well the color scheme you chose converts to black and white (those with color printers, of course, need not worry about this). Be sure all classes are easily distinguishable on your printed map. You can go back and change your color scheme after viewing the printed map.

1.4. Does the presence of a larger number of districts in the extreme categories represent greater spatial convergence or divergence?

- I. When you have finished the activity, proceed to *Activity 2*, *exit* from the CD, or *log out* from the Web page. Don't forget your CD if you are using one.

Now that we know *what* the formula is saying, let's try to understand *how* it works. Tables 12.2 through 12.4 show spreadsheets for calculating the segregation index just like those you will calculate in this activity, but with fewer rows. Each of the three spreadsheets is for a hypothetical region with 100,000 Catholics (ethnic group X) and 500,000 non-Catholics (group Y) spread over three districts.

TABLE 12.2 A Three-District Example

| District _i | x_i | y_i | x_i/X | y_i/Y | $x_i/X - y_i/Y$ | $ x_i/X - y_i/Y $ |
|---------------------------------|--------|---------|---------|---------|-----------------|-------------------|
| 1 | 50,000 | 350,000 | 0.5 | 0.7 | -0.2 | 0.2 |
| 2 | 30,000 | 100,000 | 0.3 | 0.2 | 0.1 | 0.1 |
| 3 | 20,000 | 50,000 | 0.2 | 0.1 | 0.1 | 0.1 |
| $X = 100,000 \quad Y = 500,000$ | | | | | | 0.4 Sum |
| | | | | | | 0.2 Index |

Let's begin with Table 12.2, a region with mild segregation. Look at the first row, which calculates $|x_1/X - y_1/Y|$. The first part of this term, x_1/X , is the fraction of the total Catholic population that lives in district 1. District 1 contains 50,000 Catholics out of 100,000 total Catholics in the whole country, so $x_1/X = 0.5$. The second term, y_1/Y , is the fraction of the non-Catholic population in district 1, which is 350,000/500,000, or 0.7. The difference between these two decimal fractions, $x_1/X - y_1/Y$, is equal to $0.5 - 0.7$, or -0.2 . In other words, district 1 contains 50 percent of the country's Catholics but 70 percent of its non-Catholics, so you could say there's a "Catholic deficit" of 20 percent, signified by the -0.2 value. Likewise, districts 2 and 3 have Catholic "surpluses" of $+0.1$.

Why does the formula use absolute values? Notice that the three values in the $x_i/X - y_i/Y$ column add up to 0. This is no coincidence: it will always be the case. A surplus of an ethnic group in some districts is always canceled out by offsetting deficits of that group in other districts. By taking the absolute values of the differences, this canceling effect is avoided. You can think of the absolute value as measuring just the *size* of the difference; in other words, how far is the district from having equal percentages of both groups? In Table 12.2, adding all the $|x_i/X - y_i/Y|$ s for all three rows yields a sum of 0.4. This is the sum of the sizes of the percentage differences for all three districts. The final segregation index is exactly half of that value, or 0.2.

Why is the final summation multiplied by 0.5 in the formula? The reason can be seen in Table 12.3, an example of complete segregation. All the Xs (Catholics) live in district 3, and none of the Ys (non-Catholics). Therefore,

$$\left| \frac{x_3}{X} - \frac{y_3}{Y} \right| \text{ equals } \left| \frac{100,000}{100,000} - \frac{0}{500,000} \right|,$$

or $|1 - 0| = 1$. Likewise, in districts 1 and 2, which contain 100 percent of the non-Catholics and 0 percent of the Catholics, the absolute differences of 0.4 and 0.6 also add up to 1. In a completely segregated country such as this, the sum of the absolute differences will always add up to 2. Therefore, to create an index with a scale from 0 to 1 instead of from 0 to 2, the sum is multiplied by 0.5.

TABLE 12.3 A Completely Segregated Example

| District _i | x_i | y_i | x_i/X | y_i/Y | $x_i/X - y_i/Y$ | $ x_i/X - y_i/Y $ |
|---------------------------------|---------|---------|---------|---------|-----------------|-------------------|
| 1 | — | 200,000 | 0 | 0.4 | -0.4 | 0.4 |
| 2 | — | 300,000 | 0 | 0.6 | -0.6 | 0.6 |
| 3 | 100,000 | — | 1 | 0 | 1 | 1 |
| $X = 100,000 \quad Y = 500,000$ | | | | | | |
| | | | | | | 2 Sum |
| | | | | | | 1 Index |

Finally, Table 12.4 shows the opposite extreme of complete integration of the two ethnic groups. In this case, equal percentages of Catholics and non-Catholics in each district yield a segregation index of 0.

TABLE 12.4 An Example in Which Both Groups Have Identical Distributions

| District _i | x_i | y_i | x_i/X | y_i/Y | $x_i/X - y_i/Y$ | $ x_i/X - y_i/Y $ |
|---------------------------------|--------|---------|---------|---------|-----------------|-------------------|
| 1 | 70,000 | 350,000 | 0.7 | 0.7 | 0 | 0 |
| 2 | 20,000 | 100,000 | 0.2 | 0.2 | 0 | 0 |
| 3 | 10,000 | 50,000 | 0.1 | 0.1 | 0 | 0 |
| $X = 100,000 \quad Y = 500,000$ | | | | | | |
| | | | | | | 0 Sum |
| | | | | | | 0 Index |

Use the spreadsheets for 1971, 1991, and 2011 to calculate the index of segregation for each year.

- To start your activity, log onto the *Human Geography in Action* Web site or insert your CD into your computer.
- Select this chapter from the drop-down list, and then click on *Computerized Chapter Activities*.
- Click on *Activity 2: Index of Segregation*.

You will see a spreadsheet for 1971 with all the information you need. You will calculate the 1971 index first. The columns are as follows:

- | | |
|------------------------|---|
| Column A: $District_i$ | The name of the local government district. |
| Column B: x_i | The number of Catholics in each local government district. |
| Column C: y_i | The number of non-Catholics in each local government district. |
| Column D: x_i/X | The number of Catholics in District i divided by the total number of Catholics in Northern Ireland. |
| Column E: y_i/Y | The number of non-Catholics in District i divided by the total number of non-Catholics in Northern Ireland. |

Column F: $x_i/X - y_i/Y$ The difference between the Northern Ireland percentages of Catholics and non-Catholics in each local government district. This is a preliminary step in calculating the segregation index.

Column G: $|x_i/X - y_i/Y|$ The absolute value of the previous column.

In a spreadsheet, each value is referenced according to the cell in which it is located. The letter of the column and the number of the row identify a cell. For instance, the number of Catholics in Antrim is in cell B2. The spreadsheet software will calculate values much like a calculator does if you tell it what formula to use and which cells to use in the formula.

- D. Your first step is to divide the number of Catholics in the first district (x_{Antrim}) by the total number of Catholics in Northern Ireland (X). The total number of Catholics is in cell B28, at the bottom of Column B below the individual district values. You can scroll down the spreadsheet to find cell B28 by using the scroll bar on the right-hand side of the spreadsheet. For your convenience, the value of X for 1971 is also listed at the top of the screen as 558,800.

Click in cell D2, the first empty cell where you must calculate x_i/X . Type in the following formula:

$$= B2/558800$$

The $=$ is a code that tells the spreadsheet that you are entering a formula, not a number. This formula tells the software to divide cell B2 by 558800. An alternative to typing this formula using the keyboard is to use the formula buttons at the top right. Click the $=$ button, type B2, click the \div button, and then type in 558800. Whichever way you enter the formula into the cell, click out of the cell (on any other cell) to see the calculated value.

If you make a mistake, this message will appear: *The formula you have entered is incorrect. Try again.* Click OK, and then return to the cell and edit or reenter the formula, following our instructions exactly. If you ever wish to restart the spreadsheet completely, go to the *View* menu and select *Refresh*.

- E. Copy this formula to the entire Column D. First, click back into cell D2 to highlight the formula. Second, click on *Copy* in the upper left. This copies the formula from cell D2 into a buffer that the computer remembers. Third, click on the *Column D* header to highlight the entire column. Fourth, click on the word *Paste* in the upper left. The computer has now copied the formula from cell D2 into each of the cells below it and has modified each formula to divide the B-column cells immediately to the left rather than always dividing cell B2.
- F. Divide the number of non-Catholics per district by the total number of non-Catholics, much like you did in Step D for Catholics. For all of Northern Ireland, Y , the total of non-Catholics in 1971 was 960,300, which can be found in cell C28 or at the top of the screen. Click on cell E2 and type:

$$= C2/960300$$

Click out to see the result. Then follow the *Copy* and *Paste* commands from Step E to copy this formula into Column E. All cell locations are updated when you paste the formula to the new cells.

- G. Now you need to subtract the non-Catholic ratios from the Catholic ratios. Click on cell F2, type the following, and click out:

$$= D2-E2$$

Copy this formula and *paste* it into all the cells for Column F.

- H. Next, you must take the absolute value of each cell. The spreadsheet has a built-in function that converts a cell to absolute value. It is calculated by the operator *Abs*. Therefore, click on cell G2, and use the buttons and/or the keyboard to create the equation:

$$= \text{Abs}(F2)$$

Copy this formula and *paste* it into all the cells for Column G.

- I. You now have the values you need to calculate *S*, the segregation index. Click on cell G28, just below the last column of values. You need to sum, or add up, all values in this column according to the formula. We will again use a spreadsheet function, this time the button Σ . Scroll down to row 28. Click on cell G28. You will now replace the formula you just inadvertently put there when you copied G2 and pasted it into the entire Column G. Press the = button, then the Σ button, and then type (G2:G27). Your formula should look like this:

$$= \text{SUM}(G2:G27)$$

This command sums all values from cell G2 through cell G27.

- J. As the formula indicates, the one final step is to multiply this value by 0.5. Click on cell G29, and type the following exactly as it appears.

$$= G28*0.5$$

The value in G29 is the segregation index *S* for the year 1971. If done correctly, you will receive a congratulatory message on the screen that says you have completed this spreadsheet. Click *OK*, and then click on *Print* in the right margin.

- K. You must now repeat the preceding steps to calculate *S* for 1991 and 2011. Click on the year in the right margin and fill out each spreadsheet. Remember to substitute the 1991 and 2011 totals of Catholics and non-Catholics for the 558800 and 960300 figures, which applied only to 1971. The later values of *X* and *Y* can be found in cells B28 and C28 of each spreadsheet or at the top of the screen. Print out and hand in a completed spreadsheet for each year.

The index of segregation has a minimum value of zero, meaning Catholics would be distributed evenly throughout the Northern Ireland population. Larger numbers (with a maximum value of 1.0) would signify higher levels of segregation as Catholics and non-Catholics diverge spatially. The segregation index is the proportion of the Catholic population that must relocate to achieve a perfectly integrated distribution of Catholics and non-Catholics.

2.1. List your indices here:

| | |
|------|-------|
| 1971 | _____ |
| 1991 | _____ |
| 2011 | _____ |

2.2. Are Catholics becoming more or less segregated with respect to non-Catholics in Northern Ireland?

2.3. Describe how both the map patterns and the segregation indices show changes in segregation over time.

2.4. What are the long-term consequences of these changes in residential patterns? How do you think these changes could affect issues of religious tolerance, cultural pluralism (an acceptance of multiple cultures living together), and future negotiations for political change?

- L. When you have finished the activity, *exit* from the CD or *log out* from the Web page. Don't forget your CD if you are using one.