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| --- | --- | --- | --- | --- | --- | --- |
| Question | Effect type | Estimand = causal affect of interest | Estimator = model we fit and what part is the estimate of the estimand | Notes | Simplified Dag | Simplified dag code |
| What is the effect of batting in the first innings compared to the second innings on total runs? | Total Effect | Average effect of batting during the 1st  innings on total runs | Total runs ~ batting(y/n) + (1|Team) + (1|Opposition) + (1|Match) |  |  | dag {  Batting [exposure,pos="-1.541,-0.865"]  Innings [adjusted,pos="-1.539,-1.115"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.745,-0.644"]  Team [pos="-1.804,-1.109"]  Toss\_outcome [pos="-1.921,-0.868"]  Total\_Runs [outcome,pos="-1.086,-0.862"]  Batting -> Total\_Runs  Batting <-> Innings  Match -> Opposition  Match -> Team  Opposition -> Toss\_outcome  Opposition -> Total\_Runs  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of batting in the first innings compared to the second innings on total balls faced? | Total Effect | Average effect of batting during the 1st  innings on total overs | Total overs ~ batting team+ 1st inning + Match |  |  | dag {  Batting [exposure,pos="-1.541,-0.865"]  Innings [adjusted,pos="-1.539,-1.115"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.745,-0.644"]  Team [pos="-1.804,-1.109"]  Toss\_outcome [pos="-1.921,-0.868"]  Total\_Balls\_Faced [outcome,pos="-1.086,-0.862"]  Batting -> Total\_Balls\_Faced  Batting <-> Innings  Match -> Opposition  Match -> Team  Opposition -> Toss\_outcome  Opposition -> Total\_Balls\_Faced  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of batting in the first innings compared to the second innings on wickets lost? | Total Effect | Average effect of batting during the 1st  innings on total wickets lost | Total wickets lost ~ batting team+ 1st inning + Match |  |  | dag {  Batting [exposure,pos="-1.541,-0.865"]  Innings [adjusted,pos="-1.539,-1.115"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.745,-0.644"]  Team [pos="-1.804,-1.109"]  Toss\_outcome [pos="-1.921,-0.868"]  Total\_Wickets\_Lost [outcome,pos="-1.086,-0.862"]  Batting -> Total\_Wickets\_Lost  Batting <-> Innings  Match -> Opposition  Match -> Team  Opposition -> Toss\_outcome  Opposition -> Total\_Wickets\_Lost  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of batting in the first innings compared to the second innings on winning? | Total Effect | Average effect of batting during the 1st  innings on winning | Winning ~ batting team+ 1st inning + Match |  |  | dag {  "Win/Lose" [outcome,pos="-1.086,-0.862"]  Batting [exposure,pos="-1.541,-0.865"]  Innings [adjusted,pos="-1.539,-1.115"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.745,-0.644"]  Team [pos="-1.804,-1.109"]  Toss\_outcome [pos="-1.921,-0.868"]  Batting -> "Win/Lose"  Batting <-> Innings  Match -> Opposition  Match -> Team  Opposition -> "Win/Lose"  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of the toss outcome on match result? What is the effect of winning the toss on match result? (i.e. do teams that win the toss go on to win the match more often than not?) | Total Effect | Average effect of winning the toss on match outcome | Winning ~ toss outcome + match |  |  | dag {  "Win/Lose" [outcome,pos="-1.357,-0.875"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.799,-0.662"]  Team [pos="-1.804,-1.109"]  Toss\_outcome [exposure,pos="-1.788,-0.875"]  Match -> Opposition  Match -> Team  Opposition -> Toss\_outcome  Team -> Toss\_outcome  Toss\_outcome -> "Win/Lose"  } |
| What is the effect of batting in the first innings compared to the second innings on the style of batting? (number of 1&2s compared to boundaries (4s and 6s)? | Total Effect |  |  | Multivariate model |  | dag {  1s [outcome,pos="-0.682,-0.788"]  2s [outcome,pos="-0.416,-0.851"]  4s [outcome,pos="-0.194,-0.911"]  6s [outcome,pos="0.015,-0.970"]  Batting [exposure,pos="-1.541,-0.865"]  Bowling\_Type [pos="-1.027,-0.279"]  Dot\_Ball [outcome,pos="-0.891,-0.725"]  Extras [pos="-0.226,-0.308"]  Innings [pos="-1.551,-1.263"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.689,-0.247"]  Team [pos="-1.880,-1.269"]  Toss\_outcome [pos="-1.836,-0.871"]  Batting -> 1s  Batting -> 2s  Batting -> 4s  Batting -> 6s  Batting -> Bowling\_Type  Batting -> Dot\_Ball  Batting -> Extras  Batting <-> Innings  Bowling\_Type -> 1s  Bowling\_Type -> 2s  Bowling\_Type -> 4s  Bowling\_Type -> 6s  Bowling\_Type -> Dot\_Ball  Bowling\_Type -> Extras  Extras -> 1s  Extras -> 2s  Extras -> 4s  Extras -> 6s  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of, dotballs, 1s, 2s, 4, 6s scored on winning? (i.e does the team that score more 1s also win) | Total Effect |  |  |  |  | dag {  "Win/Lose" [outcome,pos="-0.494,-0.898"]  1s [exposure,pos="-1.175,-0.988"]  2s [exposure,pos="-1.041,-0.873"]  4s [exposure,pos="-0.923,-0.759"]  6s [exposure,pos="-0.816,-0.638"]  Batting [pos="-1.541,-0.865"]  Bowling\_Type [pos="-1.424,-0.539"]  Dot\_Ball [exposure,pos="-1.306,-1.131"]  Extras [pos="-1.209,-0.238"]  Innings [adjusted,pos="-1.551,-1.263"]  Match [pos="-2.255,-0.863"]  Opposition [pos="-1.689,-0.247"]  Team [pos="-1.880,-1.269"]  Toss\_outcome [pos="-1.921,-0.868"]  1s -> "Win/Lose"  2s -> "Win/Lose"  4s -> "Win/Lose"  6s -> "Win/Lose"  Batting -> 1s  Batting -> 2s  Batting -> 4s  Batting -> 6s  Batting -> Bowling\_Type  Batting -> Dot\_Ball  Batting <-> Innings  Bowling\_Type -> 1s  Bowling\_Type -> 2s  Bowling\_Type -> 4s  Bowling\_Type -> 6s  Bowling\_Type -> Dot\_Ball  Bowling\_Type -> Extras  Dot\_Ball -> "Win/Lose"  Extras -> 1s  Extras -> 2s  Extras -> 4s  Extras -> 6s  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Extras  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of bowling type (Spin/Seam) on total overs faced?  *What is the effect of bowling seam overs on total overs faced?*  *What is the effect of bowling spin overs on total overs faced?* | Total Effect |  |  | Proportion of spin/seam overs faced. Treat these 2 questions together. 50 possible overs max, out of the overs faced by the batting team, what is the proportion of overs faced that are spin/seam |  | dag {  "Win/Lose" [outcome,pos="-0.874,-0.539"]  Batting [adjusted,pos="-1.541,-0.865"]  Bowling\_Type [exposure,pos="-1.424,-0.539"]  Innings [adjusted,pos="-1.551,-1.263"]  Match [pos="-2.255,-0.863"]  Opposition [pos="-1.919,-0.548"]  Team [pos="-1.919,-1.185"]  Toss\_outcome [pos="-1.921,-0.868"]  Batting -> Bowling\_Type  Batting <-> Innings  Bowling\_Type -> "Win/Lose"  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of bowling type on total wickets lost? | Total Effect |  |  | Does bowling spin or seam lead to more wickets? |  | dag {  Batting [adjusted,pos="-1.541,-0.865"]  Bowling\_Type [exposure,pos="-1.544,-0.546"]  Innings [adjusted,pos="-1.551,-1.263"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.919,-0.548"]  Team [adjusted,pos="-1.919,-1.185"]  Toss\_outcome [adjusted,pos="-1.921,-0.868"]  Total\_Wickets\_Lost [outcome,pos="-0.874,-0.539"]  Batting -> Bowling\_Type  Batting -> Total\_Wickets\_Lost  Batting <-> Innings  Bowling\_Type -> Total\_Wickets\_Lost  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of innings on bowling type? |  |  |  |  |  | dag {  Batting [adjusted,pos="-1.541,-0.865"]  Bowling\_Type [outcome,pos="-1.526,-0.546"]  Innings [exposure,pos="-1.551,-1.263"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.919,-0.548"]  Team [adjusted,pos="-1.919,-1.185"]  Toss\_outcome [adjusted,pos="-1.921,-0.868"]  Total\_Wickets\_Lost [pos="-0.172,-0.508"]  Batting -> Bowling\_Type  Batting <-> Innings  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of bowling type on total runs scored? |  |  |  |  |  | dag {  Batting [adjusted,pos="-1.541,-0.865"]  Bowling\_Type [exposure,pos="-1.526,-0.546"]  Innings [adjusted,pos="-1.551,-1.263"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.919,-0.548"]  Team [adjusted,pos="-1.919,-1.185"]  Toss\_outcome [adjusted,pos="-1.921,-0.868"]  Total\_Runs [outcome,pos="-0.960,-0.548"]  Batting -> Bowling\_Type  Batting <-> Innings  Bowling\_Type -> Total\_Runs  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of bowling type on winning? | Total Effect |  |  |  |  | dag {  "Win/Lose" [outcome,pos="-0.960,-0.548"]  Batting [adjusted,pos="-1.541,-0.865"]  Bowling\_Type [exposure,pos="-1.526,-0.546"]  Innings [adjusted,pos="-1.551,-1.263"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.919,-0.548"]  Team [adjusted,pos="-1.919,-1.185"]  Toss\_outcome [adjusted,pos="-1.921,-0.868"]  Batting -> Bowling\_Type  Batting <-> Innings  Bowling\_Type -> "Win/Lose"  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of bowling type on total extras? | Direct Effect |  |  |  |  | dag {  Batting [adjusted,pos="-1.541,-0.865"]  Bowling\_Type [exposure,pos="-1.526,-0.546"]  Extras [outcome,pos="-0.960,-0.548"]  Innings [adjusted,pos="-1.551,-1.263"]  Match [adjusted,pos="-2.255,-0.863"]  Opposition [adjusted,pos="-1.919,-0.548"]  Team [adjusted,pos="-1.919,-1.185"]  Toss\_outcome [adjusted,pos="-1.921,-0.868"]  Batting -> Bowling\_Type  Batting <-> Innings  Bowling\_Type -> Extras  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of extras on winning? (extras = no balls, wides, byes, leg byes) | Total Effect |  |  |  |  | dag {  "Win/Lose" [outcome,pos="-1.332,-0.781"]  Batting [pos="-1.703,-0.867"]  Bowling\_Type [pos="-1.697,-0.690"]  Extras [exposure,pos="-1.508,-0.783"]  Innings [adjusted,pos="-1.705,-1.033"]  Match [pos="-2.111,-0.869"]  Opposition [pos="-1.912,-0.691"]  Team [pos="-1.929,-1.034"]  Toss\_outcome [pos="-1.921,-0.868"]  Batting -> Bowling\_Type  Batting <-> Innings  Bowling\_Type -> Extras  Extras -> "Win/Lose"  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Extras  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of maiden overs from spin bowling on winning? | Total Effect |  |  |  |  | dag {  "Win/Lose" [outcome,pos="-1.426,-0.792"]  Batting [adjusted,pos="-1.703,-0.867"]  Bowling\_Type [exposure,pos="-1.697,-0.690"]  Dot\_Balls [pos="-1.571,-0.789"]  Innings [adjusted,pos="-1.705,-1.033"]  Match [adjusted,pos="-2.111,-0.869"]  Opposition [adjusted,pos="-1.912,-0.691"]  Team [adjusted,pos="-1.929,-1.034"]  Toss\_outcome [adjusted,pos="-1.921,-0.868"]  Batting -> Bowling\_Type  Batting -> Dot\_Balls  Batting <-> Innings  Bowling\_Type -> Dot\_Balls  Dot\_Balls -> "Win/Lose"  Match -> Opposition  Match -> Team  Opposition -> Bowling\_Type  Opposition -> Dot\_Balls  Opposition -> Toss\_outcome  Team -> Batting  Team -> Toss\_outcome  Toss\_outcome -> Batting  } |
| What is the effect of maiden overs from seam bowling on winning? | Total Effect |  |  |  |  |  |
| What is the effect of bowling in the first innings compared to the second innings on maiden overs? | Total Effect |  |  |  |  |  |
| What is the effect of bowling in the first innings compared to the second innings on extras? | Total Effect |  |  |  |  |  |
| What is the effect of fielding wickets on winning? | Total Effect |  |  |  |  |  |
| What is the effect of bowling spin or seam on 1s scored? (i.e are 1s scored more often off seam or spin bowling) | Total Effect |  |  |  |  |  |
| Does bowling in the first or second innings have an effect on 1s scored from spin or seam bowling? | Mediated Effect |  |  |  |  |  |
| What is the effect of bowling spin or seam on 2s scored? (i.e are 2s scored more often off seam or spin bowling) | Total Effect |  |  |  |  |  |
| Does bowling in the first or second innings have an effect on 2s scored from spin or seam bowling? | Mediated Effect |  |  |  |  |  |
| What is the effect of bowling spin or seam on 4s scored? (i.e are 4s scored more often off seam or spin bowling) | Total Effect |  |  |  |  |  |
| Does bowling in the first or second innings have an effect on 4s scored from spin or seam bowling? | Mediated Effect |  |  |  |  |  |
| What is the effect of bowling spin or seam on 6s scored? (i.e are 6s scored more often off seam or spin bowling) | Total Effect |  |  |  |  |  |
| Does bowling in the first or second innings have an effect on 6s scored from spin or seam bowling? | Mediated Effect |  |  |  |  |  |