# Engineering and Engineering Technologies College Computer Techniques Engineering Department Engineering Mathematics Second Stage - First Course



كلية الهندسة والتقنيات الهندسية قسم تقنيات الحاسوب مادة الرياضيات الهندسية المرحلة الثانية - الكورس الاول

# 1: Basic terminology, Populations and Samples.

1: المصطلحات الأساسية, المجتمع والعينات.

### **What is Probability?**

Probability theory is the study of the mathematical rules that govern random events.

#### What is Statistics?

Statistics is the application of probability to the collection, analysis, and description of random data.

Statistics is used to:

I Design experiments

I Summarize data

I Make conclusions about the world

I Explore complex data

# **Applications of Probability and Statistics in Computer Science:**

- Machine Learning
- Data Mining
- Artificial Intelligence
- Simulation
- Image Processing
- Computer Graphics
- Visualization
- Software Testing
- Algorithms

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# **Applications of Probability and Statistics General:**

- Gambling (not recommended)
- Stock Market Analysis
- Politics
- Sports
- Demographics
- Medicine
- Economics
- All Sciences!!

# Alan Turing: Connecting CS and Probability

"Father of Computer Science"

# Most famous for:

- Computability, Turing machine
- Stored-program computer
- Turing test
- WWII cryptanalysis
- Wrote a dissertation on probability theory!
- Turing used probability and statistics to crack Enigma

