# Section 3: Case Study – Tally Up

**Relates to Questions 17-27**

**Time Allocated: 36 minutes.**

## INTRODUCTION

An election has been held for the Congress in the fictional country of Excelstan.  Excelstan is a small country and is divided into 9 Districts, named after letters of the Greek alphabet.  Each District elects one member to Congress.  There are 1000 voters.  Each voter is assigned a District Code based on where they live.  The District Code is a number between 105 and 194 and determines what District the voter votes for.

| District Code | District |
|---------------|----------|
| 105 - 114 | Alpha |
| 115 - 124 | Beta |
| 125 - 134 | Gamma |
| 135 - 144 | Delta |
| 145 - 154 | Epsilon |
| 155 - 164 | Zeta |
| 165 - 174 | Eta |
| 175 - 184 | Theta |
| 185 - 194 | Iota |

There are 8 political parties in Excelstan competing for seats in the Congress.

The parties are *Red, Orange, Yellow, Green, Blue, Purple, Brown and Black.*

Voters cast their ballot by numbering 1 against their first choice.  After this, they can choose to provide preferences by numbering 2 against their second choice, 3 against their third choice, and so on up to 8 against their eighth choice.  Voters can choose how far down they give preferences to. In the data provided, every voter has voted for either 4, 5, 6, 7 or 8 parties in preferential order.

When counting votes, if a voter has not provided a preference number against a particular party, assume they gave that party an 8 (i.e. they ranked any unmarked party equal last).

**Each District is counted independently of the other Districts, using only the votes from that District.**

## COUNTING THE VOTES

Excelstan has two different systems for counting votes to determine which party wins each District.

Counting System 1: First Past The Post

Counting System 2: Points Allocation (also known as 'Eurovision style')

## COUNTING SYSTEM 1: FIRST PAST THE POST

The party with the most number of "1" votes wins. If two or more parties tie for the most number of "1" votes, then the winner is the party that received the most "2" votes (from the set of parties that tied for the most "1" votes). If there is still a tie, then count the "3" votes and so on until a winner is determined.

## COUNTING SYSTEM 2: POINTS ALLOCATION

Parties receive points for each vote. The better the preference, the more points received.

| Vote Preference | Points |
|---|---|
| 1 | 12 |
| 2 | 10 |
| 3 | 8 |
| 4 | 6 |
| 5 | 4 |
| 6 | 2 |
| 7 | 1 |
| 8 | 0 |

The party with the highest number of points wins the District.

*The workbook provided contains all of the voting data. In order to answer all of the questions, you will need to use the rules of each counting system below to determine the winning party or parties for each District under each counting system.*

Questions 17 to 19 and 26 relate to multiple Counting Systems.
Questions 20 to 22 relate to Counting System 1: First Past the Post
Questions 23 to 25 relate to Counting System 2: Points Allocation

**For Questions 17 to 24, select your answer from a multiple choice list.**
**For Questions 25 to 26, you are required to type in your answer.**

**Prepare your model and then use it to answer the given questions.**
**When finished, please upload your workbook (Question 27).**

**QUESTIONS**

**Question 17**
**How many voters are there in the Delta District?**

A.113

B. 114

C. 115

D. 116

E. 117

F. 118

G. 119

H. 120

I. 121

**Question 18**
**Which District has the smallest number of voters?**

A. Alpha

B. Beta

C. Gamma

D. Delta

E. Epsilon

F. Zeta

G. Eta

H. Theta

I. Iota

**Question 19**
**What was the highest number of first preferences received by the Orange party in any District?**

A. 11

B. 12

C. 13

D. 14

E. 15

F. 16

G. 17

H. 18

I. 19

**Question 20**
**Using the First Past The Post method, which party won the Beta District?**

A. Red

B. Orange

C. Yellow

D. Green

E. Blue

F. Purple

G. Brown

H. Black

**Question 21**
**Using the First Past The Post method, which party won the Alpha District?**

A. Red

B. Orange

C. Yellow

D. Green

E. Blue

F. Purple

G. Brown

H. Black

**Question 22**
**Using the First Past the Post Method, one Party did not win any Districts. Which party is this?**

A. Red

B. Orange

C. Yellow

D. Green

E. Blue

F. Purple

G. Brown

H. Black

**Question 23**
**Using the Points Allocation method, which party won the Epsilon District?**

A. Red

B. Orange

C. Yellow

D. Green

E. Blue

F. Purple

G. Brown

H. Black

**Question 24**
**Using the Points Allocation method, what was the maximum number of Districts won by a single party?**

A. 0

B. 1

C. 2

D. 3

E. 4

F. 5

G. 6

H. 7

I. 8

**Question 25**
**Under the points allocation method, how many parties did not win any Districts?**

*Type in your answer*


**Question 26**
**Consider all of the Districts that have a different winner when First Past The Post is used compared to when Points Allocation is used. Take the first letter of each of these District names and combine those letters (in the order Alpha, Beta, Gamma, Delta, Epsilon, Zeta, Eta, Theta, Iota) to form a word.  What is that word? (Give your answer all in capital letters)**

# Answers

| 17 | C |
|----|------|
| 18 | B |
| 19 | I |
| 20 | A |
| 21 | D |
| 22 | F |
| 23 | F |
| 24 | D |
| 25 | 4 |
| 26 | EZTI |