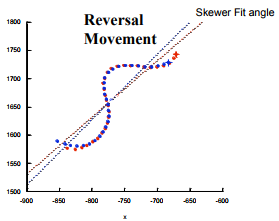
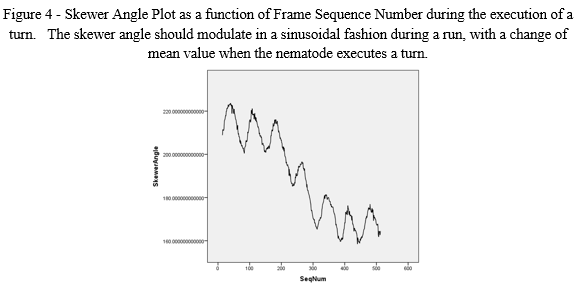
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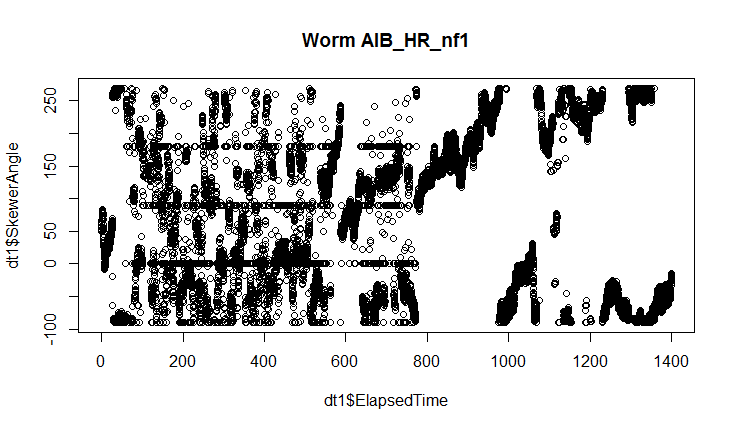
**Comparison of worm RIM\_nf with AIB\_nf, N2-nf**

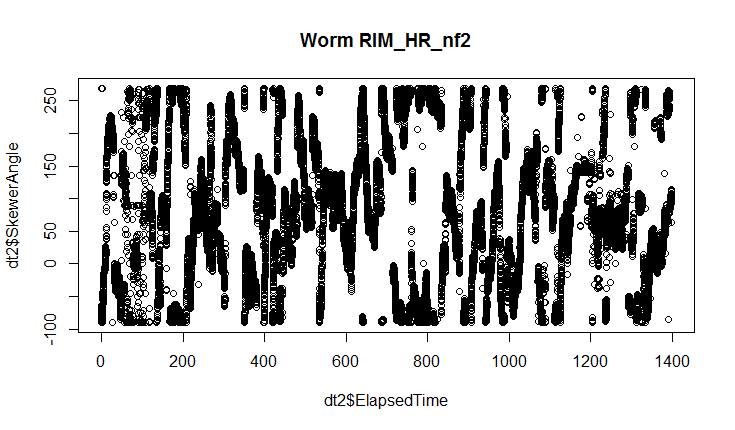
PART 1 Understanding the relationship between important variables and Kim’s movement label

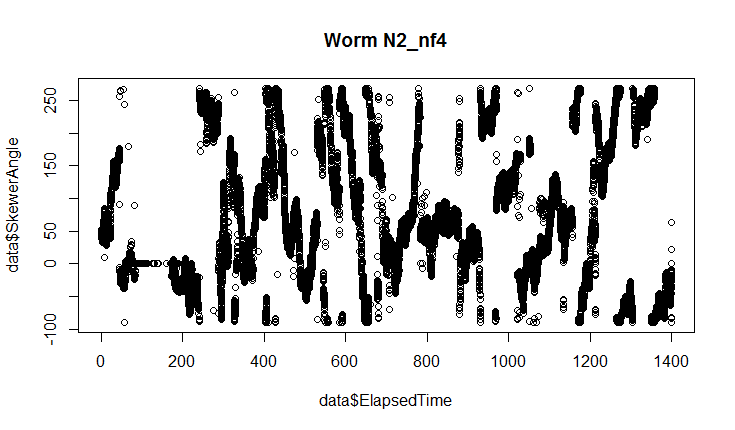
* **Variable SkewerAngle**

Variable SkewerAngle, high variance in certain frames is correlated with the movement ‘Turn’, which means ‘Forward-Sharp’ in our definition, and low variance could be ‘Forward’, ‘Backward’, ‘Stop’.









**Part 2: Data Source:**

**Data used:**

RIM\_nf: 6 videos (RIM\_HR\_nf2, RIM\_HR\_nf3, RIM\_HR\_nf4, RIM\_HR\_nf5, RIM\_HR\_nf6, RIM\_HR\_nf7)

AIB\_nf: 3 videos (AIB\_nf2, AIB\_nf3, AIB\_nf5)

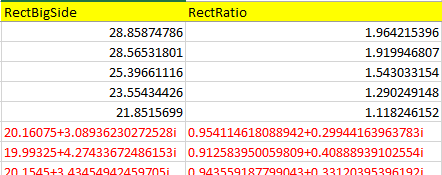
N2-nf: 29 videos(N2\_nf1 N2\_nf10 N2\_nf11 N2\_nf12 N2\_nf13 N2\_nf14 N2\_nf15 N2\_nf16 N2\_nf17 N2\_nf18 N2\_nf2 N2\_nf20 N2\_nf21 N2\_nf23 N2\_nf24 N2\_nf25 N2\_nf27 N2\_nf28 N2\_nf3 N2\_nf30 N2\_nf32 N2\_nf33 N2\_nf4 N2\_nf5 N2\_nf6 N2\_nf8 N2\_nf9 N2\_HR\_nf1 N2\_HR\_nf2)

**Variables used:**

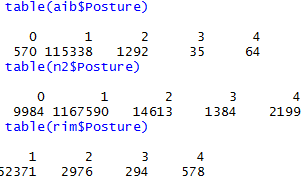
"Area","ComptFactor","Hydraulic","SkewerAngle","Length","CurvHead","CurvTail", “MaxWidth”,”Ixy”, 9 in total, out of 50 variabels, source from the ‘’ContourAndSkel.csv”.

**Questions about data:**

1. Variable RectBigSide, RectRatio: character ‘i’ appearing among numeric



1. Variable Posture in AIB\_nf and N2\_nf: extra state 0 appearing



**Part 3: Findings**

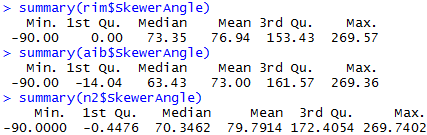
**Difference among the three type of worms:**

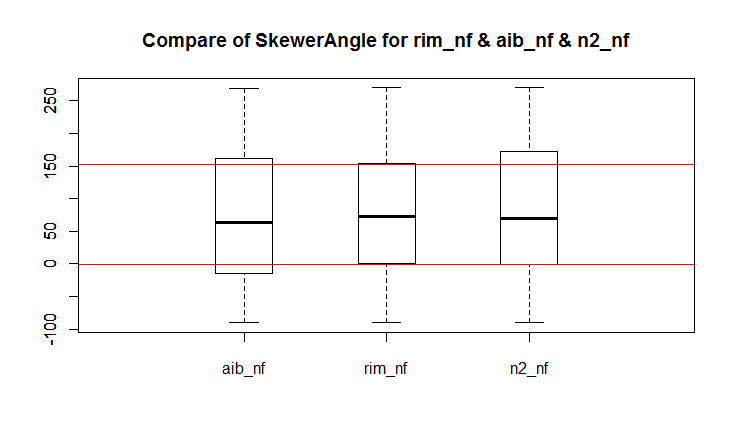
1. RIM has smaller IQR range for variabels SkewerAngle, ComptFacor than the other two types, which means that the data are very consistent (more than 50% values lie close to each other).

In the case of AIB and N2, dispersion of variable ComptFactor grows on lower values (the distance between lower marker and lower box are larger than their corresponding equivalent). In simple words that means that should the deal not happen on average time, it will probably take much more.

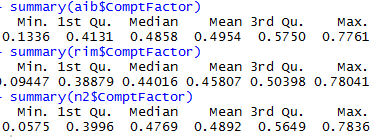
* **Variable SkewerAngle**

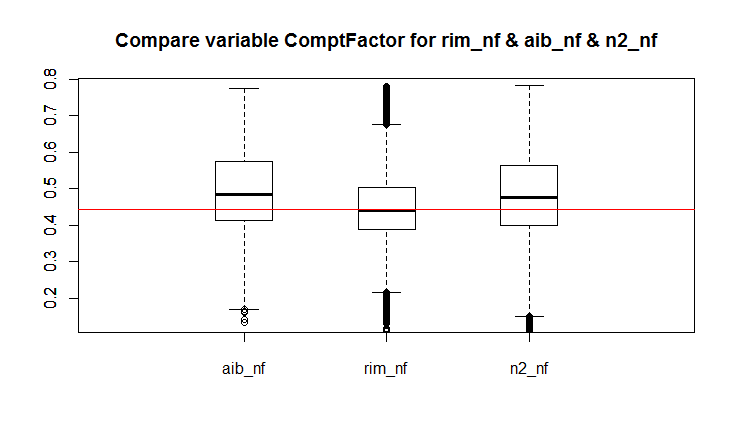
**Five number summary of SkewerAngle**

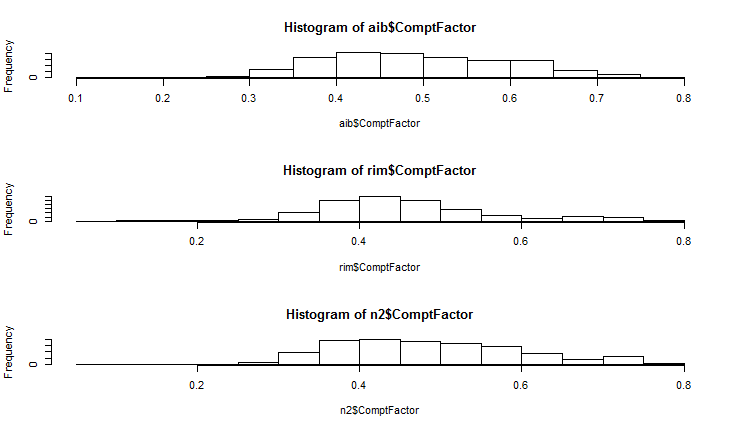


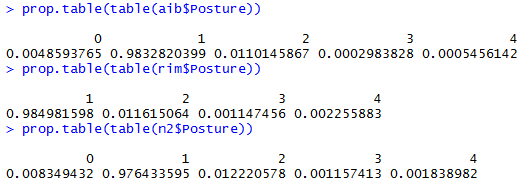


* **Variable ComptFactor**



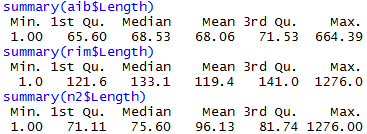


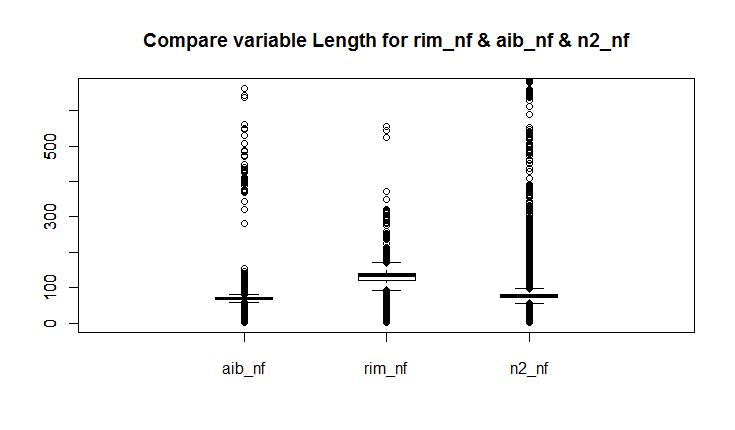




1. RIM has relatively higher value in Length compared to the other two types.

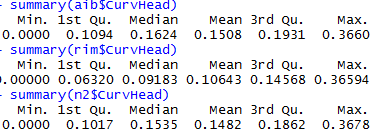
* **Variable Length**

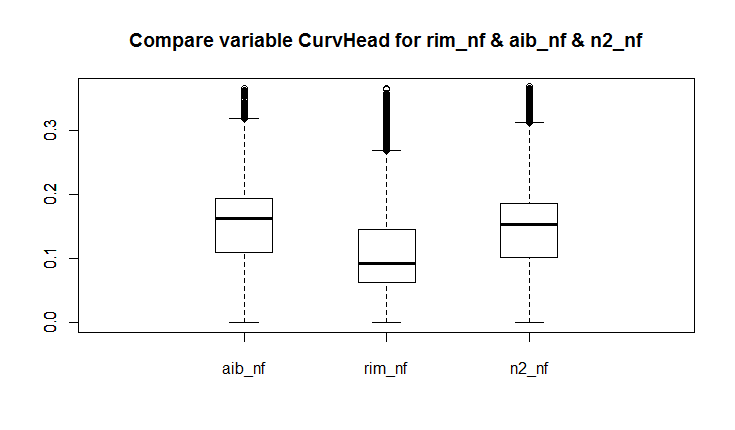


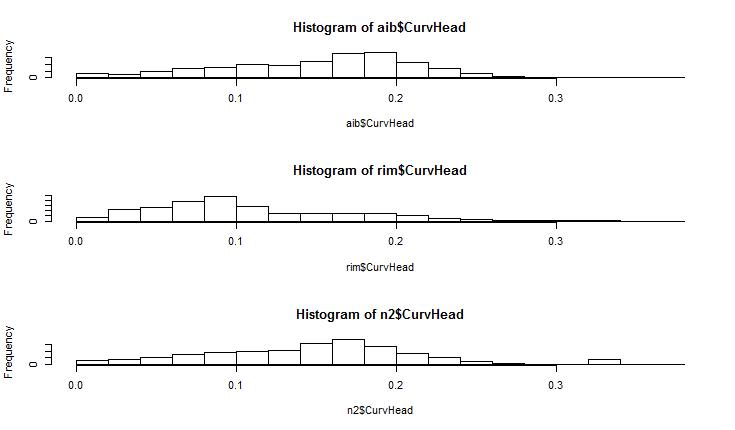


1. RIM has negatively skewed distribution for variables CurvHead, CurvTail , while n2 and aib are positively skewed.

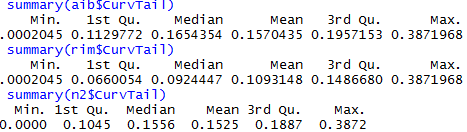
* **Variable CurvHead**

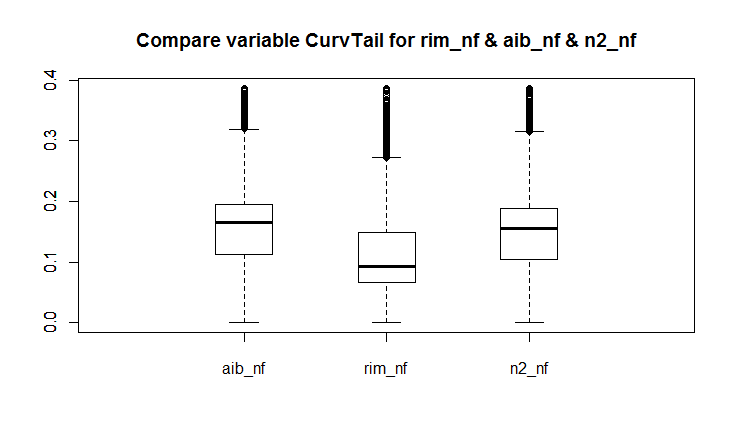


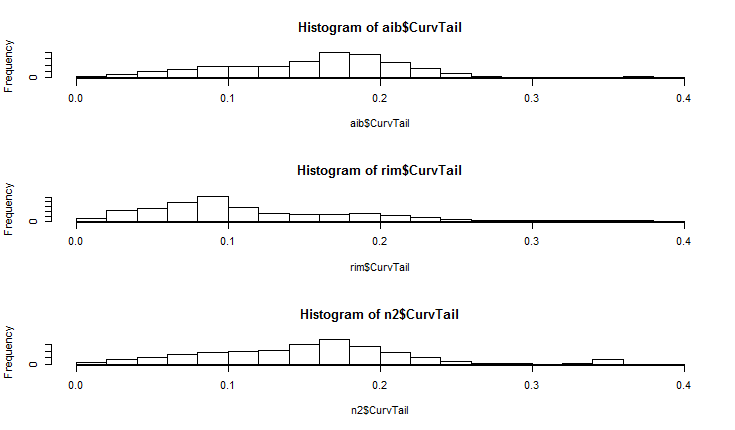




* **Variable CurvTail**

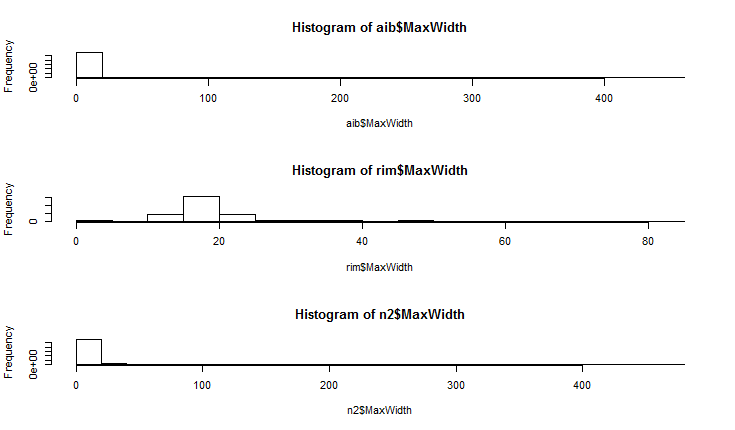




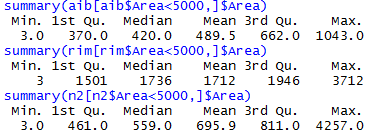


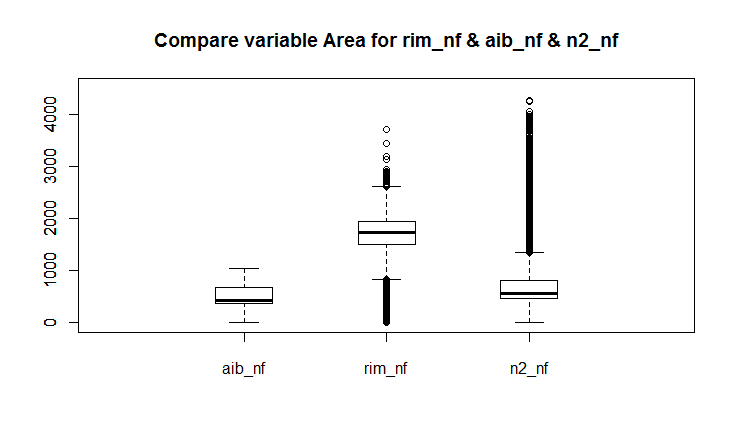
1. RIM has nearly normal distribution for variable MaxWidth , Area, Hydraulic and Ixy, while the other two are not.

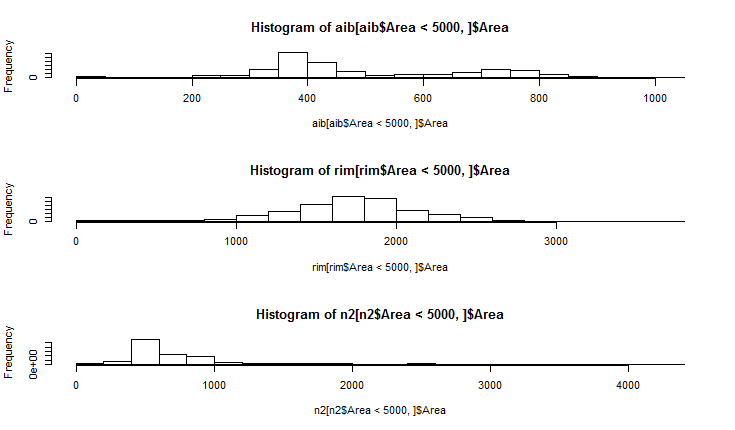
* **Variable MaxWidth**



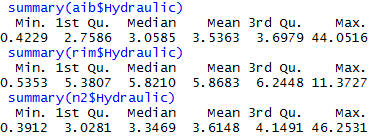
* **Variable Area**

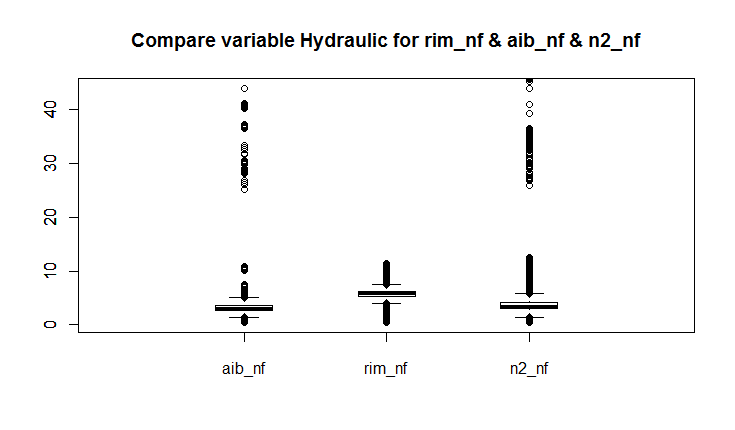


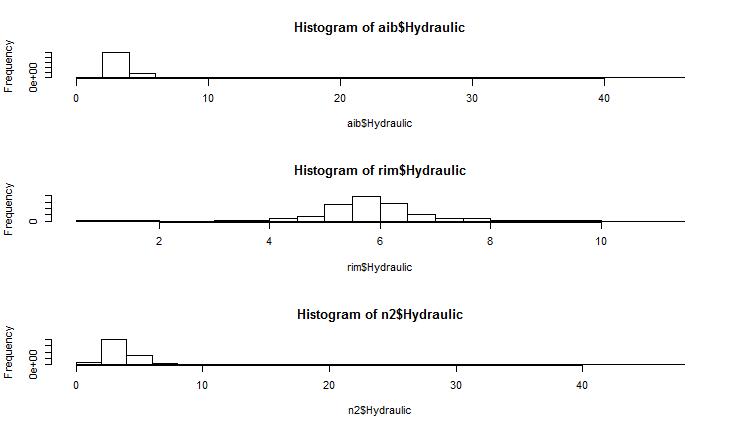




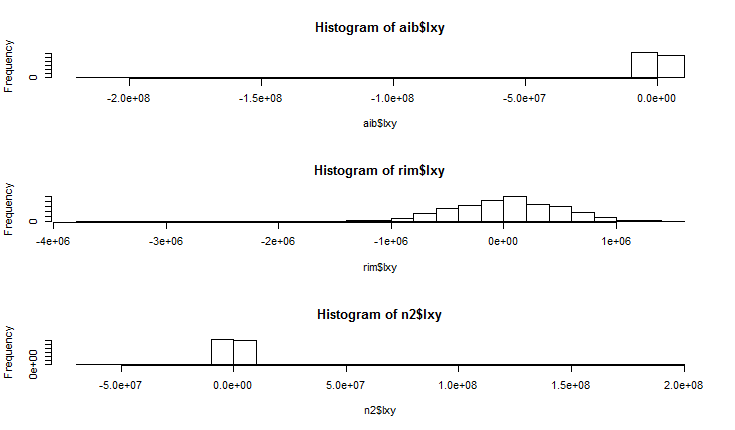
* **Variable Hydraulic**





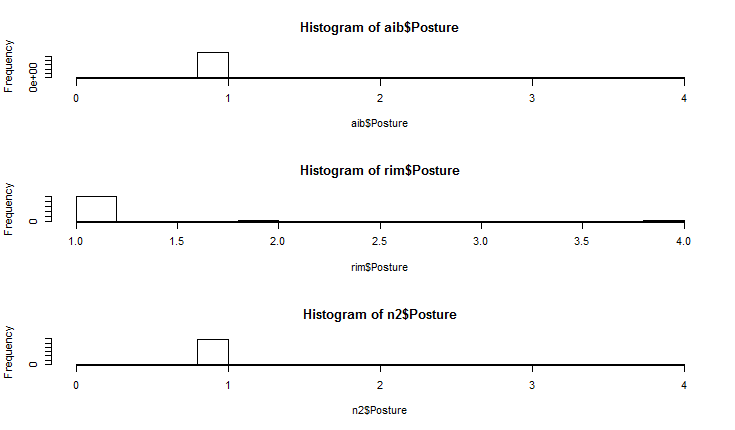


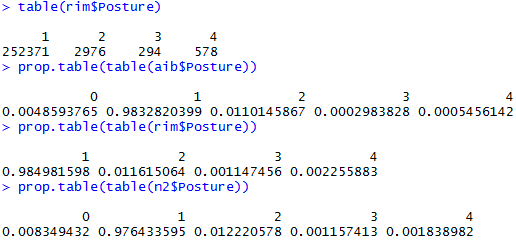
* **Variable Ixy**



**Similarities among the three type of worms:**

1. RIM, AIB, N2 has same majority Posture state, with Posture=1, Non-Loop Posture. At the same time, RIM show relatively more in Posture state 2&4, which is – Delta Loop Posture &Omega Loop Posture.





1. AIB\_nf and N2\_nf have similar distribution in all of the variables except variable Area.