

## Digit Loses a Friend

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I live in a small apartment on Chicago's near north side. It's in an old style red brick and stone building with a big front porch. It started out as a 3-flat apartment building with a shared basement. Each of the three apartments had a separate living and dining room, a kitchen, three full bedrooms, and a storage room in the basement. The first floor apartment had a stairway down to the main part of the basement in the front of the building. About ten years ago, I'm told, the city leveled a whole neighborhood to build a university. Real estate investors converted each of these old 3-flats into a 7-unit apartment building: two on each floor and a "garden apartment" where the main part of the basement used to be. Increased demand on housing from the students, faculty and staff pushed each small apartment's rent up to what all three floors used to bring in! These apartments are quiet, clean and have all new wiring, plumbing, and appliances. It's just my dad and me, now, and I've got my own room.

My high school is about two miles from home and Dad says kids should walk when the weather is nice. (He'll drive me if it's raining, snowing, or too cold outside.) A lot of my neighborhood friends attend the same school as I do and we walk together whenever we can. We have this unspoken agreement: when one sees another they join up. And when you get to the big tree, you wait there for stragglers until exactly 7:28 am, when the downtown commuter train roars by. That leaves you plenty of time to get to your first class.

The "big tree" is a huge oak tree at the end of a grassy median on an isolated, block-long street, about a half mile from school. The street begins as a tee off a big street and ends at the C&NW train tracks. There are huge old houses on either side of this short, split street. When the weather is nice kids play in the median and people sit on their front porches in the evening; and everyone seems to know everyone else. It's got a pleasant, small town atmosphere that's hidden away in this big city. When I get older, I'd really like to live there.

I am about two blocks from home when Johnny yells "Hi, Digit," from across the street. "Did you get that last Math homework problem?" Johnny is in my 9 am Math class and we should have

enough time to work it out together. “I think so,” I shout. “I got an answer, but I’m not sure it’s right.” Dad is using my computer for an insurance case that he is working on and I can’t get him off it long enough lately to do my own stuff. “Just a minute – I’ll get it out.”

I start to fumble through my backpack for my homework when I am startled by the sounds of screeching brakes, the thump of a car hitting the curb, and the terrible crack of that car hitting Johnny. His books and papers are strewn everywhere. I stand there frozen, staring across the street in horror and disbelief. My heart is pounding. The car’s windshield is badly smashed and I see Johnny lying very still on the hood, bleeding. Out of the corner of my eye I see two other cars speeding away from the scene and I force myself to look hard at their license plates. The next thing I know I am in the back seat of a police car, telling the officer what I saw. “The first car was an older blue Honda with Illinois license plates CA 16256.”

“That’s pretty specific information, young lady. Are you sure?”

“Yes, I’m sure: 256 is 16 squared, so it’s easy to remember. The other car was a dark brown Impala, Illinois license 144 GRS.” I say that with confidence, and I’m almost sorry when he doesn’t question it. He finishes up some paperwork and drives me the rest of the way to school, where I’ll relive the whole story again in the Principal’s Office and wait for Dad to come get me.

I doubt there is any place lonelier or drearier than a school hallway when the students are in class. Between classes everyone is talking to everyone else and hurrying to get to their next room. Add in the bells and locker noises, and it’s nearly deafening. But when the hallway is empty, as it is now, you can smell that stuff the janitors put on the floor when they swept up last night, and you can see the swirls from their big electric buffers. Once each minute the hallway clocks all double-tick in unison, and I wonder what’s keeping Dad.

I stand up when I see him burst through the double doors. “Dad,” I start, but stop to choke back the sobs. “I don’t think Johnny lived through that accident.” He holds me tightly and says “He didn’t, sweetheart,” as gently as anyone can. Dad drives me home and I cry myself to sleep.

Johnny was a close friend and I'll really miss him. I'm staying home the next few days. Dad and I are going to the funeral together.

The wake was filled to capacity with his teachers, friends from school, and their parents. When the Pastor gave his sermon, no one was looking up at him, and he was having trouble keeping his composure. The death of a child is about the worst experience anyone can have. Fewer people attended the funeral. It was a dark gray day, with an October chill in the air and everyone was glad when it ended. I'm told there will be some grief counselors at the school next week; this is going to be hard on a lot of us, for a long time to come.

My real name is Bridgett, but Mr. Paulson, my Math teacher, called me Digit in class once and it stuck. I don't mind it – even Dad calls me Digit sometimes. My dad used to be a Sergeant on the Chicago Police Department, and a good one. He would have made Lieutenant by now, but he left the Force after Mom died. He felt a need to "be there" for me, and didn't want to have such a dangerous job that I worried about losing him, too. The insurance money from her accident was almost enough for us to live on, but he still works as a consultant and private investigator on insurance fraud cases. He says it's just to keep busy, but the extra money doesn't hurt.

Dad gets up early every morning, stops his work long enough to see me off to school, and then continues working until I get home. I make my own breakfast and lunch, help with the laundry, grocery shopping and other chores. He often stays up working long after I go to bed.

Dad and I are very close. He always finds time for me after school, helping me with my History and English homework. "With Math and Science you're on your own," he says. He smiles when he says that, but I really am better at Math than he is. I don't need help in History or English either, but I really enjoy the time we spend together. "Now that Mom's gone, somebody's got to help you learn all this stuff," he says. And when he gets stuck trying to get the computer to do what he wants it to do, we reverse those roles just a little.

I guess I'm kind of a geek. I've always been good at Math and I just assumed everyone else was, too. It really surprised me to find out how many other kids dreaded going to that class. Math

always seemed to be interesting and fun to me, and I always get an A. That's not without some side benefits: almost everyone in the school knows me by name. Well, by my nickname, anyway, and I get so many text messages that Dad got me a pink Sidekick cell phone that opens up into a QWERTY keyboard.

The Computer Club at school meets in the Math room after the last class of the day. It's a typical classroom, with the old chalk boards and heavily varnished wooden seat-desk units bolted to the floor. The last few rows of seats were removed and replaced with two long folding tables, each filled with a double row of computers. Mr. Paulson helps us with the word processing and spreadsheet formulas, and shows us computer programs that solve the kinds of problems we are studying in Math class. Computers are fun to work with, and are as interesting and as challenging as anything I've ever done. I plan to study Computer Science in college because that's the kind of work I want to get into. Mr. Paulson says that's a great idea, and that he is willing to help me get there. He even helped me set up my own web site, at [www.DigitsWebSite.com](http://www.DigitsWebSite.com).

When I get home from school I realize that it's been over a week since the accident, and my life is getting back to normal. I toss my books on the table and look for Dad. At the computer, as I should have guessed. "What's up?"

Our computer is on a small desk in a corner of the living room, next to the kitchenette. All the CDs and manuals fit in the drawer and the computer and monitor leave just enough room for the keyboard and mouse. A small laser printer sits up on the kitchen counter. "I have to examine this new accident report database," he says, "so I might be up pretty late tonight. How was school?"

"We had a guest speaker at the Computer Club meeting. You would have liked his talk! He works with huge databases from grocery store sales, doing *data mining*."

"That does sound interesting. What's data mining?"

“I took notes; just a minute.” I lay some papers and charts on the kitchen table and we both lean over them. Dad shows me a lot of respect. He’s about the coolest father a girl could ever have.

“All this data comes from the checkout registers,” I explain, “which are really small point-of-sale computers connected to a big computer in the office, at the back of the store. The first thing this guy did was to examine each of the data elements for possible relationships to each of the others. When someone buys eggs, for example, do they also buy bacon? Are hot dogs always purchased with buns, and how about soda pop and potato chips?”

After he told the store managers about some of the relationships he found they put the buns by the hot dogs and the purchase correlation between hot dogs and buns got stronger. A customer who buys one item sees the other item next to it and buys them both!” That got a low whistle from Dad.

“To further test the theory,” I continued, “the store put half of the buns back to where they were before, with the other bread products, but gave them a different bar code number. The increased buns sales were proved to be from the coded buns by the hot dogs. Is that cool or what?”

“Okay, smarty, how do you find these correlations?” Dad asked.

“I’ve got all that here in my notes. You start with simple histograms, or bar charts showing the number of purchases of just hot dogs, just buns, and both hot dogs and buns. Each bar in the graph represents the percentage of people who were in one of your categories. If only 5% of the people bought just buns, for example, that bar would be seven units high. If 15% of the people bought only hot dogs, that bar would be 15 units high, and so on.

“Look at this,” I said, pulling out a chart, “On his first chart, 30% of customers bought only hot dogs, 7% bought only buns, and 63% bought both. After they moved the buns next to the hot dogs, he made a second chart: 21% of the customers bought only hot dogs, 7% bought only buns,

and 72% bought both. That means nearly ten percent of those who bought only hot dogs bought buns too, just because they were right there, next to the hot dogs!

The store increased its sales of buns, chips, and bacon by using the results of his data mining analysis, and that got him a bigger contract to dig even deeper into their data.”

“You’re a smart girl and I hope you know how proud I am of you!” I beamed. “I wonder if I can apply these techniques to my work,” he murmured half to himself.

I woke up at 2 am and heard him still typing. I could see him hunched over the keyboard, and the floor next to the desk was littered with charts. “Dad, are you still up?”

“Hi, sweetie. Yes. I’m sorry if I woke you,” he said, “have a look at this.”

Dad exported part of his accident report database to a spreadsheet and ran some correlations, just like we talked about earlier. He built lots of detailed histograms from rear-end collision injury claims data where a car stopped suddenly, causing a rear-end collision with serious injury. He correlated the names of the injured passengers, the times of day, streets, weather, and several other combinations, including the make and model of the damaged cars. One hundred and seventy-one unique make and model cars were involved in his sample of a hundred such accidents. But what he uncovered was that the same five cars seemed to be involved in 31 of them!

“That can’t be a coincidence,” I said. “Are they actually the same cars?” Then I noticed something. “Hey, two of these cars are the same as the ones I saw speeding away from Johnny’s accident!” I wasn’t completely awake, yet and I felt a little dizzy. I reached for Dad’s shoulder and gripped it hard to steady myself. Dad said, “We’re going to find out,” as he picked up the telephone.

“Yes,” he said into the phone, “I do know what time it is. This could be really important. Get dressed and I’ll meet you at the Denny’s by the Station house.” He was talking to the detective who was working on Johnny’s accident case, an old friend of his from his days on the Force. I went back to bed after he left.

“Hi Frank,” Dad said when his friend arrived. “What’s up that needs my personal attention at this hour,” Frank asked as he slid into the orange and yellow booth. They flagged the waitress and got some more coffee and a couple of slices of pie. Frank lit a cigarette and started paging through the pile of graphs on the table. Dad handed him the one he showed me, but Frank just stared at it.

Breaking the silence, Dad said, “I am working with a database of rear-end collisions, where one car stops suddenly and the other car hits it from behind. Each bar on this graph represents the number of accidents involving a particular make and model of car. “See here,” he said, pointing at a bar on the graph, “the Chevy Nova represented by this little bar was in only one accident, while the Honda Accord, in the big bar over here, was in fifteen of them. It looks like a pool of only five cars were involved in 31 of these accidents! And the reason I woke you up was that two of these cars match the description that my daughter gave the officer when her schoolmate was killed. She saw them speed away from the scene, and I’m wondering if they were part of a bigger operation. Can you check into it for me? I can’t tell if all these Honda Accords are actually the *same* car with the limited information I’ve got.”

Frank said, after staring at the graph some more, “If I understand you correctly, almost a third of these accidents involved the same five cars. At least it would appear that way from their make and model. Is that right?”

“Yes,” Dad said, glad that Frank was finally catching on, “and I’m wondering if each of these five cars was paired with another car that worked together in a team, because my daughter saw two cars speed away from the scene.”

“Yeah,” Frank agreed, “we call it *swoop and squat*. The squat car pulls in front of a *mark* car, which is to become the target of their insurance scam. As both cars accelerate, after leaving a

traffic light, for example, the swoop car passes them both real fast, swoops in front of the squat car and jams on his brakes. That causes the squat car to stop (or squat), which causes the mark to hit it in the rear. The swoop car beats it out of there, but the squat car stays to claim injury. The ambulance comes and the squat car occupants are all brought to the Emergency Room for a check-up. Soft tissue damage, which is what you get from whiplash, can't be seen on an x-ray, so the examining physician has to take their word for it, based on the carefully worded and rehearsed complaints from the injured parties."

"It's a good scam," Frank continued, "The insurance company will pay the claims because it's cheaper than fighting such a case in court, and they would probably lose anyway. A couple of lawyers and doctors can get together on this, pay the *injured parties* a few hundred dollars each, and split the rest. It's very profitable if you don't get caught. In this case, I think the swoop car hesitated and they both fled together when they saw the scam go bad."

Frank got up and started putting on his jacket. "I'll have somebody compare the license plates in our accident records to see if the five cars match. If they don't match because the plates were stolen, for example, we can track the injured occupants by name. And if all that fails, we can check the doctors who certified their injuries as well as the insurance companies that paid the doctors' fees. You can bet I'll get to the bottom of this," Frank said, "if there is one."

"Nice work! Thanks for the pie and coffee," Frank said with a grin as he left with the charts.

When I got up for school the next morning, it was obvious that Dad hadn't slept, and he smelled of cigarette smoke. "How'd your meeting go," I asked.

"Frank was pretty easily convinced once I explained the charts to him. He told me that he'll look into it first thing this morning."

"That's fantastic," I said. "I sure hope he catches those guys." Johnny was my best friend and I really miss him. Greed demands a terrible price, I thought.

When I came home from school a week or so later, Dad handed me a newspaper that was folded open to an article about how Frank busted a huge insurance fraud ring. “Wow,” I said. “This is fantastic. But I don’t see you mentioned here anywhere.”

“I let him take all the credit,” Dad said. “He worked hard on it, and the insurance company is quite pleased with my part in this. They stand to reclaim a large chunk of money, and my getting most of the insider credit for that doesn’t hurt,” he added with a big grin.

“Okay,” I mock-pleaded, hands on hips, “where’s the reward for my part in all of this?” He reached under the desk and pulled out a new laptop computer. “Oh, Dad,” I shouted. I threw my arms around his neck and hugged him hard.