

## Problem A: Group Affinity and Fashion Sense

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### **Problem:**

The solution below is a model of the popularity of the behavioral and stylistic trend known as “hipster.” For the purpose of this model, a hipster is defined as a person who does not conform to societal and/or social norms, especially those relating to style and outward appearance. However, in an attempt to find individuality and uniqueness, the trend inevitably grows so much that the people contributing to it begin to conform to the signature look of the hipster. Thus falling into the same categorization of majority that they were initially trying to escape from. To maintain their “hip-factor” they end up reverting back to what they were; which for the purpose of this model will be known as an anti-hipster. An anti-hipster can be defined as someone who conforms to societal and social norms, or someone who is absent from the consideration of such norms. Consequently, there is a constant back and forth between the style and look of hipsters and anti-hipsters. Neither will go to zero, else the counterpart would be the potential permanent circumstance of society, which is well known to fluctuate over time. Hipsters first emerged in the 1940s with what were known as “hepcats.” Similar nonconformity instances peaked around the 1970s and 2000s. This implies that there is a tendency of nonconformist social groups to apex about every 30 years.

### **Assumptions:**

- Established a steady-state group of people (no population growth).
- When a certain number of people turn into a hipster, they will begin turning back into anti-hipsters.
- Fisher cycle repeats every 15 years, with reversed roles.
- All influences that would encourage change are localized to the analyzed area, such that there are no outside sources of influence.

### **Key Points:**

- The primary aspect that is being changed is people’s outward appearance. Hipsters have a distinctly different look to conformists.
- When people are subjected to hipster culture there is some probability that they will become a hipster. This is due to information spread through physical proximity, as well as social media or pop culture.
- As hipsters and anti-hipsters interact, they affect each other socially and stylistically. As anti-conformity becomes more popular, the population of anti-hipsters will decrease because there is no longer a sense of individuality. The graph exemplifies this behavior.
- The sum of the hipster and anti-hipster populations cannot exceed the total population. When any subgroup is large enough to be the majority, the population of that group

begins to decline in an attempt to be different. The higher the  $\beta$  value, the higher the rate at which people change from one group to another. The velocity of the wave dictates how fast the hipster culture moves through a given area. The lower the velocity, the longer it takes for the hipster culture to make contact with anti-hipster culture.

- From a pool of 100 people, 10 of which are hipsters, there will be an increase in hipster fashion until about 90 of the people are hipsters. Then, there will be a relapse and anti-hipster will become the new hipster, until that sect reaches 90% of the population. The relapse is caused by the extreme likeness of the hipster community.

**Solution:**

Fisher Wave Equation

$$\frac{\partial H}{\partial t} = D_H \frac{\partial^2 H}{\partial x^2} + \beta AH$$

Velocity

$$v_{min}^2 = 4D_H\beta A$$

Simplification of Variables

$$u = x - vt$$

Anti-Hipster

$$Population_{total} - H = A$$

Wave in one Variable (u)

$$0 = D_H H'' + vH' + \beta AH$$

$H$  - Hipster population

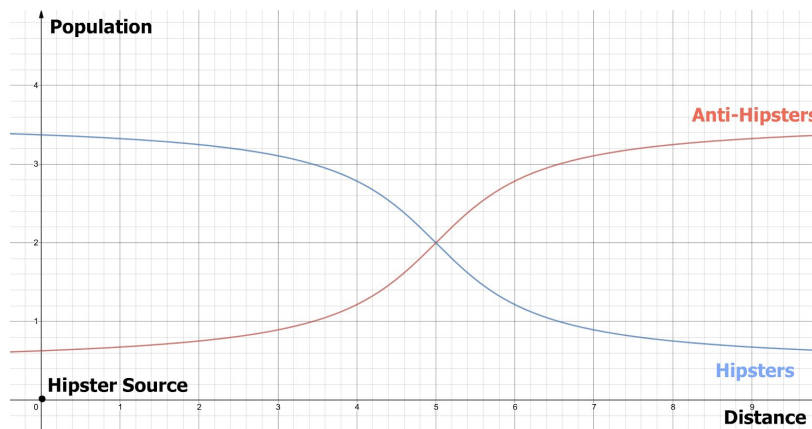
$A$  - Anti-hipster population

$\beta$  - Propensity for hipsters to turn into anti-hipsters

$v$  - Velocity of the wave, km/year

$D_H$  - Diffusion rate of hipsters

$t$  - Time in years



**Conclusion:**

In the fullness of time, the population graph's rise and fall for both hipsters and anti-hipsters will repeat itself. This is evident in the real world as subcultures of non-conformity periodically rise to the majority and fall back into obscurity.