

Exercise 5: Functions and Loops

Karla Flores

10/28/2020

Functions

```
#Create a function for the mean, median, and standard deviation.  
#Mean
```

```
mean <- function(x) {  
  return(mean(x))  
}
```

```
#As was noted in class, return is not necessary  
#Using the function example shown in class
```

```
#Median
```

```
medianie <- function(x) {  
  return(median(x))  
}
```

```
#Standard Deviation
```

```
sd <- function(x) {  
  return(sd(x))  
}
```

```
#Create a function that finds the mean and excludes the lowest and highest value
```

```
nationaldata <- function(x) {  
  s <- sort(x)  
  subx <- s[-c(1, length(s))]  
  return(subx)  
}
```

```
# Apply the functions to the Christianity variables
```

```
nationaldata(national$christianity_all)
```

```
##      [1]          0          0          0          0          0          0          0  
##      [8]          0          0          0          0          0          0          0  
##     [15]          0          0          0          0          0          0          0  
##     [22]          0          0          0          0          0          0          0  
##     [29]          0          0          0          0          3         48        170  
##     [36]        199        210        211        229        263        264        300  
##     [43]        360        500        550        850        883        999       1300
```

##	[50]	1335	1441	1530	1665	1731	1792	1805
##	[57]	2010	2358	2418	2530	2707	3055	3245
##	[64]	3403	3536	3750	4193	4285	4333	4455
##	[71]	4509	5000	5279	5868	6040	6153	6219
##	[78]	6257	6277	6317	6357	6396	6436	6475
##	[85]	6516	6531	6590	6609	6674	7000	7023
##	[92]	7116	7248	7255	7287	7489	7510	7560
##	[99]	7765	8020	8088	8173	8245	8365	8454
##	[106]	8718	8930	9000	9320	9343	9530	9638
##	[113]	9700	9764	10000	10000	10397	10450	11000
##	[120]	11125	11219	11751	12172	12256	12362	12470
##	[127]	12610	12780	12870	12945	12997	13410	13816
##	[134]	14500	14576	14780	15200	15562	15570	16414
##	[141]	17475	17600	17600	18100	18347	18391	19712
##	[148]	19999	22100	22487	22665	22799	23242	23660
##	[155]	23895	24330	24640	24640	24882	24955	25000
##	[162]	25000	25450	25650	26408	26450	26550	26980
##	[169]	27120	27257	27399	27781	28088	28250	28428
##	[176]	29105	29285	29450	30158	30392	31031	31238
##	[183]	31710	32036	32798	32854	34500	35517	35819
##	[190]	36837	37107	37260	37346	37350	37997	38000
##	[197]	38155	38690	38998	39687	40280	41153	41252
##	[204]	41839	44806	45020	45435	45525	45673	47010
##	[211]	47650	48384	50790	50971	51138	51250	51347
##	[218]	51872	52000	52032	52620	52750	52829	53150
##	[225]	53166	53170	53240	54220	55650	56415	57199
##	[232]	57400	58280	58320	58435	59612	60965	61480
##	[239]	62680	62710	62999	63057	63080	63210	64054
##	[246]	64061	65000	65400	66012	66500	66700	66900
##	[253]	67160	67920	67950	68925	69050	69380	69480
##	[260]	70000	71304	71500	71776	72320	72574	72898
##	[267]	72898	72946	73940	74000	74220	74445	74823
##	[274]	74920	75257	75585	76350	76500	76719	76726
##	[281]	76950	77000	77438	77546	77611	78312	78556
##	[288]	78960	79425	79768	80000	80100	81121	81132
##	[295]	81790	82200	83500	83705	83988	85183	86566
##	[302]	87600	87995	88110	88320	88650	88677	89100
##	[309]	89800	89899	89980	90000	90100	91044	91340
##	[316]	91423	92000	92112	92590	93400	93496	93527
##	[323]	94200	94323	95826	96000	96441	96734	96782
##	[330]	96820	97160	97966	97970	98157	98745	98793
##	[337]	98880	98980	99220	99399	99499	99999	100000
##	[344]	100952	101000	103533	103560	105000	105300	106500
##	[351]	106500	108659	108745	109000	109764	110000	112150
##	[358]	112440	112970	113049	113664	114250	114699	114950
##	[365]	115000	115320	116795	117000	118460	120000	120985
##	[372]	121000	123131	123960	125000	125989	126571	126941
##	[379]	128400	129632	130480	131057	132300	132850	133399
##	[386]	135000	135978	138374	139000	139070	140694	141130
##	[393]	141305	142554	142920	144500	145399	145500	146156
##	[400]	148162	149420	149450	150000	150000	151183	151200
##	[407]	151290	152325	152400	153000	153810	155678	156000
##	[414]	158866	159500	159900	159997	160848	161200	161677
##	[421]	161773	163920	164190	164603	165300	165690	167765

##	[428]	167815	167840	168150	168900	173900	174180	174600
##	[435]	176790	176960	177173	177510	179580	180140	181800
##	[442]	182639	183005	183363	184398	185199	185640	185700
##	[449]	185756	186321	186903	187296	187999	188324	188838
##	[456]	189142	189760	190770	192222	195273	196997	197100
##	[463]	197199	197350	200000	200070	200685	205190	205500
##	[470]	205998	207634	207920	208096	208248	208630	209670
##	[477]	210500	214806	214986	216760	216774	218200	218450
##	[484]	218888	219000	220000	221480	221498	222939	223141
##	[491]	223972	224507	225000	225995	228500	229500	232406
##	[498]	234000	234934	235351	236295	236459	241000	241220
##	[505]	243000	245603	246069	253645	253800	256908	257027
##	[512]	257564	258219	262522	263248	263842	264053	265000
##	[519]	265020	268427	271680	273823	274703	277615	279687
##	[526]	280000	281835	284570	285260	285330	285630	286246
##	[533]	286740	287050	288710	289800	290063	291437	292500
##	[540]	293857	294580	297045	297531	300395	300579	300621
##	[547]	301304	301594	301720	302657	302786	303900	304000
##	[554]	305300	305704	311640	311714	313800	313950	315000
##	[561]	315460	316746	317435	317760	318600	320000	320154
##	[568]	320277	322192	323800	324795	325050	325211	325900
##	[575]	326020	327320	327399	328200	332094	333000	333791
##	[582]	334433	334470	334627	335195	338401	339545	340780
##	[589]	343964	344000	344710	345825	347260	347660	349110
##	[596]	349465	349960	349974	350140	350700	351790	352000
##	[603]	352790	354000	354998	356110	358780	360515	360998
##	[610]	361070	362200	365041	367200	368620	368900	371280
##	[617]	373012	375404	375697	376491	376823	377758	378840
##	[624]	379700	380141	380779	381003	386301	387241	387285
##	[631]	387848	389838	390579	394530	394747	395355	396637
##	[638]	398350	399997	400000	400000	400463	400900	401015
##	[645]	401310	401633	403998	404690	405810	405910	406199
##	[652]	407068	408480	410000	411998	412660	415700	415840
##	[659]	416484	418110	418500	419499	419539	419635	421345
##	[666]	427919	429477	430500	433000	433919	434972	436200
##	[673]	438000	438406	445461	446864	447270	447780	448500
##	[680]	449482	450220	452000	452150	452338	455200	458383
##	[687]	460637	462909	463236	466600	467407	469999	471111
##	[694]	471871	474000	474120	478002	481510	482878	484138
##	[701]	484916	485735	486204	489000	491007	494760	497546
##	[708]	498000	499003	503400	505440	505680	512521	519135
##	[715]	524000	525000	526785	528511	534351	538626	540229
##	[722]	542797	543620	544000	546270	546417	549963	557000
##	[729]	559042	559260	569890	574300	574696	576604	584548
##	[736]	586418	589599	594009	600000	601357	606674	607342
##	[743]	613987	622786	622914	630500	632500	639990	647267
##	[750]	648920	649410	650000	651700	653652	676000	677500
##	[757]	680000	685221	685540	697767	700400	701151	704700
##	[764]	711244	712000	715990	720160	721500	727351	727820
##	[771]	729270	737678	741575	746100	747610	753458	754060
##	[778]	758539	758720	758800	760400	767567	773000	776469
##	[785]	777960	782723	783080	787000	792540	795005	806600
##	[792]	814313	816300	818830	819087	822000	830160	835638
##	[799]	837479	851750	856198	861218	866520	867092	868689

##	[806]	869440	874624	879136	881265	884000	899530	909406
##	[813]	911600	912867	915600	924760	930663	934700	936227
##	[820]	936379	936540	939616	946880	950000	957312	960500
##	[827]	963099	965500	968865	972160	976398	980470	982000
##	[834]	985500	998800	1004760	1014750	1024705	1027748	1029295
##	[841]	1047752	1049187	1052000	1057208	1065199	1084191	1087362
##	[848]	1105222	1111226	1113440	1113878	1115168	1116773	1121187
##	[855]	1127774	1130000	1138738	1157682	1160360	1162416	1169246
##	[862]	1169975	1183000	1183450	1187918	1191500	1197574	1198000
##	[869]	1200000	1208400	1213000	1216107	1222699	1230057	1231401
##	[876]	1236000	1248000	1250799	1256930	1260070	1262600	1267291
##	[883]	1285590	1288100	1288140	1294070	1295000	1300000	1306920
##	[890]	1308114	1310808	1313600	1314733	1318658	1324373	1327363
##	[897]	1332121	1334000	1336791	1340000	1349526	1350422	1357950
##	[904]	1359175	1362730	1363314	1372707	1374000	1375987	1393749
##	[911]	1395400	1400000	1400596	1402925	1408027	1408597	1413000
##	[918]	1415422	1421116	1445671	1447900	1448959	1467000	1471479
##	[925]	1476000	1478349	1480069	1487128	1495578	1504181	1514468
##	[932]	1530971	1535010	1539364	1539791	1548350	1565906	1573438
##	[939]	1580712	1580920	1601000	1605770	1612530	1614700	1639815
##	[946]	1651066	1656600	1658000	1660967	1661374	1662483	1677360
##	[953]	1680548	1693000	1693277	1701798	1711482	1711549	1730390
##	[960]	1733968	1738800	1739655	1754579	1772369	1777899	1780836
##	[967]	1783860	1786000	1796004	1807362	1808050	1812203	1824570
##	[974]	1826997	1832130	1837275	1842825	1853000	1859593	1865944
##	[981]	1877766	1879020	1889000	1890213	1890680	1902333	1907000
##	[988]	1917880	1927108	1928160	1933395	1939520	1940779	1946500
##	[995]	1955305	1972951	1974000	1976040	1986000	1986800	1986810
##	[1002]	1987185	1988372	1994293	1997000	2010728	2012850	2017690
##	[1009]	2063280	2064960	2069282	2075520	2114485	2118674	2131200
##	[1016]	2131914	2146317	2159140	2159999	2172390	2199998	2205650
##	[1023]	2215305	2232000	2235307	2237250	2243564	2252712	2256319
##	[1030]	2256800	2258300	2262800	2264441	2268816	2269000	2273864
##	[1037]	2274495	2281310	2286480	2286840	2292500	2317000	2338758
##	[1044]	2342275	2358273	2361557	2400000	2430640	2455000	2470035
##	[1051]	2473040	2474700	2488600	2490952	2498000	2499998	2502000
##	[1058]	2506636	2507639	2508854	2513727	2535249	2545924	2552070
##	[1065]	2558000	2561541	2563326	2566200	2585900	2601642	2604980
##	[1072]	2611800	2615347	2617319	2620600	2635093	2635300	2660210
##	[1079]	2675520	2681122	2698123	2705243	2709383	2710305	2726858
##	[1086]	2730140	2746709	2751320	2755107	2773500	2773506	2781134
##	[1093]	2797212	2811000	2816080	2830080	2836440	2837354	2849420
##	[1100]	2852040	2852678	2854407	2863590	2865567	2867533	2868990
##	[1107]	2873329	2888520	2891500	2903000	2904585	2915103	2925500
##	[1114]	2927790	2935356	2936500	2938560	2939472	2944000	2964542
##	[1121]	2965092	2975133	2976874	2981878	2999997	3000000	3009808
##	[1128]	3033100	3051167	3054651	3065206	3076314	3076927	3086654
##	[1135]	3089578	3093159	3097950	3098330	3098500	3115606	3131997
##	[1142]	3149465	3157420	3161071	3161160	3166695	3172884	3183795
##	[1149]	3210000	3224000	3228666	3239450	3240433	3253000	3264691
##	[1156]	3270910	3282980	3288527	3306270	3318141	3333509	3333827
##	[1163]	3335763	3347189	3348892	3363420	3391078	3416610	3426585
##	[1170]	3431933	3435000	3444889	3455264	3462438	3468156	3479050
##	[1177]	3486468	3490253	3502171	3513400	3514394	3519138	3529605

## [1184]	3541860	3542240	3553010	3554658	3590168	3598539	3603000
## [1191]	3623033	3625110	3643913	3655897	3668638	3677987	3704340
## [1198]	3705196	3710000	3713291	3716900	3738694	3742881	3764159
## [1205]	3771380	3794484	3805865	3807000	3819633	3836000	3851060
## [1212]	3855152	3888684	3891350	3899119	3900000	3909470	3925741
## [1219]	3935900	3939505	3949249	3955200	3956900	3962924	3979000
## [1226]	3986493	3997800	4001400	4018700	4025690	4031299	4042145
## [1233]	4057108	4070200	4098533	4101842	4103723	4106886	4122440
## [1240]	4122960	4125000	4132500	4142546	4150307	4152993	4154923
## [1247]	4166894	4168814	4169858	4188925	4232956	4235925	4250920
## [1254]	4258941	4293224	4295000	4306560	4307433	4307600	4308416
## [1261]	4323418	4342197	4347000	4359705	4367880	4381213	4384058
## [1268]	4392100	4403670	4406616	4410722	4422378	4429920	4437525
## [1275]	4444851	4466000	4468908	4475220	4478143	4488350	4510880
## [1282]	4519352	4522160	4526802	4527237	4544945	4551334	4553806
## [1289]	4565000	4573565	4574351	4581948	4614100	4614720	4624128
## [1296]	4637480	4662971	4672010	4676866	4682900	4683698	4700000
## [1303]	4703433	4731595	4777340	4780328	4783315	4804803	4816793
## [1310]	4824090	4854560	4855425	4865340	4891200	4892500	4898300
## [1317]	4900000	4907725	4919650	4936833	4950279	4962000	5002500
## [1324]	5009750	5017153	5077980	5094592	5100000	5125000	5180559
## [1331]	5184852	5232118	5242544	5287242	5288450	5292850	5308380
## [1338]	5329016	5352920	5357360	5367889	5384000	5394257	5424155
## [1345]	5447596	5447857	5554000	5623798	5624825	5662283	5667984
## [1352]	5702750	5704366	5711560	5728400	5729956	5800000	5803034
## [1359]	5853578	5871027	5873280	5896410	5898921	5906662	5934500
## [1366]	5948011	5956471	5979500	5989515	5989532	5997430	6011123
## [1373]	6020800	6038000	6044752	6063779	6064100	6078400	6080800
## [1380]	6091165	6091621	6093348	6098300	6119143	6124531	6138983
## [1387]	6151533	6189000	6206119	6209779	6225920	6252750	6272300
## [1394]	6279141	6285258	6303993	6304622	6330000	6362928	6382300
## [1401]	6397701	6403059	6404458	6408536	6410000	6433500	6445987
## [1408]	6464010	6485239	6504238	6521083	6526613	6548714	6587486
## [1415]	6611410	6621510	6629941	6632591	6644938	6652741	6657000
## [1422]	6669095	6674128	6719485	6730375	6733738	6779700	6779963
## [1429]	6821354	6855000	6869052	6876100	6884000	6890909	6907450
## [1436]	6921580	6923500	6954849	6996880	7027742	7036810	7066031
## [1443]	7079273	7093000	7100000	7121814	7128757	7133814	7134892
## [1450]	7159892	7167587	7211000	7218442	7243700	7285380	7300880
## [1457]	7377600	7398104	7406710	7407107	7408000	7432920	7439871
## [1464]	7462967	7478800	7484946	7513167	7520095	7526165	7542136
## [1471]	7554920	7563983	7566370	7571947	7610420	7630100	7641386
## [1478]	7662642	7664397	7668000	7680210	7714093	7734793	7739016
## [1485]	7804437	7811791	7833833	7842641	7843845	7863000	7885123
## [1492]	7909604	7933826	7964760	7985663	7998500	8003882	8004439
## [1499]	8029336	8040827	8053776	8064826	8100650	8107212	8110359
## [1506]	8113115	8131460	8139550	8149719	8170818	8179873	8204821
## [1513]	8222233	8253563	8271850	8280300	8295758	8301840	8334760
## [1520]	8359029	8392007	8416821	8424299	8437963	8487851	8488651
## [1527]	8493771	8495449	8511300	8524160	8552839	8601056	8648544
## [1534]	8648876	8654360	8662283	8664396	8697982	8714810	8716385
## [1541]	8722040	8723353	8727750	8730983	8739903	8746666	8765444
## [1548]	8773090	8780641	8801639	8819423	8865270	8867546	8872452
## [1555]	8882912	8929331	8938935	8943266	8948500	8978500	9011675

## [1562]	9033088	9123319	9153179	9252868	9263964	9293000	9307500
## [1569]	9335680	9344537	9467466	9525108	9561000	9576225	9626041
## [1576]	9635980	9651000	9720100	9747250	9754560	9757747	9825986
## [1583]	9845202	9851306	9865000	9868484	9874700	9875230	9903000
## [1590]	9904406	9953669	9958686	9961179	9992400	10021758	10035047
## [1597]	10150510	10171330	10176670	10232470	10280735	10340024	10372048
## [1604]	10415170	10446458	10452600	10471712	10476421	10487280	10531961
## [1611]	10552773	10570926	10580420	10593255	10625781	10682948	10696019
## [1618]	10839535	10866560	10936461	10986230	10998400	11021650	11045250
## [1625]	11078173	11183600	11212975	11215247	11222901	11249499	11312510
## [1632]	11344499	11346000	11354910	11406000	11409800	11419245	11427907
## [1639]	11432084	11452100	11477020	11550840	11555000	11624696	11711066
## [1646]	11728799	11762314	11967671	12031782	12065950	12136581	12225479
## [1653]	12341457	12353325	12364770	12378600	12390965	12518374	12666130
## [1660]	12698715	12701040	12732700	12736825	12798354	12830327	12996000
## [1667]	13001607	13123139	13133239	13150670	13256330	13380831	13415462
## [1674]	13416266	13556620	13585000	13679426	13762585	13969532	13973291
## [1681]	13994835	14059050	14197856	14251002	14273550	14418100	14552950
## [1688]	14578660	14609098	14667439	14669841	14886320	14949764	15020452
## [1695]	15029280	15096666	15121173	15150266	15382676	15511805	15516103
## [1702]	15587652	15624860	15796983	16170219	16191000	16266101	16458311
## [1709]	16521997	16649719	16879326	16989531	17016099	17034849	17048745
## [1716]	17146838	17316559	17319639	17356386	17437387	17546120	17631097
## [1723]	17829965	17889480	17967000	18155042	18470398	18516094	18595935
## [1730]	18614680	18822682	18867000	19003080	19180047	19334118	19439860
## [1737]	19623840	19751186	19798540	20097739	20203471	20231080	20532249
## [1744]	20574501	20627484	20641540	20896200	20899522	21180551	21257472
## [1751]	21346550	21407729	21420596	21446333	21554382	21788872	21812609
## [1758]	21937059	21984877	22598100	22731079	22761920	22762053	23217353
## [1765]	23290887	23296160	23532720	23585121	23881200	24049800	24080014
## [1772]	24156800	24291100	24346000	24665560	24867812	24946450	24958842
## [1779]	25007040	25077176	25233478	25444526	25537066	25571687	25659000
## [1786]	25659609	25921856	25934561	25963843	26026922	26057640	26316757
## [1793]	26417319	26431104	26698560	27392300	27579681	27618798	27677391
## [1800]	27866921	27973830	28044812	28166330	28286950	28864199	28880553
## [1807]	29036215	29078300	29253960	29470753	29701787	30029122	30108152
## [1814]	30980000	31507995	31510692	31630111	31986560	32225158	32402646
## [1821]	32575450	32627326	32993696	33118261	33280506	33291760	33302540
## [1828]	33756907	34100000	34271000	34400709	34409552	34508703	34539629
## [1835]	34727300	34819831	35332102	35949899	35958000	36380000	36631210
## [1842]	36748102	36828500	37050000	37121529	37216775	37239888	37249500
## [1849]	37293803	37464150	37545548	37919459	38159809	38511421	38511767
## [1856]	38955930	38957273	39122878	39196664	39703750	39808773	39860991
## [1863]	39996945	40488807	40989298	41606496	41626200	41734851	42091117
## [1870]	42171769	42399613	42458524	42875006	42889800	43148540	43475937
## [1877]	43939194	44023361	44038540	44111544	44270236	44618413	44747150
## [1884]	44910647	45065360	45233457	45424648	45798549	45845588	45953201
## [1891]	46481754	46482480	47010307	47010884	47094083	47348064	47520102
## [1898]	47538860	47688800	47718067	47914284	48018881	48144033	48498500
## [1905]	48605000	48669553	48759207	48806121	48834047	48854380	48904250
## [1912]	48955835	49263092	49263166	49292140	49349737	50138530	50346000
## [1919]	50587120	50654152	51058998	53515733	54270480	54399203	55564014
## [1926]	56317628	56327135	56552000	56991959	57075186	57417016	57550000
## [1933]	57645720	57827992	58136180	59509308	60917960	61415885	62557600

```
## [1940] 63095110 63127199 63606575 63749979 64726375 65340680 65757632
## [1947] 68566005 70501062 70508000 70771650 70935420 71553248 73102643
## [1954] 73529400 74134211 75435002 75625755 76584168 77767360 78030424
## [1961] 80576608 80606800 84493445 86109120 87909596 94526013 95812392
## [1968] 97293942 103229800 105697556 105985210 106775993 108811290 110265118
## [1975] 117027504 122994019 129071456 134001770 138033011 146447175 150234347
## [1982] 151406004 157380092 167515758 168313010 172867051 182810532 186649864
## [1989] 199787782 214425162 215593975 219818305 226464805
```

#Write a function that lists all the unique years with more than 300,000 Christians in total

```
funthree <- function(d,x,y){
  funq <- as.data.frame(d[x>300000, y])
  unq <- unique(f)
  return(u)
}
```

#As discussed in class, return is not necessary

Loops/apply

#Write a loop to find how many variables there are per observation

#Write a loop to find the mean number of Protestant Christians in each country (i.e., the state column)

#Check the column type for each variable