COP 3502 Spring 2017 Use of Old Programs and Quizzes

In this course, I used 5 old programs and gave two quizzes on them. In theory, if students really did their own work on the programs, they'll naturally do well on the quizzes on those programs. A student who cheated on the programs would have high program grades, but a low quiz grade on the corresponding quiz to those programs.

In particular, I had programs 1, 2 and 3 map to quiz 1, and programs 4 and 6 map to quiz 2.

The correlation coefficient between the sum of program grades 1, 2 and 3 to the grade for quiz 1 was .373.

The correlation coefficient between the sum of program grades 4 and 6 to the grade for quiz 2 was .426.

So, these numbers indicate that most of the class doesn't cheat significantly and that those who get good program grades also get good quiz grades.

Now, let's see what we can find in terms of outliers.

I flagged students who earned at least 100 out of 120 on programs 1,2 and 3, but lower than 25 out of 40 on quiz 1. There were 14 students out of 200 - so only about 7% who might have really cheated effectively. Of these, I know a few of the students personally and am fairly certain that at least 3 of them did not actually cheat on their assignments. This means, that my indirect measurement likely has some false positives. Namely, there are other ways that students can get high program grades and low quiz grades.

I flagged students who earned at least 70 out of 80 on programs 4 and 6, but lower than 25 out of 40 on quiz 2. There were 25 students out of 200 - so maybe up to 12% who cheated effectively. I also cross referenced these with the first list. Of the 14 students on the first list who were flagged for doing well on programs 1, 2 and 3 but poorly on quiz 1, 8 students showed up on both lists. I would say that there's a higher probability that these 8 students cheated on their programs. Four of the eight have such low quiz scores that it's almost certain that those four cheated on their programs or got so much assistance it was equivalent to cheating. Furthermore, in analyzing the grades from the _**two new programs**_ that I gave for these eight students, what I found was that three of them (which are part of the four I previously mentioned) scored either 0 or near 0 on the new programs. So, I would say that for these three flagged students, the chance they cheated on their programs by getting old solutions is extremely high, at least 90% or higher. For two of the students, it's likely that they passed the course due to their cheating; two of the students were within 2% of my passing line. With the old programs worth 10% of the total course grade, it's likely that these students would lose 5% (50% of my points are roughly for free on programs) of their course grade had they not cheated. The third student still would have passed the course with the exact same grade if he/she didn't cheat.

Unfortunately, one thing I couldn't help but noting is that **all three** students are of Indian descent when there are fewer than 10% Indian students in the class. This goes along with the stereotype that Indian students cheat at higher rates than the general populace.

Another unfortunate thing I noticed was that of the 8 students flagged on both quizzes, 6 were female. Of course, these numbers are small enough that the result could simply be anomalous. But again, if I have fewer than 20% females in the course and 75% of the students flagged for likely getting extra assistance on their programs are female, by straight probability, this result is extremely unlikely. I do think there's something going on here and here's my interpretation: females care more about grades and are more diligent than males (relatively well-documented). I think many of the females that were flagged genuinely worked on their programs (I know most of them), but also got significant help; the type of help that I probably wouldn't call cheating and the type of help where they definitively didn't think that they were cheating. Nonetheless, they were persistent enough to get their assignments done and took lots of time and perhaps constructive assistance to do so. But, they got enough assistance that they probably didn't conceptually understand everything going on, but only understood what their program was doing for that one specific example. (My quizzes asked lateral questions that tested concepts tested in the programs instead of asking precisely about the program solution.)

At the end of the day, I believe I have strong proof that three students cheated on their programs effectively out of 200, and that of those, two students received grades that they didn't deserve. On the whole, I think I am reasonably happy that this only amounts to 1% of students, far less than the 30% who their peers perceive are cheating. (Of course, I strongly believe a higher percentage actually cheat, but not effectively.)

Program-Exam Correlation
I also ran the correlation coefficient between students' program grades and their exam grades. It was a whopping .64. So, doing well on your programs correlates very, very strongly to your exam performance in the course!