

Holiday Entertainment 2014

1. Ad libbing is GOOD if it sounds more natural, but make sure that the person following you has a good lead in.
2. The lyrics listed here are NOT the final versions– the singers probably have those already as they have been adjusting things.

1) Viola and Piano as they come in. Dave Z and Ryan. (Might SKIP since will be doing this later as well.)

2) Welcoming Remarks and lead in to next act. Bill G. and Scott.

Bill G: Welcome to our Holiday Entertainment! We did this last year and we're doing it this year!

Scott: By induction, for all years n , we will do Holiday Entertainment in year n .

Bill G: Uh, Induction does not quite work that way.

Scott: Well, at least I can compute, given a year n , if we will have the Holiday Entertainment in year n .

Bill G: Why do you think you can do that?

Scott: Because ANYTHING can be computed!

Bill G: Uh, no, not everything can be computed. The Halting problem is UNDECIDABLE!

Scott: PROVE IT!

Bill G: I WILL!

3) Scooping the Loop Snooper: A proof that the halting problem is undecidable. By Geoffrey Pullman. Recited by... myself!

No perfect procedure for BUG CHECKS will do
No I won't just assert it, I'll prove it to you
I will prove that although you might work tell you drop
You cannot tell if computation will stop

For imagine we have a procedure called P
That for specified input permits you to see
Whether specified source code, with all of its faults,
Defines a routine that eventually halts.

You feed in your program, with suitable data,
And P gets to work, and a little bit later
In finite compute time correctly infers
Whether infinite looping behavior occurs.

If there's no looping, then P prints out Good
That means on this input it halts, as it should.
But if it detects an UNSTOPPABLE loop,
then P reports Bad! and you're in the soup.

Well, the truth is that P cannot possibly be,
Because if you wrote it and gave it to me,
I could use it to set up a logical bind
That would shatter your reason and scramble your mind.

Here's the trick that I'll use and it's simple to do.
I'll define a procedure, which I will call Q,
That will use P's predictions of halting success
To stir up a terrible logical mess.

For a specified program, say A, one supplies,
The first step of this program called Q I devise
Is to find out from P what's the right thing to say
Of the looping behavior of A run on A.

If the answer is Bad Q will suddenly stop.
But otherwise, Q will go back to the top,
And start off again, looping endlessly back,
Till the universe dies and turns frozen and black.

And this program called Q wouldn't stay on the shelf;
I would ask it to forecast its run on itself.
When it reads its own source code, just what will it do?
What's the loop-ing behavior of Q run on Q?

If P warns of loops then Q has to quit;
Yet P is supposed to speak truly of it!
And if Q's going to quit, then P should say Good!
Which makes Q start to loop!-P denied that it would

No matter how P might perform, Q will SCOOP IT:
Q uses P's output to make P look stupid.
Whatever P says, it cannot predict Q:
P is right when it's wrong, and is false when it's true!

I've created a paradox, neat as can be
And simply by using your pu-t-ative P.
When you posited P you stepped into a snare;
Your assumption has led you right into my lair.

So where can this argument possibly go?
I don't have to tell you; I'm sure that you know.
We now know there cannot possibly be
A procedure that acts like the mythical P.

So you never can find MECHANICAL means
For predicting the acts of computing machines;
It's something that cannot be done. So we users
Must find our OWN bugs. Our computers are losers!

4) Intro to Longest Path. Dave L, Tracy, Bill G.

Scott:

Now I know the halting problem cannot be done
This is an arg-ue-ment that you have won
But what of problems that I care about
They can be solved fast, of that there's no doubt

Tracy: Uh, that's not quite right.

Scott: Oh? Can you do a Dr. Seuss poem about a problem that can't be solved quickly.

Tracy: Better! I can SING about trying to find... THE LONGEST PATH!

Dave L: But we sang that last year.

Bill G: It is a tradition that it be sung every year.

Scott: Tradition! (sung Fiddler-on-the-roof style).

Dave L: Tradition?

Bill and Scott and Tracy: Tradition! (sung Fiddler-on-the-roof style).

Dave L: But this is only the second year! How can it be a tradition?

Scott: Tradition! (sung Fiddler-on-the-roof style).

Bill G: All Traditions(sung) have to start somewhere and this one starts now. Consider it the base case.

Scott: AH-HA! So we CAN use induction!

Dave L: Is it really worth doing two years in a row?

Bill G: Yes, since this year we found someone who can actually sing!

5) Longest Path. Tracy, Backup, Harmonica, Keyboard.

Woh, oh-oh-oh
Find the Longest Path
Woh oh-oh
Find the Longest Path

If you said P is NP tonight
There would still be papers left to write
I have a weakness
I'm addicted to completeness
And I keep searching for the longest Path

The algorithm I would like to see
Is of polynomial degree
But its elusive,
Nobody has found conclusive
Evidence that we can find the Longest Path

I have been hard
Working for so long
I swear its right,
But he marks it wrong
Somehow I'll feel sorry when its done
GPA 2.1,
Is more than I hoped for

Garey, Johnson, Karp and other Men (and Women)
Try to make it Order $n \log n$.
Am I a math fool
If I spend my life in Grad School
Forever following the Longest Path.

Woh oh-oh-oh
Find the longest path
Woh oh-oh-oh
Find the longest path
Woh oh-oh-oh-- Find the longest path

6) Intro to Theory Girl. Dave Z and Tracy.

Dave Z: You sang about Theory!

Tracy: Yes, I am a Theory Girl.

Dave Z: So, . . . , you wouldn't be interested in a Systems Guy?

Tracy: Oh, I don't know. Can you convince me— in song form?

Dave Z: I can sure try to . . . (Lead right into the song, with THEORY GIRL being the first two words.) (Ryan does Bee-box in background)

7) Theory Girl. Sung by Dave Z. Keyboard, Harmonica.

Theory Girl

Working in an academic world
I bet she never had a systems guy
Bet her advisor never told her why
I'm gonna try for a

Theory Girl

She doesn't want to code in C or Perl
She never touches keyboard, mouse or screen
Because she uses an abstract machine
It's nice and clean

And when she quotes
al-to-rithms from me-mo-ry
You'll find she knows
All of Knuth volumes one-two-three

Why is the math so tough
How can I
Prove my love for a

Theory Girl

I'll never catch her reading Infoworld
She doesn't care about the marketplace
Just polytime and log-a-rithmic space
In any base

Theory Girl

I'm not the richest hacker in the world
But when I sell my startup company
I'll tell her that she means the world to me
Then Q E D

And when she shows me
Her TH-EOREMS so FI-I-INE
And whispers (TRACY DOES THIS NEXT LINE) THREE point one
FOUR one five NI-I-NE

I'll wave my hands and bluff
That should be proof enough for my

Theory girl
She's me theory girl
Don't you know I'm in love with a
Theory Girl
She's my theory girl
With a Theory girl
She's my theory girl

With you theory girl

8) Intro to Dave Z and Ryan Music. Dave L, Bill G, Dave Z, Ryan

Dave L: You did indeed find people who could sing! Are there any other hidden talents out there?

Bill G: The song *Theory Girl* was written and performed by a group that contained our own Neal Spring.

Dave L: Isn't that plagiarisim?

Bill G: Not if you reference it. Or is that de-reference it? I always get those two confused.

Dave L: Are there any more hidden talents out there?

Bill G: Well... Bill Pugh can eat fire. Our singer Tracy can also eat fire, but we didn't want her to do that since she's the ONLY one of us who can sing.

Dave Z: I resent that remark!

Bill G: Do you disagree?

Dave Z: No but I resent it.

Dave L: Are there any more hidden talents out there?

Bill G: Bill Pugh can eat fire. Our singer Tracy—

Dave L: Break out of the infinite loop and answer the question.

Scott: AH-HA, so you can detect infinite loops! HALT is DECIDABLE!

Bill G: Only in some cases. NOW to break out of it: We found a Piano Player and a Viola Player!

Dave Z and Ryan D: That's us!
(THEY PLAY)

10) An ugrad, a grad, a postdoc, and a prof walk into a bar.

(DAVID Z) Narrator: Two undergraduate computer science majors walk into a bar. The first one wants a beer and says:

(RYAN) Undergrad 1: Id like a beer

(DAVID Z) Narrator: The second undergraduate also wants a beer, so she says:

(TRACY) Undergrad 2: Make that ten.

(DAVID Z) Narrator: A computer science graduate student walks into a bar and says:

(DAVID L) Grad Student: I want to drink a large number of beers as efficiently as possible

(KIRS) Bartender: Ah, then have a seat here at the hash table.

(DAVID Z) Narrator: Several beers later

(DAVID L) Grad Student: (drunkenly bopping himself in the forehead with a beer bottle) Oh wow! A collision!

(KRIS) Bartender: (To the Narrator) You want to know what happened yesterday?

(DAVID Z) Narrator: Sure, what happened yesterday?

(KRIS) Bartender: An SQL query walked into the bar, approached two tables and said

(SCOTT) SQL Query: May I join you?

(DAVID Z) Narrator: Two strings walked into a bar

(TRACY) String 1: Id like a beer,
please k%mm#bne3 gkln2 gmmeg\n* ^rWm#2

(RYAN) String 2: Youll have to forgive my friend.
She's not null terminated.

(DAVID Z) Narrator: A C++ function walked into a bar

(KRIS) Bartender: (interrupting) He cant come in here anymore!

(DAVID Z) Narrator: Why not?

(KRIS) Bartender: He has constant arguments!

(DAVID Z) Narrator: Finally a professor enters the bar,
and decides to settle things for good.

(BILL G) Professor: (To the Bartender) Id like ten times
as many beers as the previous order.

(KRIS) Bartender: That, sir, is an order of magnitude.

(Exit music)

10) Lecturer Interview Skit. Samir introduces it. Skit itself is performed by Kris, Scott, Dave Z, Dave L, Bill G, Ryan. (Tracy is not in it since she will be changing into her Disney Outfit.)

Samir: (Begins Happy) Hello, I am Samir Khuller, the Chairman of the Computer Science Department. Computer Science is a great major! Many people want to major in it! According to my calculations (takes out abacus) next year we can expect (Switches to worried) 10,000 freshman computer science majors! We'll need to hire new lecturers! How do we pick new lectures? We interview them. What do we ask them? Lets listen in on the interview process.

Kris plays the lecture candidate. He sits opp everyone else. The order of everyone else is Ryan, Scott, Dave L, Dave Z, Bill

RYAN: Where have you taught?

KRIS: At the school of hard knocks.

SCOTT: What have you taught?

KRIS: I've taught them how to avoid their bookie if they owe money and how to find their bookie if they are owed money.

DAVE L: What are your career goals?

KRIS: To get this job.

DAVE Z: If you were to redesign CS 1 from scratch what would be a good language be to use?

KRIS: English.

BILL: What is your view of group projects?

KRIS: They teach an invaluable skill: how to cheat off the smartest person in the group and pass it off as your own work.

RYAN: How comfortable are you working with TAs?

KRIS: If they mow my lawn and get me coffee, I am very comfortable working with them.

SCOTT: Some students are brand new to computing, others have had lots of prior exposure. How to you deal with that?

KRIS: Fail them all and let God sort it out.

DAVE L: How do you get students attention?

KRIS: Fire off a gun to wake them up.

DAVE Z: What if a student contacted you the night before an exam asking for a lot of help- what would you do?

KRIS: That's why I have Caller ID.

BILL: A student says ''why do I have to learn discrete math if all I want to do is program?'' What is your response?

KRIS: Fuck You.

RYAN: What do you like about teaching? What don't you like about teaching?

Like: Seeing a student cry in my office after getting a bad grade.

Dislike: Seeing that same student get a degree and earn twice my salary.

SCOTT: Is there anything you would like to ask us?

KRIS: Do you do random drug tests or are they announced?

DAVE L: Uh, anything else you want to ask?

KRIS: When do I start?

(Lecture candidate leaves the room.)

DAVE Z: Lets hire this guy!

BILL: Why?

RYAN: Well ... we've seen worse.

11) Intro to *TRANSALATION-LET IT GO*. Dave L and Bill G and Dave Z.

Dave L: From tonights entertainment—

Bill G: STOP THERE. You found it entertaining. Great! My job is done!

Dave L: From tonights entertainment (pauses to see if he will be interrupted) one would think that the department just does theory. Halting Problem is recursion theory, Longest Path is NP-completeness, Theory Girl is ... well, I'm not quite sure what I would call that.

Bill G: Our department does practical things to!

Dave L: Like what?

Bill G: Here is someone who works on Natural Language Processing who will explain it to you.

DAVE Z: I work on Natural Language Processing. We write program that takes text in, say, English and translates it to, say, Chinese. We want to break down barrier of communication and make the world a better place to live!

Bill G: (very serious) Do like helping humanity?

DAVE Z: (excited) Yes!

Bill G: Whats that like?

DAVE Z: When it works, its great.

Dave L: Has a project ever ... not worked?

DAVE Z: Well, to test out one of our translators we translated stuff from English to Chinese and then back to English.

Dave L: And you got back exactly what you put in! Great!

DAVE Z: Not quite. We put in the lyrics to LET IT GO from Frozen, and here is what we got:

12) Translation Song
LYRICS WOULD GO HEAR BUT TRACY ALREADY KNOW THEM.
WE HOPE.

13) Who we are. All members of the Cast.

Dave L: Are we done yet?

Bill G: Yes, but the audience doesn't know who we are.

Dave L: After tonights performance do you want them to?

Bill G: There is no such thing as bad publicity. OKAY, Everyone, say your name and one thing about you that is interesting or unusual.

WE DO THAT

Bill G: Thank you, and wait until next year!

Scott: See, I told you it happens every year!

Bill G: Scott, Shut up. (To Audience) Thanks for coming! See you next year!