HW6

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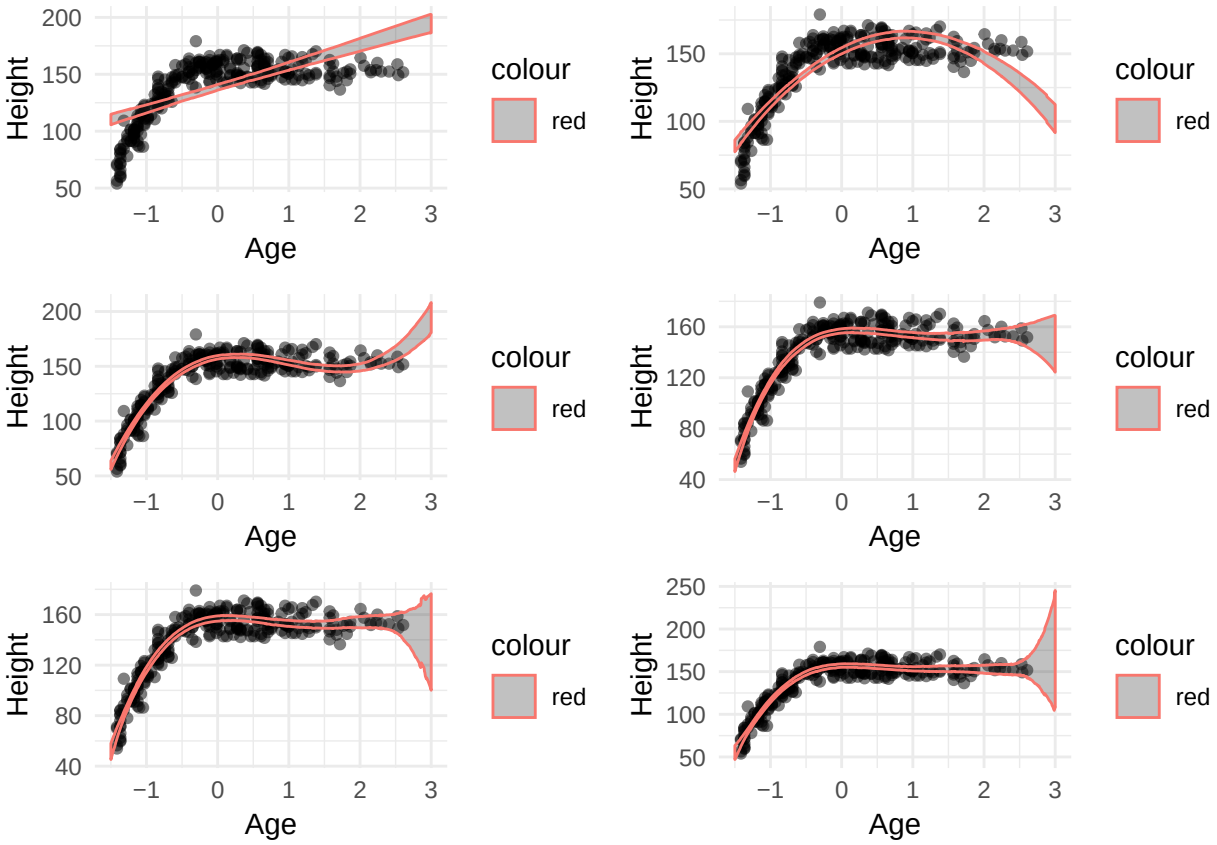
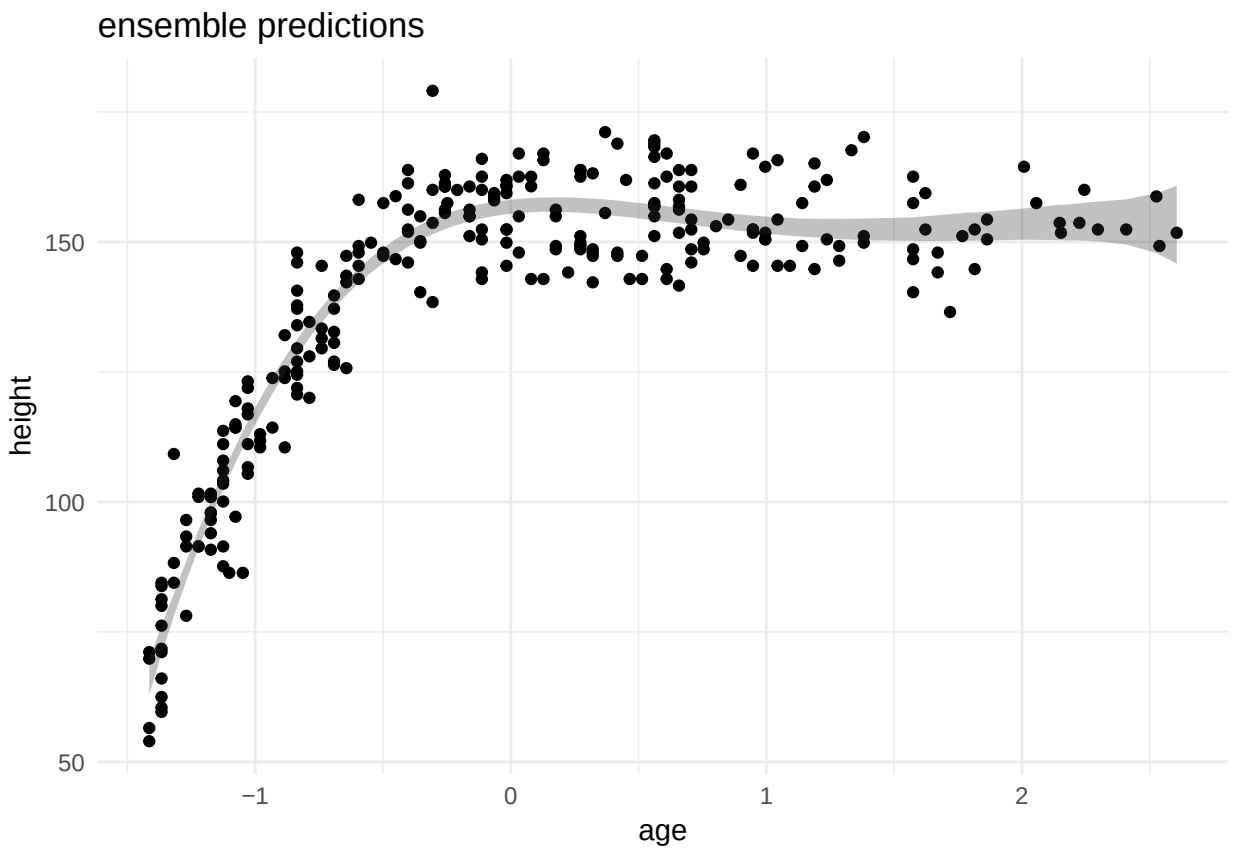
6H2



6H3



7H1

model with dummies for beds a and b

	Mean	StdDev	5.5%	94.5%
a	143.975854	12.776178	123.55705	164.39465
bW	75.161821	9.201878	60.45544	89.86820
bS	-41.251607	9.200743	-55.95617	-26.54704
bWS	-52.197971	11.245568	-70.17056	-34.22538
bBa	-46.077909	18.057025	-74.93652	-17.21930
bBb	-1.322905	18.047089	-30.16564	27.51983
sigma	39.199633	5.342454	30.66136	47.73791

7H2

model without dummies for beds a and b

	WAIC	pWAIC	dWAIC	weight	SE	dSE
mod.bed	295.272	10.001	0.000	0.699	10.079	NA
mod.nobed	296.957	7.065	1.686	0.301	10.463	7.769

	Mean	StdDev	5.5%	94.5%
a	128.053	8.675	114.188	141.918
bW	74.946	10.603	58.001	91.892
bS	-41.133	10.601	-58.076	-24.191
bWS	-51.834	12.949	-72.529	-31.138
sigma	45.229	6.155	35.392	55.065

The WAIC values of the two models are about equal, which suggests that they predict equally well out of sample. However, it is interesting that the WAIC values are similar while the coefficient on the bed b dummy is significant, because I would expect that the significance of that dummy would mean that we would want to include the dummy and get better predictions in doing so. This is a little bit concerning, and I am curious to know more of why this is the case.

7H3

a

with Seychelles

	Mean	StdDev	5.5%	94.5%
a	9.183	0.136	8.965	9.401
bR	-0.184	0.076	-0.305	-0.063
bA	-1.846	0.218	-2.195	-1.497
bAR	0.348	0.128	0.144	0.552
sigma	0.933	0.051	0.852	1.014

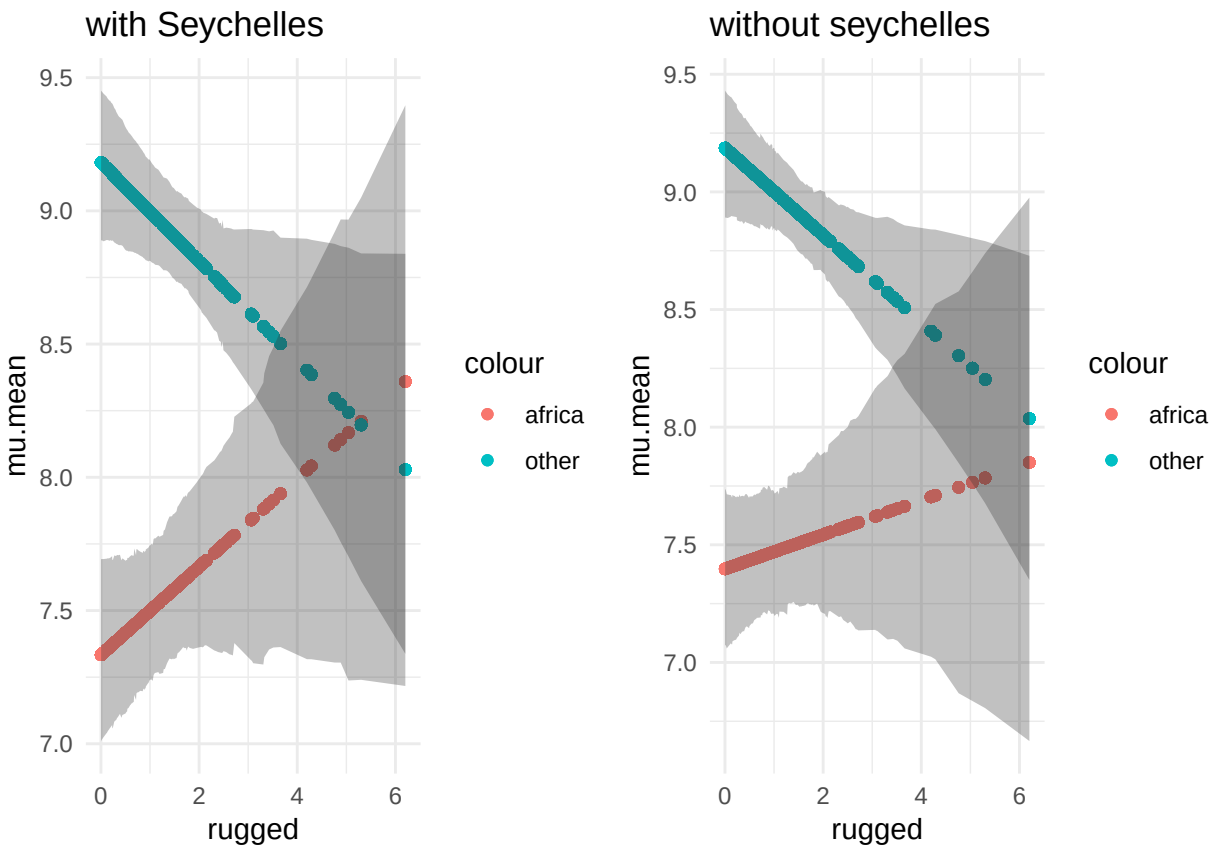
without Seychelles

	Mean	StdDev	5.5%	94.5%
a	9.186	0.135	8.970	9.403
bR	-0.186	0.075	-0.306	-0.066
bA	-1.784	0.219	-2.134	-1.434
bAR	0.252	0.135	0.036	0.469
sigma	0.926	0.050	0.845	1.006

	WAIC	pWAIC	dWAIC	weight	SE	dSE
mod.wo.seychelles	463.224	4.517	0.000	0.961	14.967	NA
mod.w.seychelles	469.643	5.296	6.419	0.039	15.124	10.005

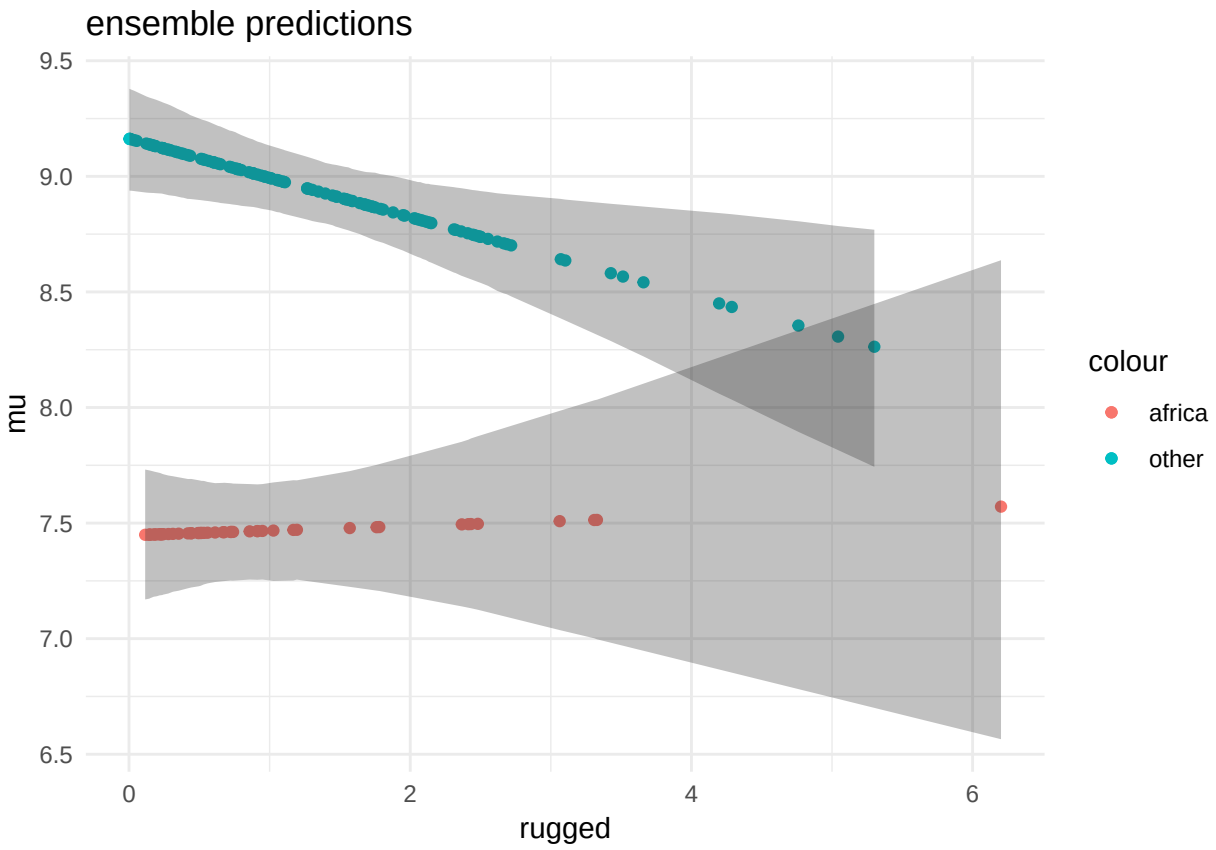
After fitting the interaction models, it does seem like the ruggedness depends on contininent because the interaction term between the two is highly statistically significant in both models. However, it is interesting that the interaction term changed by so much after removing the Seychelles, which suggests that it is pulling our results. The WAIC values of the two models are also virtually identical, which means that the two models have just about equally good out of sample performance.

b



In both plots, it seems like the effect of ruggedness depends on continent (i.e. excluding the Seychelles does not have that big of an impact on the overall trends). The expected relationship has changed a little bit when we exclude the Seychelles. The model with the Seychelles has a steeper slope than the one without the Seychelles, but both are still upward-sloping.

c



This plot of the model averaged predictions looks pretty similar to the previous plots without model averaging, which suggests that the inferences do not change all that much from the previous question to this one. Overall, the slopes of the lines look more or less the same and the differencei in the intercepts seems significant, as well, which is what we expected based on our previous models.