Think.
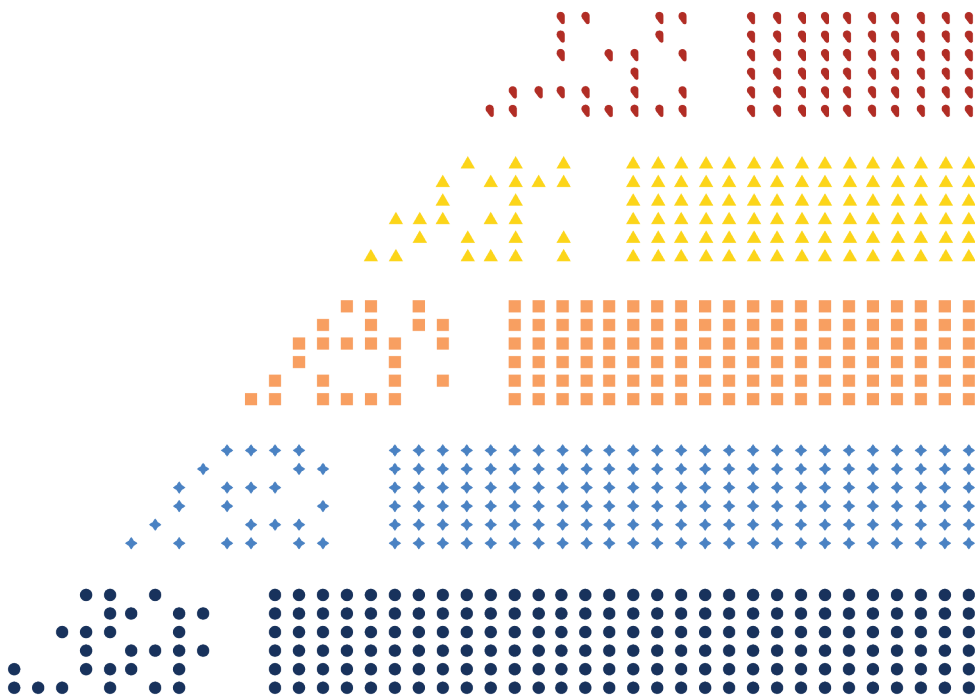
Create.

Solve.

**2017 Asia-Manila Regional
Programming Contest
December 13–15, 2017**

ATENEO DE MANILA
UNIVERSITY

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Programming Contest**

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*advancing the art and sport of
competitive programming*

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accenture

acer

Carlos Primo C. David
Executive Director
Department of Science and Technology-PCIEERD
Republic of the Philippines

The DOST-PCIEERD wishes the best to the Ateneo De Manila University – School of Science and Engineering for hosting the ACM International Collegiate Programming Contest (ACM-ICPC). We join in the excitement as this is the most prestigious global programming competition conducted and participated by more than 2,000 universities from over 91 countries in six (6) continents.

The Philippines has missed out in becoming a player in the various technological waves such as the personal computer, internet and mobile devices. The next wave will be in DCI (Data; Connectivity; and Intelligence). DCI is starting to ramp up in its fast growth phase and we believe that we can compete in DCI and be a major player. Our main asset would be in the highly skilled/trainable manpower base we have. It is foreseen as well that new outsourcing businesses will arise for DCI. To do this, a comprehensive strategy is drawn starting with: massive local and foreign training, scholarships for DCI, strategic partnerships particularly in the hardware compo-nent.

The DOST is also aggressively pursuing its scholarship programs in Data Science, Internet of Things, and Artificial Intelligence (AI), among other areas. Our resolve is not to be left behind but be aggressive and engage in these areas.

It is for this very reason that we are fully supporting the ACM-ICPC which is one good activity that contributes to the improvement of human resource capacities in various S&T areas like programming.

We further commend the hosting this year the special award for women in computing – the 2017 ACM-ICPC Asia-Manila Regional Contest and ACM Special Interest Group on Women in Computing-Philippines, through the cooperation of the Computing Society of the Philippines Special Interest Group on Women in Computing, call for Female Contestants at the 2017 ACM-ICPC Asia-Manila Regionals.

Jose Ramon T. Villarin, SJ
President
Ateneo de Manila University

It is with joy and honor that I welcome the participants of the 2017 ACM International Collegiate Programming Contest Asia-Manila Regionals to the Ateneo de Manila University. More than one hundred teams are competing this year, a sign that interest in the field of programming among the youth in the Asia-Pacific region is vibrant and continues to flourish.

With the ubiquity of digital technology in almost all areas of our lives-from kitchen gadgets to transportation systems, from mobile apps to data analytics-this newfound power of software promises all sorts of exciting developments for the Asia-Pacific region and the rest of the world.

Ateneo de Manila is committed to continue developing the field through the hosting of the ACM-ICPC Asia-Manila Regionals and the expansion of the computer science courses and degrees that we offer. Soon we shall be offering several master's degrees in Data Science, Big Data Science, and Media Arts and Technology, with dual degrees in partnership with Queen Mary University of London in the United Kingdom.

I wish you all the best in this competition. May it not only be a platform for displaying programming prowess but a showcase of what programmers can do to improve the lives of people all over the world.

Maria Luz C. Vilches
Vice President for the Loyola Schools
Ateneo de Manila University

On behalf of the Loyola Schools, I warmly welcome all the participants at the ACM International Collegiate Programming Contest (ICPC) Asia-Manila Regionals 2017 to our lush and green campus!

It is Ateneo de Manila University's great honor to host again this most prestigious global programming competition in the world. It's awesome that this contest is conducted and participated in by more than two thousand universities from over 91 countries in six continents! Even just for two days, the Ateneo de Manila is well spotted as truly an enviable hub for extraordinary talents in the technological expertise of computer programming! As an outsider to the field, I cannot grasp that enough. But I must say, I feel overwhelmed even just by the sheer thought that we have indeed got those talents gathered together on our campus.

I understand that this year's contest's unique feature is the giving of a special award for women in computing. For recognizing the contribution of women to this field is something I salute the organizers for: the 2017 ACM-ICPC Asia-Manila Regional Contest and ACM Special Interest Group on Women in Computing-Philippines, and in cooperation with the Computing Society of the Philippines Special Interest Group on Women in Computing. The special cash award will go a long way in encouraging the participation of more female contestants in the next rounds.

I wish all the contestants the best so they can qualify for the ACM-ICPC World Finals. That higher level competition would be tough. You will be challenged by contenders from MIT, Virginia Tech, Shanghai Jiao Tong, University of Warsaw, University of Tokyo, National University of Singapore and many others. But I'm sure you all believe in the adage, 'nothing is impossible under the sun,' for such talents as yours.

Work hard but don't forget to have fun as well. Remember that a lot of creativity and innovation is born out of joy.

Ma. Mercedes T. Rodrigo
Regional Contest Director
Ateneo de Manila University

I have been a fan and a supporter of the ACM International Collegiate Programming Competition for the last 15 years. While I had initially regarded the ICPC as another contest that was there to be won, I eventually grew to appreciate it as being more than that. It was a venue to work with truly excellent individuals who were passionate about computer science, mathematics, and algorithmic thinking. It was motivation to work hard to increase local skills and talent in these areas. It was a standard to aspire for, one that constantly leveled up each year. It was an opportunity to build community, to unite efforts to reach for these goals together.

I therefore express my sincere and heartfelt gratitude to the many members of the Manila Regionals' community who helped make this event possible:

To the 36 participating teams of the 2017 ACM-ICPC Manila Regionals, welcome to the Ateneo de Manila University! You represent 22 universities from the Philippines, China, Indonesia, Singapore, South Korea, Thailand, and Vietnam. Thank you for travelling across land and seas, and for braving the Christmas traffic of Metro Manila to participate in this event.

Schedule of Activities

Day 1: Wednesday, 13 December 2017
Opening Ceremony and Practice Session

Start	End	Activity	Venue
11:00 AM	1:30 PM	Registration and Lunch	2F Gonzaga Hall
1:30 PM	3:00 PM	Opening Ceremony - Philippine National Anthem - Opening Remarks - Introduction of Teams - Snacks	Escaler Hall
3:00 PM	3:30 PM	Team Pictorial	
3:30 PM	5:30 PM	Practice Session and Final Reminders	5F Rizal Library
5:30 PM		End of Day 1	

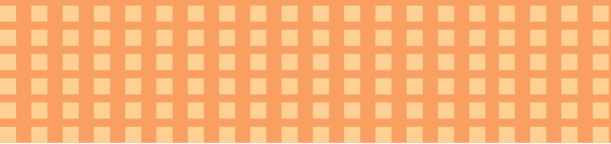**Day 2: Thursday, 14 December 2017**
Contest Proper

Start	End	Activity	Venue
7:00 AM	9:30 AM	Breakfast and Registration	Leong Hall
9:30 AM	10:00 AM	Recap of Rules and Final Reminders	5F Rizal Library
10:00 AM	3:00 PM	2017 ACM-ICPC Asia-Manila Regional Contest Proper	
12:00 PM	1:00 PM	Lunch	
3:00 PM	4:30 PM	Filipino Merienda	
4:30 PM	7:00 PM	Closing Ceremony	Leong Hall Auditorium
7:00 PM	8:30 PM	Buffet Dinner	Leong Hall Roofdeck
8:30 PM		End of Day 2	

Day 3: Friday, 15 December 2017
Fellowship

Start	End	Activity	Venue
8:00 AM	9:00 AM	Registration	5F Rizal Library
9:00 AM	12:00 PM	Fun and Games	
12:00 PM		End of Day 3	

Teams

Ateneo de Davao University
Blueknights

Ateneo de Manila University
;hack
Bcc:
JAM
O(bf)
Re:Programmers

Ateneo de Naga University
Unexpected

Cebu Institute of Technology
CITU 10X

Chulalongkorn University
CPCU 4197
CPCU
  HEYYEYAAEYAAAEYAEYAA
CPCU K-GOD

De La Salle University
Blackjack
Highwind
Panic

FEU Institute of Technology
Exceptions

FPT University
FPT_HAN_ThreeFrogs
FPT_HAN_VTeam

Jose Maria College
RjEaCa

Lorma Colleges
troubleShooters

Malayan Colleges Laguna
CCIS2017

Nanyang Technological University
NTU Three-headed
  Monster
NTUNOOBS

National University - Philippines
NU Wizards Circle Team A

National University of Singapore
Pandamiao

Parahyangan University
Smoking Wombat

Shanghai Jiao Tong University
Blazar

Technological Institute of the Philippines Quezon City
A^3
A1Q
AN2KINS

Ulsan National Institute of Science and Technology
The Hedgehogs

University of Mindanao Tagum College
Team UMTC

University of Santo Tomas
BTNode
Fibonachips

University of the Philippines - Diliman
Quiwarriors 1

University of the Philippines - Los Baños
Eliens-Makiling
Eliens-Pegaraw

Contest Rules

Each team will be randomly assigned a workstation.

Teams will compete to solve 8-13 problems in 5 hours
Each problem consists of the following:

- problem statement: a description of the problem (in English)
- input-output specifications: details on input and
- output format, including constraints which should be handled (output must have an exact match with the format specification)
- sample input-output
- time limit: maximum time allowed for the program to run and produce expected output

Teams may request for clarifications about the problems using the contest management system.
If all judges agree that ambiguity is present in the problem, a broadcast of the clarification will be made to all teams.

Should a contestant require use of the restroom during the contest proper, the contestant will be accompanied by a designated usher.

Submissions

Teams should submit their source code using the contest management system any time during the contest period.

A problem is solved when it is accepted by the judges. To accept or reject a submission, judges will compile and test the program with a different set of test data which have been prepared in advance.

Each submission will get one of the following responses:

• Accept: The program produced the correct output within the specified run time and memory limits without any errors. This program is accepted by the judges and the problem is considered as solved.

• Wrong Answer: The program did not produce the correct output.

• Runtime Error: The program crashed (runtime error) when processing the test data.

• Time Limit Exceeded: The program took more than the specified time limit to produce output and properly terminate.

• Compile Error: The submitted source code can not be compiled.

Fair Competition

A team may be disqualified due to any form of cheating or any attempt at cheating. A team may also be disqualified for any act that jeopardizes the contest (e.g. hacking or tampering with equipment, dislodging electrical or network cables, distracting behavior, etc). All teams are expected to uphold sportsmanship and the spirit of fair competition. Contestants are not allowed to access any webpages or websites.

Ranking

Teams are ranked according to the most number of problems solved. Teams who solve the same number of problems are ranked by least total time. The total time is the sum of the time consumed for each solved problem (in minutes). The time consumed for a solved problem is the time elapsed from the beginning of the contest to the submission time of the accepted run, plus 20 penalty minutes for every rejected submission of that problem.

All inquiries, concerns, and protests on the results must be brought to the attention of the Regional Contest Director and the Chief of Judges within three (3) days of the competition's closing ceremony before elevating such concerns to ACM ICPC.

Team Notebook

Each team may bring reference material for use during the contest proper, according to the following limitations:

*   It may contain up to 25 pages of reference materials,machine-printed on single-sided Letter (8 x 11 inches) or A4 size paper (210 x 297 mm), with pages numbered on the upper right hand corner.

*   It may contain code listings, algorithms, hints, or any other necessary notes.

*   Each team member may have an exact copy of the team reference document.

*   Text and illustrations must be readable by a person with correctable eyesight without magnification from a distance of 0.5 meter.

The team may also bring stationery (pens, pencils, erasers, rulers, protractors, etc.), and a printed English dictionary (not electronic) without any annotations. Each team will be provided with blank paper during the contest proper.

All materials (team notebooks, stationery, etc.) will be collected on the first day (Dec 13) for inspection. The materials will then be placed in the team's designated workstation for the contest proper.

No other materials are allowed in the contest area.

Teams are not allowed to bring:
- any digital materials (e.g. e-books, soft copy code, etc.)
- any digital devices (e.g. flash drives, external hard drives, keyboards, etc.)
- any other electronic devices (e.g. mobile phones, smart watches, calculators, laptops, etc.)

Contestants are expected to switch off all communication devices and surrender such devices to their respective coaches for the duration of the contest.

Computing Environment
Hardware
    Desktop Computer
    Intel Core i5
    4GB RAM
    500GB HDD
    Ubuntu 16.04.1 OS

Programming Languages
    Java 1.8.0 update 111
    Javadocs 1.8.0 update 111
    Python 2.7.12 (python on command line)
    Python 3.5.2 (python3 on command line)
    GCC/G++ 5.4.0

Development Environment
    Eclipse Cpp Neon 1 v4.6.1 with PyDev
    Eclipse Java Neon 1 v4.6.1 with PyDev
    Sublime 3 build 3126
    Atom 1.12.4

Contest Management System
    PC^2 9.4.1

Local Information

Smoking
Ateneo de Manila University is a **smoke-free** campus.

Telecommunications
When calling Manila from abroad, phone numbers follow the format:

       Landline numbers: +63-2-###-####
       Mobile numbers: +63-9##-###-####

Prepaid mobile SIM cards are widely accessible in airports, malls, convenience stores. ACM-ICPC Asia-Manila recommends the services of Smart Communications.

Electrical Voltage
Electrical voltage in the Philippines is 220 volts. Gadgets and appliances that require 110 volts should use a voltage converter.

Language
The Philippines, especially Manila, is generally bilingual (English and Filipino). Provinces and regions across the country also speak a variety of dialects.

Weather / Climate
The Philippines has a tropical monsoon climate. The month of December falls within the dry season, with occasional rainshowers. The average temperature in December falls between 22°C and 32°C.

Getting Around

When traveling from the airport, or any other place in Metro Manila, there are several options for transportation. ACM-ICPC Asia-Manila recommends the following:

UBER/Grab

Download the mobile applications and register for an account. This service requires an internet connection.

Specify your pick-up point and your destination.

If coming from the airport, specify the airport terminal as the pick-up point, e.g. NAIA Terminal 3.

The application will display the estimated fare to be paid. Payment may be made in cash or charged via credit or debit card.

The application displays a notification with the vehicle and driver information. Most vehicles accommodate four passengers and two medium luggage.

Metered Taxi

Taxis are clearly marked and appear in a variety of colors. The flag-down rate is Php 40.00. Always insist that the driver activates the meter.

If coming from the airport, look for the queue for the yellow metered taxi. Metered taxis usually accommodate four passengers and two medium luggage.

Car Service

At the airport, there are counters for different car services. These car services provide a vehicle and a driver. These usually cost more than Uber or Metered Taxi. It may be worth considering when travelling with a large group.

Hotels also offer the paid option to arrange for transportation from and to the airport.

For more airport information, visit http://www.manila-airport.net/

Location Maps

From Campus to:

- UP Town Center: https://goo.gl/maps/irZfgRPD8dp
- Eastwood City: https://goo.gl/maps/qnTWmpuBSMq
- SM Marikina: https://goo.gl/maps/VpHno2nPf8B2
- Gateway Mall: https://goo.gl/maps/NjuFBCejjW42

Shuttle Schedule

ACM-ICPC Asia-Manila will provide shuttle services to transfer between partner hotels and the Ateneo de Manila campus. Participants who intend to make use of this service should inform the organizers via email at info.discs@ateneo.edu or text message (SMS) at +63 908 343 5761.

Shuttle service is available to participants staying at Microtel Acropolis and Soleste Suites

Day	From	To	Shuttle departs at
Wednesday, 13 December	Hotel	Ateneo de Manila	10:30 AM Hotel Lobby
Wednesday, 13 December	Ateneo de Manila	Hotel	6:00 PM Leong Hall Driveway
Thursday, 14 December	Hotel	Ateneo de Manila	6:30 AM Hotel Lobby
Thursday, 14 December	Ateneo de Manila	Hotel	8:30 PM Leong Hall Driveway
Friday, 15 December	Hotel	Ateneo de Manila	7:30 AM Hotel Lobby
Friday, 15 December	Ateneo de Manila	Hotel	12:30 PM Leong Hall Driveway

Important Contact Numbers

Embassy and Consulate Numbers

Embassy of the Republic of Indonesia
892 5061 to 68
unitkom.manila@kemlu.go.od
http://www.indonesianembassy.org.ph

South Korea
Embassy of the Republic of Korea
856 9210
ph04@mofa.go.kr
http://embassy_Philippines.mofa.go.kr

Singapore
Embassy of the Republic of Singapore
856 9922, 856 9922
singemb_mnl@mfa.sg
http:// www.mfa.gov.sg/manila

Vietnam
Embassy of the Socialist Republic of Vietnam
521 6843
vnembph@yahoo.com
http://www.vietnamembassy-philippines.org

China
Embassy of the People's Republic of China
Operator: 0063-2-8443148 local 101
ph@mofcom.gov.cn
http://ph.china-embassy.org/eng/

Thailand
Royal Thai Embassy
(632) 815-4219-20; (632) 810-3833
infomnl@pldtdsl.net
https://www.thaiembassymnl.ph/en/

ACM-ICPC Asia-Manila Hotline
+63 908 343 5761

Emergency Numbers
When dialing from a local telephone in Metro Manila, dial the number directly. If using a mobile phone, local or international, use the format +63-2-###-####.

National Emergency Hotline
911

National Disaster and Risk Reduction and Management Council (NDRRMC)
911 5061 to 65
911 1406, 912 2665, 912 5668, 911 1837

Red Cross
143
527 0000, 527 8385 to 95

Department of Interior and Local Government (DILG)
+63 917 627 9627

Philippine National Police (PNP) Hotline
117
722 0650
+63 917 847 5757

Bureau of Fire Protection
426 0219, 426 3812, 426 0246

Metro Manila Development Authority (MMDA) Hotline
136
882-4150 to 77

People

Honorary Chairs
Dr. Maria Luz Vilches, VP for the Loyola Schools
Dr. Evangeline P. Bautista, SOSE Dean
Dr. Andrei Coronel, DISCS Chairperson

Directors
Prof. C.J. Hwang, ACM-ICPC Asia Director
Dr. Didith Rodrigo, ACM-ICPC Asia-Manila
	Regional Contest Director
Ms. Jessica Sugay, ACM-ICPC Asia-Manila
	Associate Regional Contest Director

Judges
Kevin Charles Atienza (Chief Judge) - HackerRank
Jared Guissmo Asuncion, M.Sc. - Universiteit Leiden/
	Université de Bordeaux
Karl Ezra Pilario, M.Sc. - University of the Philippines
	Diliman /Cranfield University
Kyle Stephen See, Ateneo de Manila University
Payton Robin Yao, M.Sc. - National University of Singapore
Tim Joseph Dumol - Lead Site Reliability Engineer, Kalibrr
Pablo Manalastas, Ph.D. - University of the Philippines
	Diliman / Ateneo de Manila University

Technical and Administrative Team

Mr. Carlo Sanchez

Ms. Lisa Agbay

Mr. Andrei Jaramillo

Mr. Tristan Manalang

Mr. Ronald Panergo

Ms. Joannie Jaramilla

Ms. Melinda Nicdao

Core Team

Ms. Jessica Sugay

Mr. Japheth Samaco

Ms. Pearl Santos

Mr. JM Santos

Ms. Chiara Señires

Mr. Jeff Andawi

Ms. Irene Bermejo

Mr. Karl Jimenez

Ms. Kimberly Ang

Ms. Karleen Balonan

Ms. Cheska Rebosa

Ms. Vida Leyble

Ms. Ali Miranda

Mr. Juan Troncales

Mr. Dale Galindez

Mr. Chesco Mamaradlo

Mr. Quitos Vista

Ms. Samantha Que

Ms. Sher De Guzman

Mr. Carlo de Leon

Ms. Piel Arcilla

Mr. Jarod Catolico

Ms. Steph Robles

Mr. EJ Tiongco

Mr. Gab De Jesus

Ms. Gab Barbudo

Mr. Tomy Callanta

Mr. CJ Alcantara

Think.
Create.
Solve.

2017 Asia-Manila Regional Programming Contest

FR. MASTERSON DRIVE

XAVIER HALL (DROP-OFF POINT)

Berc
H

Faber Hall

Old Rizal Library

RED BRICK ROAD

Social Sciences Building

Horacio Dela Costa Building

Faura Hall

LEONG HALL (DROP-OFF POINT)

NEW RIZAL LIBRARY

ARETE

CAMPU

GATE 3.5

ATENEO GATE 3

Hohmans Hall

GONZAGA HALL (DROP-OFF POINT)

FR. MASTERSON DRIVE

RED BRICK ROAD

ESCALER HALL (SEC-A BUILDING)

Matteo Ricci Study Hall

SEC-B Building

Schmitt Hall

JSEC (DROP-OFF POINT)

SEC-C Building

CTC-SOM Building

PIPAC

US MAP

Football Field Track Oval

GATE 2.5

GATE 2

KATIPUNAN

TO UP TOWN CENTER

EXIT TO NORTH BOUND

ATENEO GATE 3

EXIT FROM JSEC

ATENEO GATE 2

B. GONZALES

F. DELA ROSA

ESTEBAN ABADA

R. ALVERO

TO MARIKINA, EASTWOOD VIA C-5

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LEGEND

- 🔵 Food/Drink
- 🟠 Grocery/Convenience Store
- 🔴 Bank/Others

1 - Sebastian's Ice Cream
2 - Brown's Gourmet
3 - Buffalo's Wings N' Things
4 - CoCo Fresh Tea & Juice
5 - BonChon Chicken
6 - The Study
7 - La Cartina
8 - Bobby Box
9 - Rap Steaks Plus
10 - Kaboom Wings + Burgers
11 - Charred Grill Station
12 - B. Wings

13 - KFC
14 - Pancake House
15 - TOSH Cafe
16 - Gino's Brick Oven Pizza
17 - Tyler's Cafe
18 - Zark's Burger
19 - Flaming Wings
20 - Fat Persian
21 - Roku
22 - Amo Yamie Crib Coffee
23 - Yellow Cab
24 - Cello's Doughnuts

25 - Cafe Sweet Inspiration
26 - Manang's Chicken
27 - Kenny Rogers Roasters
28 - Jollibee
29 - Army Navy
30 - Exile on Main Street
31 - Tito Diego's Bistro
32 - Samgyupsalamat Korean BBQ
33 - Bo's Coffee
34 - Amor Bakery
35 - Starbucks
36 - Shakey's

37 - Wok Dis Way
38 - Derf's
39 - Barkin' Blends
40 - Third Cup Cafe
41 - Eat!
42 - Chubby Chicken
43 - Starr's
44 - Brickfire
45 - Lan Kwai Hong Kong Cuisine
46 - Earle's Delicatessen
47 - Xocolat
48 - McDonalds

43 - Rustan's Supermarket
44 - 7-Eleven
45 - 7-Eleven
46 - Ministop
47 - Robinsons EasyMart
49 - 7-Eleven

50 - Banco De Oro (BDO) Regis Center
51 - Fully Booked
52 - Bank of the Philippine Islands (BPI)
53 - National Bookstore

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