The Use of Programming Languages in Sports Data Analytics.

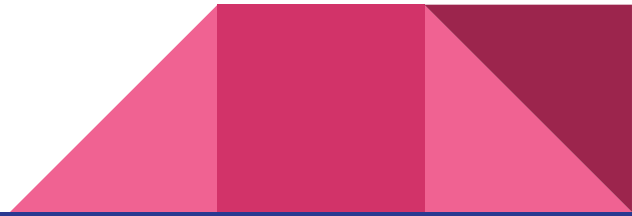
What is Sports Analytics?

- Based on research done during WWII that enhanced warfare operations using data analysis.
- The use of “digital software to collect, process and interpret data to achieve one or more specific goals that further athletic competition or the business of athletics” (JWU).

Programming Languages

1. Python
    a. Various libraries make it an easy tool for data analytics
        i. Pandas: Data manipulation
        ii. NumPy: numerical analysis
        iii. Matplotlib: Data visualization
2. SQL (Structured Query Language)
    a. Looks at data stored in databases
    b. Retrieves and managages large data sets
3. R
    a. Data Visualization and Statistical analysis

(Amritha K)



Python

1. Functions
    a. Ability to work with database systems
    b. Works with large data sets, and can perform complex math
        i. Makes it good for statistical analysis
2. Language
    a. Similar to that of the english language
    b. Influenced by math in the way that syntax is written
        i. Recognizes mathematical operations
    c. Uses indentation to iterate the scope of loops and function
    d. Uses phrases such as For, If…Else, and While

(W3Schools, Python Introduction)

How SQL works

1. Relational Database Management System
   a. Basis for SQL
   b. Stored in tables, which are made up of fields
   c. Fields designate what specific information is kept in a certain column in the table
   d. Rows/records is each individual horizontal entry in a table
2. Language
   a. Not case sensitive can be upper or lowercase
   b. At the end of each statement ;
      i. Allows multiple statements to be executed at the same time

(W3Schools, SQL Introduction)

R

1. Functions
    a. Statistical Analysis
    b. Graphing
    c. Data analysis and representation
2. Language
    a. To write text put it in single or double quotes
    b. To write numbers just write the number or mathematical operation
    c. Can use brackets for the print function and For loops
    d. To assign a value to a variable write: variable name <- value
    e. Variable names are case sensitive
3. Statistical
    a. dim()= dimensions of data set
    b. names()= names of variables
    c. Call data set to see it by typing name of data set
    d. Summary()
        i. Returns: min, first quantile, median, mean, third quantile, and max

(W3Schools, R Introduction)

How is Sports Analytics Used?

1. Talent Recruitment
2. Coaching and Player development
3. Performance Optimization
4. Improvement and Monitoring of Fan engagement and experience
5. Sponsorship and Revenue Growth

(JWU)

Sports that Use Data Analytics

1. Soccer
    a. Improve player performance
    b. Positioning, fatigue, distance run
2. Baseball
    a. Batting Average (player tendencies and pitches they swing at)
    b. On-Base Percentage
    c. Slugging Percentage (#of bases player earns on hits)
3. Basketball
    a. Tracks player performance and tendencies
    b. Use cameras to track movements to create full statistical breakdowns

(Pykes)

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