

“Can I Pass the IT-220 Challenge ?”

The IT-220 Challenge Task

# of years in Thane	# of years in this slum	Name on electoral role		
1 2 3 4 5+	1 2 3 4 5+	Yes No		
<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input type="radio"/>		
Ration card	Card No	dd/mm/yy		
Yes No	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			
Orange Yellow	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			
Voter ID card				
Yes No	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			
Mother tongue	Home	Vehicle		
Marathi <input checked="" type="radio"/>	Kaccha <input type="radio"/>	Own house <input type="radio"/>		
Hindi <input type="radio"/>	Semi-pukka <input checked="" type="radio"/>	Rent <input type="radio"/>		
Kannada <input type="radio"/>	Pakka <input checked="" type="radio"/>	2-Wh <input type="radio"/>		
Other <input type="radio"/>	House <input type="radio"/>	Bike <input type="radio"/>		
Vehicle				
Electricity	Water	Toilet	Disposal	Garbage
Own meter <input checked="" type="radio"/>	Own <input checked="" type="radio"/>	Soak pit <input type="radio"/>	Bin <input type="radio"/>	None <input checked="" type="radio"/>
Borrowed <input type="radio"/>	Public <input type="radio"/>	Septic <input type="radio"/>	Open <input checked="" type="radio"/>	2-Wh <input type="radio"/>
No elec <input type="radio"/>	Other <input type="radio"/>	Sewage <input type="radio"/>	Other <input type="radio"/>	Bike <input type="radio"/>
Comforts				
Cable <input checked="" type="radio"/>	Tels <input type="radio"/>	Last name: <input type="text"/>		
Fan <input type="radio"/>	Mixer <input type="radio"/>	Address: <input type="text"/>		
Fridge <input type="radio"/>	TV <input type="radio"/>			
Newspaper <input type="radio"/>				

input

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1 2 3 4 5+	1 2 3 4 5+	Yes No		
<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input type="radio"/>		
Ration card	Card No	dd/mm/yy		
Yes No	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			
Orange Yellow	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			
Voter ID card				
Yes No	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			
Mother tongue	Home	Vehicle		
Marathi <input checked="" type="radio"/>	Kaccha <input type="radio"/>	Own house <input type="radio"/>		
Hindi <input type="radio"/>	Semi-pukka <input checked="" type="radio"/>	Rent <input type="radio"/>		
Kannada <input type="radio"/>	Pakka <input type="radio"/>	2-Wh <input type="radio"/>		
Other <input type="radio"/>	House <input type="radio"/>	Bike <input type="radio"/>		
Vehicle				
Electricity	Water	Toilet	Disposal	Garbage
Own meter <input checked="" type="radio"/>	Own <input checked="" type="radio"/>	Soak pit <input type="radio"/>	Bin <input type="radio"/>	None <input checked="" type="radio"/>
Borrowed <input type="radio"/>	Public <input type="radio"/>	Septic <input type="radio"/>	Open <input checked="" type="radio"/>	2-Wh <input type="radio"/>
No elec <input type="radio"/>	Other <input type="radio"/>	Sewage <input type="radio"/>	Other <input type="radio"/>	Bike <input type="radio"/>
Comforts				
Cable <input checked="" type="radio"/>	Tels <input type="radio"/>	Last name: <input type="text"/>		
Fan <input type="radio"/>	Mixer <input checked="" type="radio"/>	Address: <input type="text"/>		
Fridge <input type="radio"/>	TV <input type="radio"/>			
Newspaper <input type="radio"/>				

output

The IT-220 Challenge Task

A photograph of a handwritten survey form. The form contains various sections with questions and multiple-choice options. Some answers are marked with black dots. The sections include:

- # of years in Thane: 1, 2, 3, 4, 5+ (marked 1)
- # of years in this slum: 1, 2, 3, 4, 5+ (marked 1)
- Name on electoral role: Yes (marked), No (unmarked)
- Ration card: dd/mm/yy (marked)
- Voter ID card: Yes (marked), No (unmarked)
- Mother tongue: Marathi (marked), Hindi, Kannada, Other (unmarked)
- Electricity: Open meter (marked), Borrowed, No elec (unmarked)
- Conveniences: Callie (marked), Fan, Fridge, Newspaper (unmarked)
- Water: Open Public (marked), Other (unmarked)
- Toilet: Open (marked), Public (unmarked)
- Disposal: Soak pit (marked), Septic, Sewage (unmarked)
- Garbage: Bin (marked), Open, Other (unmarked)
- Vehicle: None (marked), 2-Wheeler (unmarked)
- Household items: Kachha Pakka House (marked), Semi-pukka (unmarked)
- Address: First name: _____, Last name: _____, Address: _____

input

A photograph of a printed survey form. The layout is identical to the handwritten version, with sections for basic information, household items, and address. The printed version includes a grid for marking responses in the first two rows.

# of years in Thane	# of years in this slum	Name on electoral role
1 2 3 4 5+ (marked)	1 2 3 4 5+ (marked)	Yes (marked) No (unmarked)

Ration card	Card No	dd/mm/yy
Yes (marked) No (unmarked)	Orange Yellow (marked) Black (unmarked)	0 1 2 3 4 5+ (marked)

Voter ID card	Card No	dd/mm/yy
Yes (marked) No (unmarked)	Orange Yellow (marked) Black (unmarked)	0 1 2 3 4 5+ (marked)

Mother tongue	Home	Vehicle
Marathi (marked) Hindi Kannada Other (unmarked)	Kachha Pakka House (marked) Semi-pukka (unmarked)	None (marked) 2-Wheeler (unmarked)

Electricity	Water	Toilet	Disposal	Garbage
Open meter (marked) Borrowed No elec (unmarked)	Open (marked) Public (unmarked)	Soak pit (marked) Septic Sewage (unmarked)	Bin (marked) Open Other (unmarked)	None (marked) 2-Wheeler (unmarked)

Conveniences	Cable	Fan	Fridge	Newspaper
Callie (marked) Fan Fridge Newspaper (unmarked)	Tels (marked) Mixer (unmarked)	TV (marked)	TV (unmarked)	TV (unmarked)

Address	First name: _____	Last name: _____	Address: _____
_____	_____	_____	_____

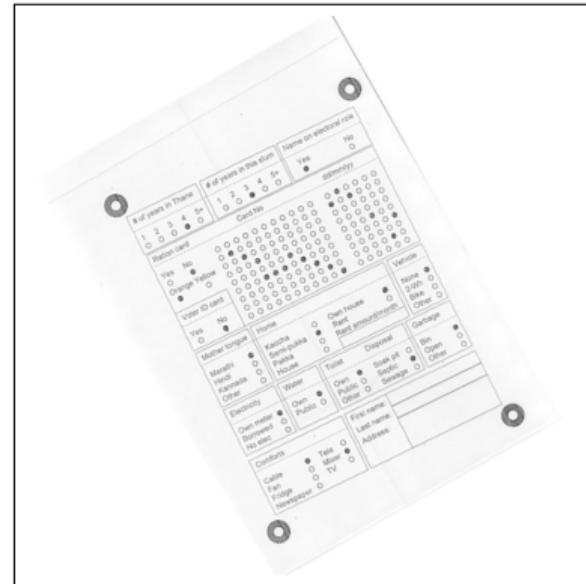
output

The IT-220 Challenge Rules

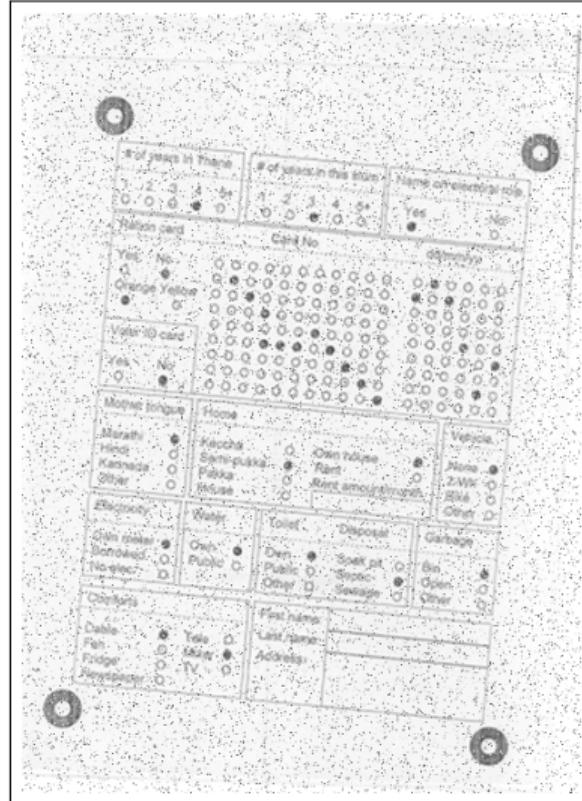
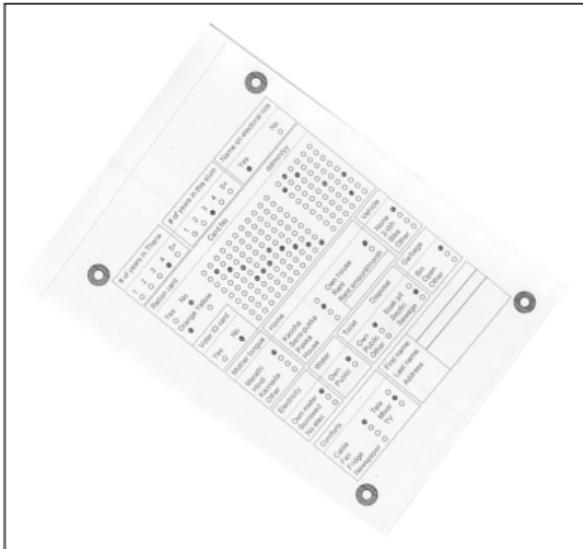
1. No rules! Be creative!
2. C Program (pipeline.c)
→ pipeline <ims> <imd>
3. Comment the program with the pipeline steps

Training Images, data/test-{01, 02}.ppm

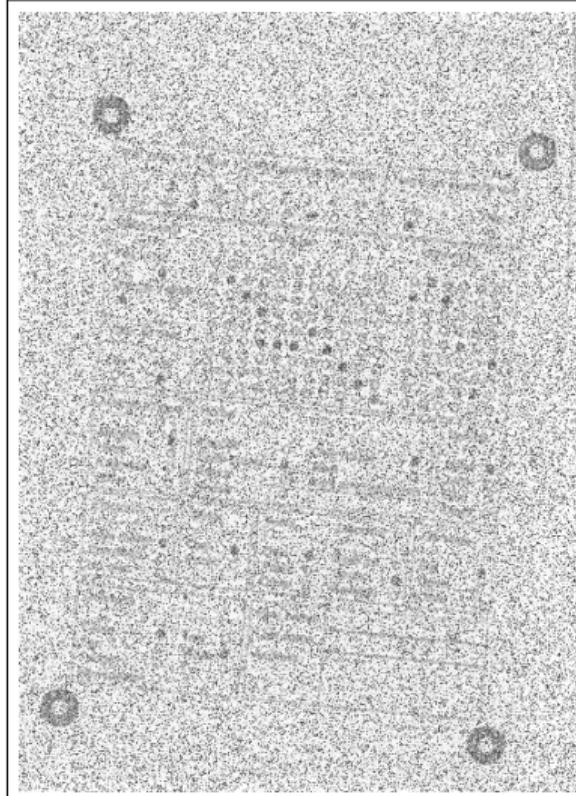
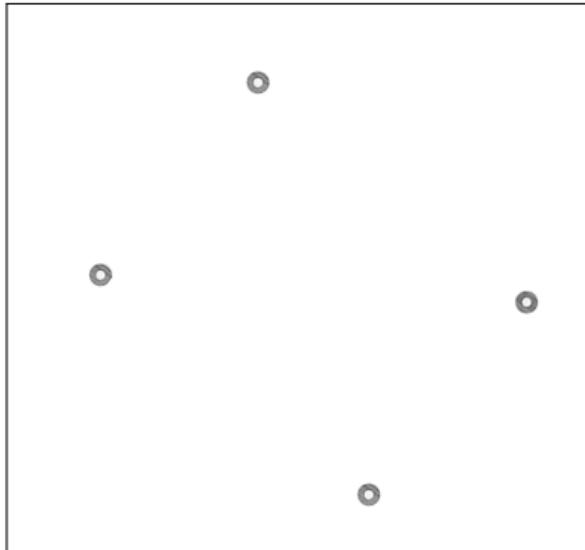
# of years in Thane	# of years in this slum	Name on electoral role		
1 2 3 4 5+	1 2 3 4 5+	Yes No		
<input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input type="radio"/>		
Ration card	Card No.	dd/mm/yy		
Yes No				
<input type="radio"/> <input checked="" type="radio"/>				
Orange Yellow				
Voter ID card				
Yes No				
<input type="radio"/> <input checked="" type="radio"/>				
Mother tongue	Home	Vehicle		
Marathi <input checked="" type="radio"/>	Kaccha <input type="radio"/>	Own house <input checked="" type="radio"/>		
Hindi <input type="radio"/>	Semi-pukka <input checked="" type="radio"/>	Rent <input type="radio"/>		
Kannada <input type="radio"/>	Pakka <input type="radio"/>	None <input checked="" type="radio"/>		
Other <input type="radio"/>	House <input type="radio"/>	2-Wheeler <input type="radio"/>		
Electricity	Water	Toilet	Disposal	Garbage
Own meter <input checked="" type="radio"/>	Own <input checked="" type="radio"/>	Own <input checked="" type="radio"/>	Soak pit <input type="radio"/>	Bin <input type="radio"/>
Borrowed <input type="radio"/>	Public <input type="radio"/>	Public <input type="radio"/>	Septic <input type="radio"/>	Open <input checked="" type="radio"/>
No elec <input type="radio"/>		Other <input type="radio"/>	Sewage <input checked="" type="radio"/>	Other <input type="radio"/>
Comforts				
Cable <input checked="" type="radio"/>	Tele <input type="radio"/>			
Fan <input type="radio"/>	Mixer <input checked="" type="radio"/>			
Fridge <input type="radio"/>	TV <input checked="" type="radio"/>			
Newspaper <input type="radio"/>				
First name:				
Last name:				
Address:				



Test Images, data/test-{03, 04}.ppm



Test Images, data/test-{05, 06}.ppm



Test Images, data/test-{07, 08}.ppm

A grayscale image of a survey form titled "Slum Survey". The form contains various sections with radio button options for responses.

Demographic Information:

# of years in Thane	# of years in this slum	Name on electoral role
1	1	Yes
2	2	No
3	3	
4	4	
5+	5+	

Ration card: Yes No

Voter ID card: Yes No

Mother tongue: Marathi Hindi Kannada Other

Electricity: Own meter Borrowed No elec

Comforts: Cable Fan Fridge Newspaper Tele Mixer TV

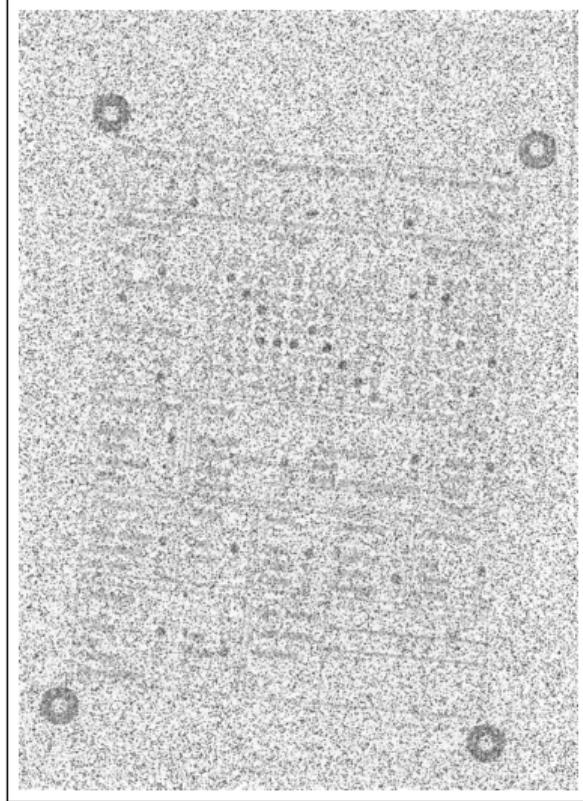
Housing and Living Conditions:

House Type	Occupancy Status	Vehicle
Kaccha	Own house	None <input checked="" type="radio"/>
Semi-pukka	Rent	2-Wheeler <input type="radio"/>
Pakka	Rent amount/month	Bike <input type="radio"/>
House		Other <input type="radio"/>

Utilities:

Service	Source	Disposal	Garbage
Water	Own <input checked="" type="radio"/> Public <input type="radio"/>	Soak pit <input type="radio"/>	Bin <input type="radio"/>
Toilet	Public <input checked="" type="radio"/>	Septic <input type="radio"/>	Open <input type="radio"/>
Disposal	Other <input type="radio"/>	Sewage <input type="radio"/>	Other <input type="radio"/>

First name: _____
Last name: _____
Address: _____



IT-220 Final Grading

$$\max\{\text{CC}, \alpha\text{CC} + \beta\text{challenge}\}$$