Question 7

Not complete

Marked out of 6.00

Copulae

Suppose that we observe a sample $\boldsymbol{X}_i \in \mathbb{R}^2$ for $i = 1, \ldots, 20$. The sample (with observations in rows) can be constructed by the following R code:

```
X <- matrix(c(1.35, -0.53, 0.73, 7.72, 1.86, 0.19, 0.54, 2.07, 0.92, 1.76, 1.18, -0.65, 1.9, 0.17, 1.58, 0.23, 0.5, 0.96, 1.97, 1.79, 2.06, 1.17, 0.93, -3.41, 0.96, -1.02, 0.84, 1, 0.63, -1.42, 1.96, -2.15, 1.23, 5.11, 0.15, 2.18, 1.2, -1.8, 0.56, 0.04), 20, 2, byrow=TRUE)
```

If you wish to convert them to a data frame and/or save them to a file, the following code might be helpful:

```
write.csv(as.data.frame(X), "X.csv", row.names=FALSE)
```

(a)

Fit a Gaussian copula with empirical margins to these data. Store the estimated correlation of the Gaussian copula in `ans_a_r`.

(b)

Fit a Gaussian copula with gamma and normal margins (in this order) to these data. Store the estimated correlation of the Gaussian copula in `ans_b_r`, the estimated mean of the normal margin in `ans_b_mean`, its estimated standard deviation in `ans_b_sd`, the estimated shape parameter of the gamma margin in `ans_b_shape`, and the estimated rate parameter in `ans_b_rate`.

Answer: (penalty regime: 0 %)

Reset answer

```
1 X <- matrix(c(1.35, -0.53, 0.73, 7.72, 1.86, 0.19, 0.54, 2.07, 0.9
2
3 ans_a_r <-
4
5 ans_b_r <-
6 ans_b_mean <-
7 ans_b_sd <-
8 ans_b_shape <-
9 ans_b_rate <-
```

Precheck

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