National College of Ireland

Masters in Science in Data Analytics – Full-time – January start – Year 1 – MSCDAD_JAN18_A / MSCDAD_JAN18_B

Autumn / Semester Three Examinations – 2017/18

Wednesday 22nd August 2018
2.00pm – 4.00pm

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Data Visualization

Dr. Geraldine Gray
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Answer all three questions.

Duration of exam: 2 Hours
Attachments: Application Usage and Threat Report-2013, Blank Sketch Sheet.

Calculators are permitted in this exam.

1) Assume that you have been tasked to create chart(s) to visualize road accident data from your country. Discuss how would you apply the three principles of good design as articulated by Kirk (2016) in your answer.

(20 marks)

2) Given the following data, outline how you would prepare visualizations to tell a story about Fire Causes in Ireland. In your answer you should sketch out your plan for the infographic and discuss how colour can be used to enhance your story.

Causes of Fires Attended by Fire Brigades

	Chimneys/Flues/Soot/Hot Ashes	Smoking Materials	Matches/Cigarette Lighters	Rubbish Burning	Using Fuels to Kindle Fires	Cooking and Heating	Electrical Equipment	Other Equipment	Electrical Wiring Installations	Explosions	Malicious	Other Suspected Causes	Unknown Causes	Total
Carlow County Council	60	0	2	8	0	11	12	8	0	0	124	39	49	313
Cavan County Council	39	3	1	14	2	3	8	4	7	0	23	4	55	163
Clare County Council	124	1	3	58	1	10	6	5	4	1	11	34	140	398
Cork County Council	285	20	5	55	3	29	16	17	27	1	91	13	477	1039
Cork City Council	6	4	1	7	0	34	20	0	9	0	19	35	1021	1156
Donegal County Council	118	12	0	18	0	26	2	34	0	0	19	35	131	395
Dublin City Council (not Avail)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Galway County Council	197	19	4	38	3	41	7	25	2	2	35	73	371	817
Kerry County Council	125	26	2	26	0	10	12	39	15	0	16	38	222	531
Kildare County Council	216	0	1	26	0	3	8	3	4	0	50	63	559	933
Kilkenny County Council	38	0	0	0	0	1	0	0	0	0	0	0	140	179
Laois County Council	147	5	0	0	0	5	3	0	0	0	37	40	157	394
Leitrim County Council	4	0	0	0	0	22	0	0	0	0	1	6	69	102
Limerick City & Council	0	0	0	0	0	0	0	0	0	0	0	0	778	778
Longford County Council	96	0	0	76	0	3	2	23	0	0	0	1	82	283
Louth County Council	41	7	1	136	3	14	13	4	7	1	157	7	155	546
Mayo County Council	192	6	0	7	0	15	13	0	6	0	38	15	142	434
Meath County Council	29	7	1	48	0	31	9	0	30	1	9	0	521	686
Monaghan County Council	62	5	0	7	1	14	6	5	5	0	11	6	53	175
Offaly County Council	167	0	0	3	0	3	7	1	0	0	58	17	173	429
Roscommon County Council	0	0	0	0	0	0	0	0	0	0	0	0	215	215
Sligo County Council	91	1	1	15	1	10	7	1	4	0	34	4	31	200
Tipperary County Council	242	11	22	45	0	13	8	0	7	0	38	63	225	674
Waterford City & Council	47	0	0	0	0	12	11	2	0	0	137	15	476	700
Westmeath County Council	142	0	0	66	0	0	0	0	0	0	0	0	145	353
Wexford County Council	52	3	19	26	0	9	10	8	6	0	70	13	457	673
Wicklow County Council														0
	2520	130	63	679	14	319	180	179	133	6	978	521	6844	12566

Data Source: The Department of Housing, Planning & Local Government Fire Report (2018).

(40 marks)

3) Critique the Application Usage and Threat Report-2013 visualization provided and explain where pre-attentive attributes and Gestalt Principles are used in this chart?
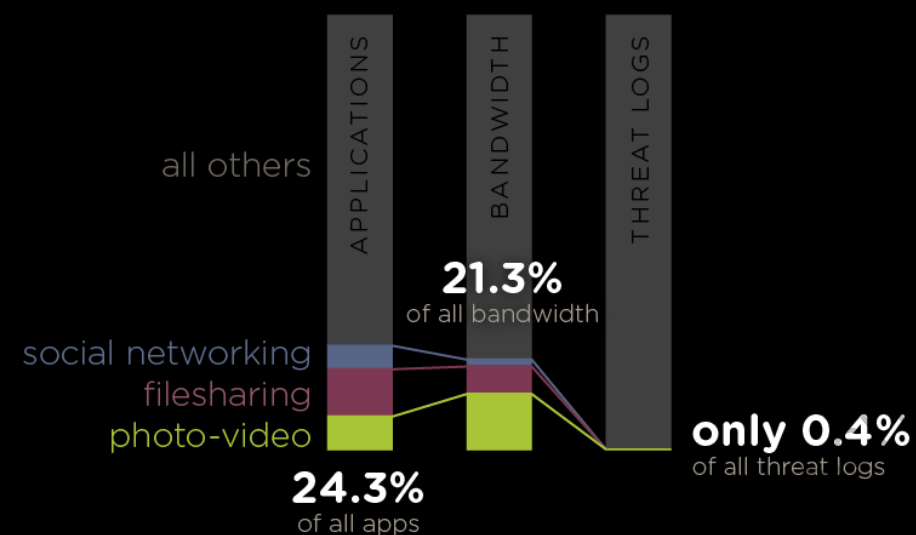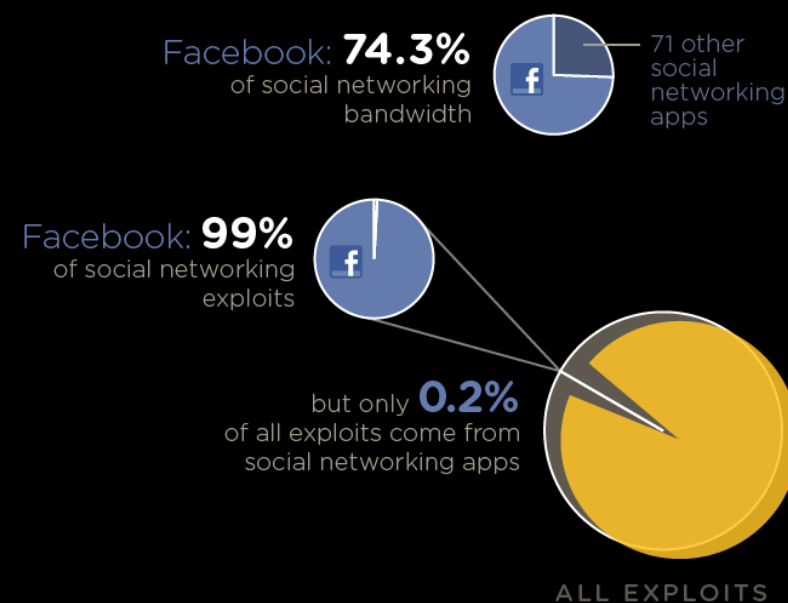
(40 marks)

Application Usage and Threat Report – February 2013

3,056 organizations worldwide · 1,395 applications detected · 12.6 petabytes consumed · 5,307 threats logged
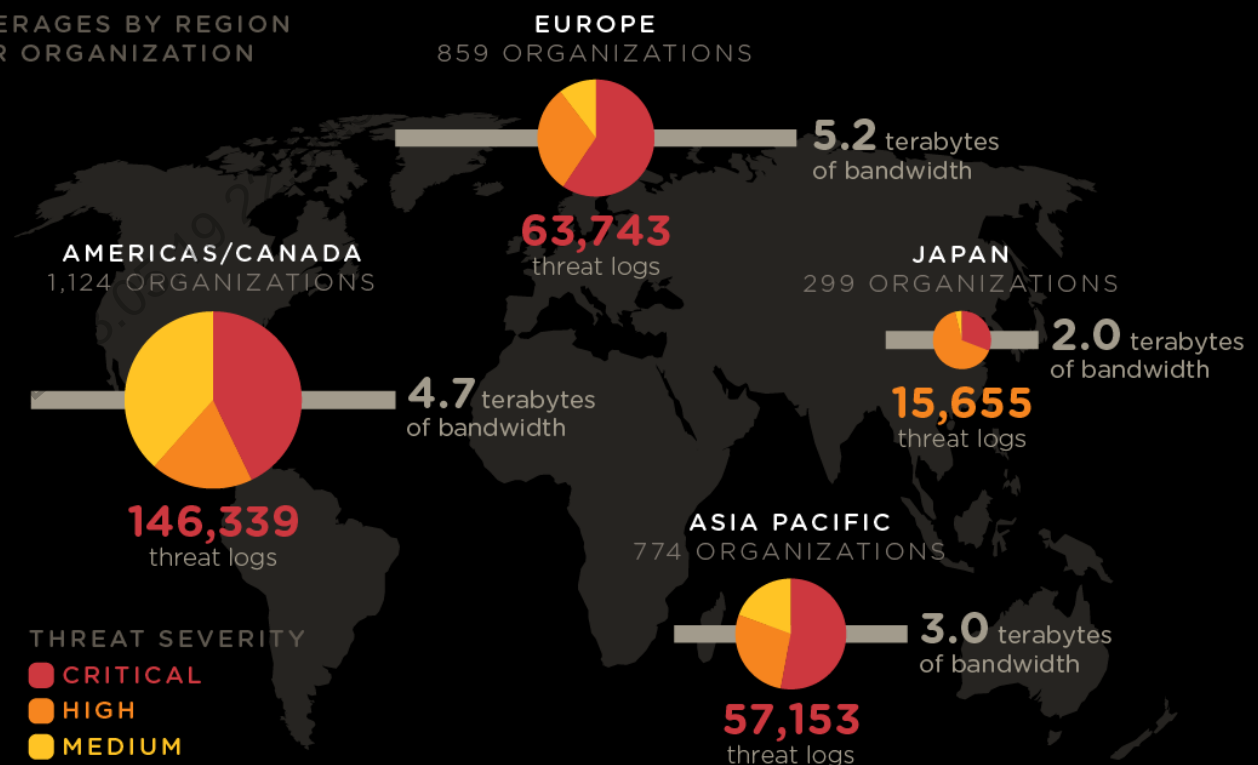
Popular sharing apps hog bandwidth but deliver fewer threats than expected

all others

APPLICATIONS   BANDWIDTH   THREAT LOGS

social networking
filesharing
photo-video

21.3%
of all bandwidth

only 0.4%
of all threat logs

24.3%
of all apps

Facebook dominates social networking

Facebook: **74.3%**
of social networking
bandwidth

71 other
social
networking
apps

Facebook: **99%**
of social networking
exploits

but only **0.2%**
of all exploits come from
social networking apps

ALL EXPLOITS

AVERAGES BY REGION PER ORGANIZATION

EUROPE
859 ORGANIZATIONS

5.2 terabytes
of bandwidth

63,743
threat logs

AMERICAS/CANADA
1,124 ORGANIZATIONS

4.7 terabytes
of bandwidth

146,339
threat logs

JAPAN
299 ORGANIZATIONS

2.0 terabytes
of bandwidth

15,655
threat logs

ASIA PACIFIC
774 ORGANIZATIONS

3.0 terabytes
of bandwidth

57,153
threat logs

THREAT SEVERITY
- CRITICAL
- HIGH
- MEDIUM

But business applications are the real Achilles heel

95% of all exploit logs were found in only **10 apps**
9 of them business applications

15,665,638	MS-SQL
13,379,971	MS-RPC
9,409,147	Web Browsing
6,779,317	SMB
6,380,406	MS SQL Monitor
3,775,694	MS Office Communicator
2,340,385	SIP
1,147,299	Active Directory
1,042,338	RPC
537,477	DNS

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