Assignment 9

ROSS REELACHART

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Question 1:

For my newsfeed I chose "The Escapist Magazine" website[1], which primarily deals in video game news and articles with some general pop culture and tech news on the side. Considering the kind of articles and videos The Escapist deals in, I came up with the following categories:

- vgHardware – articles primarily dealing in hardware pertaining to video games, this includes console announcements and virtual reality headsets.
- vgSoftware – articles primarily dealing with the actual video games, updates, patches, and announcements.
- vgVideos – The Escapist sometimes uploads videos and this category is for articles that are mostly about trailers or just video themselves.
- movieNews – articles about movie or TV news, announcements, and reviews.
- movieVideos – similar to vgVideos, but with movie trailers and videos.
- generalNews – news articles that don't deal with movies, tv, or video games.
- Other – articles that don't fit into other categories, including giveaways and sales disguised as articles and comics

Below is the table of 100 entries with my selected categories for each, my "ground truth."

Article Title	Classification
The Original StarCraft and Brood War Are Now Available For Free	vgSoftware
Robot Trained to Shoot Guns is "Not a Terminator," Insists Russia	generalNews
Grab Discounts on Sniper Ghost Warrior 3 Telltale's Guardians of the Galaxy, and More	Other
High-Powered Hardware Isn't Enough to Make Project Scorpio Succeed	vgHardware
The PS4 Slim Will Now Come With a 1 TB Hard Drive	vgHardware
Star Wars: Battlefront II Will Hit Origin Access Over a Week Before Launch	vgSoftware
Get a Two-Year Subscription to Private Internet Access VPN and Save 63%	Other
NES Classic Edition Discontinued Worldwide	vgHardware
Guardians of The Galaxy Vol. 2 Has Five Post-Credits Scenes	movieNews
Bandai Namco's New "Prepare to Dine" Title is Vampire Action RPG Code Vein	vgSoftware
Leaked Email Reveals Twitch to Roll Out $10 and $25 Subscription Tiers in Upcoming Beta	generalNews
Overwatch's Genji, Hanamura Map Headed to Heroes of the Storm	vgSoftware
Hanamura is The Most Innovative Heroes of The Storm Map Yet	vgSoftware
(Continued on next page)	

Article Title	Classification
Mark Hamill Says it Was a "Missed Oppertunity" Not Having Luke, Leia and Han Reunite	movieNews
Guardians of The Galaxy Vol. 3 Confirmed, James Gunn to Direct	movieNews
8 of the Strongest Video Game Villains of All Time	Other
Good Bad Flicks: Silk	movieVideos
New Injustice 2 Trailer Introduces Poison Ivy	vgVideos
Guardians of the Galaxy: The Telltale Series Launches Tomorrow, See the Launch Trailer Today	vgVideos
Master Java with the 2017 Complete Java Bundle and Save 95%	Other
Sandy Wexler - Adam Sandler Dumps Another Movie onto Netflix	movieNews
Origin PC's Newest Gaming Laptop Offers Portable Performance for Under $1,000	vgHardware
Analysts Expect Nintendo Will Release a Mini-Switch by the Spring of 2019	vgHardware
Fallout: New Vegas Cosplayer Walks Through Town in Costume, Police are Called	generalNews
Star Wars Battlefront II's Story is by Spec Ops: The Line Writer	generalNews
Take a Closer Look at The New Splatoon 2, Bayonetta, Cloud and Link Amiibo	vgHardware
The Lure - The Glam Rock Mermaid Horror Movie You Need	movieNews
Gifted - But Only Ironically	movieNews
Star Wars Battlefront II Offline Co-Op Will be Console Exclusive	vgSoftware
Star Wars Battlefront II May be Ditching the Season Pass	vgSoftware
Watch the Trailer for the Fourth, and Final, Season of Star Wars: Rebels	movieVideos
Star Wars Battlefront II launches in November - Here's the First Trailer	vgVideos
It's Good to be Bad in the Star Wars Battlefront II Singleplayer Campaign	vgSoftware
The Fate of the Furious - Cars, Family, Action!	movieNews
LEGO City Undercover Walkthrough	Ch. 10 Fire Station	vgVideos
LEGO City Undercover Walkthrough	Ch. 10 Uptown Museum	vgVideos
LEGO City Undercover Walkthrough	Ch. 9 Bringing Home the Bacon	vgVideos
Overwatch's Competitive Skill Rating is Broken for Healers Right Now	vgSoftware

Article Title	Classification
Carrie Fisher Won't be In Episode IX After All	movieNews
8 Great Weapon Mods for Fallout 4	Other
#010: ABD	Other
How to Get The Best Breath of The Wild Shield | Hylian Shield Location Guide	vgVideos
Save 58% on Blue Apron and Take the Frustration Out of Cooking	Other
Use Your Words Review - A Party Game for Wordsmiths	vgSoftware
Star Wars: The Last Jedi Official Teaser Trailer Released	movieVideos
Bullitt - Who Wants a Great Car Chase?	movieNews
Judging By The Cover: Judging Half-Life	vgVideos
New Ghost Recon Wildlands Update Fixes Bugs, Adds Live Challenges	vgSoftware
TItanfall 2 is Getting More Maps, a New Titan, and More	vgSoftware
The Nintendo Switch is Officially the Company's Fastest Selling Console Ever	vgHardware
Oculus has Filed for a New Trial in the Zenimax Lawsuit	vgHardware
The Final NES Classic Edition Shipments are Hitting North America This Month	generalNews
Get a $5,000 Lifetime Stock Photo Subscription for Just $29	Other
The Newest Dawn of War III Trailer Lets You Meet the Game's Voice Actors	vgVideos
Rick and Morty: Virtual Rick-ality Arrives on April 20	vgSoftware
New Third Party Switch Charging Case Adds Battery Life and Moves the Charging Port	vgHardware
Microsoft Will Reveal Project Scorpio at E3 2017	vgHardware
Solve Every Futaba Palace Puzzle in Persona 5 With These Solutions	Other
Bandai Namco Teases New Title With "Prepare to Dine" Tagline	vgSoftware
Niantic Announces Pokemon Go Easter Event	vgSoftware
Microsoft is Adding Self-Service Refunds to Xbox One and Windows 10	Other
5 Journey to Un'Goro Cards That Could Already Use a Nerf	vgSoftware
Cities: Skylines' Mass Transit DLC Arrives Next Month	vgSoftware
All The Nintendo Switch/3DS Release Dates From Today's Direct	generalNews
(Continued on next page)	

Article Title	Classification
Nine New Amiibo Revealed: Link, Bayonetta and More	vgHardware
ARMS Release Date Revealed Alongside New JoyCon Battery Pack	vgSoftware
Splatoon 2 Release Date, "Salmon Run" Mode, Revealed	vgSoftware
Josh Brolin Cast as Cable in Deadpool 2	movieNews
Bethesda is Releasing a Prey Demo With the First Hour of the Game April 27	vgSoftware
LEGO City Undercover Walkthrough	Ch. 8 The Rescue	vgVideos
Grab Glasswire Pro or Elite to Keep Your PC Healthy and Save Big	Other
LEGO City Undercover Walkthrough	Ch. 7 One Small Job for Chan	vgVideos
LEGO City Undercover Walkthrough	Ch. 6 All in the Family	vgVideos
Overwatch Update 1.10 Tweaks How Streaks Affect Your Rating	vgSoftware
No Man's Universe	Other
Zero Punctuation: Yooka-Laylee	vgVideos
Gears of War 4 is Going to Let PC and Xbox One Gamers Go Head-to-Head in Ranked Matches	vgSoftware
Kaplan Discusses Possible Changes to Overwatch's Play of the Game	vgSoftware
The Latest Injustice 2 Trailer Details the Game's Gear System	vgVideos
Grab Your Key in our Faeria Battle Chest Giveaway Right Here	Other
Platinum Games Wants All of Its Games on PC, But Publishers Say No	generalNews
Diablo 3's Necromancer Class Now Avalaible For Closed Beta Testing	vgSoftware
8 Comic Book Characters Who Deserve Their Own Movie	Other
Get the Cheapest Steam Key for Bayonetta, Dishonored 2, Microsoft Sale	Other
There's Not Much Role-Playing in Role-Playing Games These Days	Other
#009: The Criminal Element	Other
Blizzard Officially Announces the Next Overwatch Event	generalNews
A New Map is Coming to Battlefield 1 in June, and it's Free to Premium Pass Owners	vgSoftware
Uncharted: The Lost Legacy Release Date Revealed	vgSoftware

Article Title	Classification
Bayonetta Launches on Steam Today With 4K Support and New Graphics Options	vgSoftware
The Next Round of the Quake Champions Beta Begins Thursday	vgSoftware
Blizzard Lists Nendoroid Mei for Pre-Order	generalNews
Dawn of War III Cinematic Shows Off the Opening of the Imperial Campaign	vgVideos
Overwatch's Insurrection Event Trailer Leaked Ahead of Announcement	vgVideos
Splatoon 2, ARMS - Focused Nintendo Direct Tomorrow	vgSoftware
Journey to Un'Goro Pack Distribution is Working as Intended, Says Blizzard	generalNews
8 Video Games That Catered to Perverts	Other
You Can Play The Elder Scrolls Online Free for a Week	Other
Update: Gearbox Backs Out of Controversial Bulletstorm/G2A Promo	generalNews
Rumor: Bioware Austin is Prototyping a Knights of the Old Republic Game	generalNews

Question 2

To train and then classify the entries, I created the python program *classifyBlogs.py* which was mostly taken from slide 26 of the week 14 slides[2]. In order to make this program work, I needed to also download the *feedfilter.py, feedparser.py, and docclass.py* programs from the PCI book[3].

The following 50 entries were after the first 50 entries were used to trains the program.

Title	Actual	Predicted
Oculus has Filed for a New Trial in the Zenimax Lawsuit	vgHardware	vgSoftware
The Final NES Classic Edition Shipments are Hitting North America This Month	generalNews	vgHardware
Get a $5,000 Lifetime Stock Photo Subscription for Just $29	Other	Other
The Newest Dawn of War III Trailer Lets You Meet the Game's Voice Actors	vgVideos	vgVideos
Rick and Morty: Virtual Rick-ality Arrives on April 20	vgSoftware	movieNews
New Third Party Switch Charging Case Adds Battery Life and Moves the Charging Port	vgHardware	vgSoftware
Microsoft Will Reveal Project Scorpio at E3 2017	vgHardware	vgHardware
Solve Every Futaba Palace Puzzle in Persona 5 With These Solutions	Other	vgVideos
Bandai Namco Teases New Title With "Prepare to Dine" Tagline	vgSoftware	vgSoftware
Niantic Announces Pokemon Go Easter Event	vgSoftware	Other
(Continued on next page)		
Microsoft is Adding Self-Service Refunds to Xbox One and Windows 10	Other	generalNews
5 Journey to Un'Goro Cards That Could Already Use a Nerf	vgSoftware	Other
Cities: Skylines' Mass Transit DLC Arrives Next Month	vgSoftware	vgHardware
All The Nintendo Switch/3DS Release Dates From Today's Direct	generalNews	vgHardware
Nine New Amiibo Revealed: Link, Bayonetta and More	vgHardware	vgHardware
ARMS Release Date Revealed Alongside New JoyCon Battery Pack	vgSoftware	vgSoftware
Splatoon 2 Release Date, "Salmon Run" Mode, Revealed	vgSoftware	vgHardware
Josh Brolin Cast as Cable in Deadpool 2	movieNews	generalNews
Bethesda is Releasing a Prey Demo With the First Hour of the Game April 27	vgSoftware	vgSoftware
(Continued on next page)		

Title	Actual	Predicted
LEGO City Undercover Walkthrough | Ch. 8 The Rescue	vgVideos	vgVideos
Grab Glasswire Pro or Elite to Keep Your PC Healthy and Save Big	Other	Other
LEGO City Undercover Walkthrough | Ch. 7 One Small Job for Chan	vgVideos	vgVideos
LEGO City Undercover Walkthrough | Ch. 6 All in the Family	vgVideos	vgVideos
Overwatch Update 1.10 Tweaks How Streaks Affect Your Rating	vgSoftware	vgSoftware
No Man's Universe	Other	vgVideos
Zero Punctuation: Yooka-Laylee	vgVideos	vgVideos
Gears of War 4 is Going to Let PC and Xbox One Gamers Go Head-to-Head in Ranked Matches	vgSoftware	vgVideos
Kaplan Discusses Possible Changes to Overwatch's Play of the Game	vgSoftware	vgSoftware
The Latest Injustice 2 Trailer Details the Game's Gear System	vgVideos	vgVideos
Grab Your Key in our Faeria Battle Chest Giveaway Right Here	Other	Other
Platinum Games Wants All of Its Games on PC, But Publishers Say No	generalNews	vgVideos
Diablo 3's Necromancer Class Now Avalaible For Closed Beta Testing	vgSoftware	generalNews
8 Comic Book Characters Who Deserve Their Own Movie	Other	Other
Get the Cheapest Steam Key for Bayonetta, Dishonored 2, Microsoft Sale	Other	Other
There's Not Much Role-Playing in Role-Playing Games These Days	Other	vgVideos
#009: The Criminal Element	Other	Other
Blizzard Officially Announces the Next Overwatch Event	generalNews	vgSoftware
A New Map is Coming to Battlefield 1 in June, and it's Free to Premium Pass Owners	vgSoftware	vgSoftware
Uncharted: The Lost Legacy Release Date Revealed	vgSoftware	Other
Bayonetta Launches on Steam Today With 4K Support and New Graphics Options	vgSoftware	vgSoftware
The Next Round of the Quake Champions Beta Begins Thursday	vgSoftware	vgSoftware
Blizzard Lists Nendoroid Mei for Pre-Order	generalNews	vgSoftware
Dawn of War III Cinematic Shows Off the Opening of the Imperial Campaign	vgVideos	vgVideos
Overwatch's Insurrection Event Trailer Leaked Ahead of Announcement	vgVideos	vgSoftware

Title	Actual	Predicted
Journey to Un'Goro Pack Distribution is Working as Intended, Says Blizzard	generalNews	generalNews
8 Video Games That Catered to Perverts	Other	Other
You Can Play The Elder Scrolls Online Free for a Week	Other	vgSoftware
Update: Gearbox Backs Out of Controversial Bulletstorm/G2A Promo	generalNews	vgSoftware
Rumor: Bioware Austin is Prototyping a Knights of the Old Republic Game	generalNews	vgVideos

Now I needed to calculate the computing precision, recall, and F-measure for six of my seven categories. The category "movieVideos" did not appear at all in the latter 50 entries, and cannot be calculated. The formulas for calculating each are as follows:

- Precision = TP / (TP + FP)
- Recall = TP / (TP + FN)
- F-Measure = 2 * P * R / (P + R)
- TP = True Positive = Case was positive and predicted was negative
- FP = False Positive = Case was negative but predicted positive*
- FN = False Negative = Case was positive but predicted negative
- *False Positive is not possible when the actuals are listed already

Below is the confusion matrix for the six classes:

	Predicted Class	vgHardware	vgSoftware	vgVideos	movieNews	generalNews	Other
True Class							
vgHardware		2	2	0	0	0	0
vgSoftware		3	8	1	1	1	3
vgVideos		0	1	7	0	0	0
movieNews		0	0	0	0	1	0
generalNews		2	3	2	0	1	0
Other		0	1	3	0	1	6

And the following table arranges all the calculated values:

	TP	FP	FN	Precision	Recall	F-Measure
vgHardware	2	0	2	1	0.5	0.667
vgSoftware	8	0	9	1	0.471	0.64
vgVideos	7	0	1	1	0.875	0.933
movieNews	0	0	1	1	0.0	0
generalNews	1	0	7	1	0.125	0.222
Other	6	0	5	1	0.545	0.706
Avg. Precision = 1		Avg. Recall = 04.19		Avg. F-Measure = 0.529		

Question 3

Question 2 repeated but the first 90 entries were used to train. The following table are the remaining 10 entries:

Title	Actual	Predicted
The Next Round of the Quake Champions Beta Begins Thursday	vgSoftware	vgSoftware
Blizzard Lists Nendoroid Mei for Pre-Order	generalNews	generalNews
Dawn of War III Cinematic Shows Off the Opening of the Imperial Campaign	vgVideos	vgVideos
Overwatch's Insurrection Event Trailer Leaked Ahead of Announcement	vgVideos	vgVideos
Splatoon 2, ARMS - Focused Nintendo Direct Tomorrow	vgSoftware	vgHardware
Journey to Un'Goro Pack Distribution is Working as Intended, Says Blizzard	generalNews	generalNews
8 Video Games That Catered to Perverts	Other	Other
You Can Play The Elder Scrolls Online Free for a Week	Other	other
Update: Gearbox Backs Out of Controversial Bulletstorm/G2A Promo	generalNews	vgVideos
Rumor: Bioware Austin is Prototyping a Knights of the Old Republic Game	generalNews	generalNews

Below is the confusion matrix for the classes (vgHardware, movieNews, and movieVideos not included):

	Predicted Class	vgHardware	vgSoftware	vgVideos	movieNews	generalNews	Other
True Class							
vgSoftware		0	2	0	0	0	0
vgVideos		0	0	2	0	0	0
generalNews		0	0	1	0	3	0
Other		0	0	0	0	0	2

And the following table arranges all the calculated values:

	TP	FP	FN	Precision	Recall	F-Measure
vgSoftware	2	0	0	1	1	1
vgVideos	2	0	0	1	1	1
generalNews	3	0	1	1	0.75	0.857
Other	2	0	0	1	1	1
Avg. Precision = 1		Avg. Recall = 04.19		Avg. F-Measure = 0.529		

References

1. http://rss.escapistmagazine.com/
2. https://github.com/phonedude/cs532-s17/blob/master/slides/week-14-document-filtering.ppt
3. https://github.com/uolter/PCI/tree/master/chapter6