

Question 1

```
z <- read.table("/Users/irenecho/Desktop/stat443/datafiles/cedata.txt",header=TRUE)
w <- z$FINLWT21 ### sampling weights

zclass <- read.table("/Users/irenecho/Desktop/stat443/datafiles/gf.prp",header=TRUE)
probmissing <- zclass[,2] ### estimated P(INTRDVX_ = C)
p <- 1-probmissing
p
```

```
## [1] 0.743350 0.720000 0.870260 0.813300 0.844680 0.776600 0.427500 0.560390
## [9] 0.799860 0.857240 0.457970 0.707110 0.599120 0.668070 0.733360 0.783430
## [17] 0.372870 0.831960 0.085050 0.233480 0.888240 0.794830 0.821500 0.479880
## [25] 0.608300 0.681160 0.137320 0.083850 0.796900 0.506360 0.450160 0.460270
## [33] 0.454560 0.793080 0.722740 0.630990 0.707520 0.577760 0.577980 0.636020
## [41] 0.832040 0.795690 0.884460 0.749170 0.621550 0.794080 0.644090 0.438500
## [49] 0.833730 0.434290 0.733220 0.771810 0.865800 0.785750 0.475940 0.867980
## [57] 0.860120 0.526170 0.776820 0.678250 0.651910 0.495960 0.448060 0.396390
## [65] 0.147540 0.763160 0.765700 0.655330 0.632230 0.093170 0.835650 0.856180
## [73] 0.826950 0.801100 0.865600 0.643330 0.178650 0.649120 0.578260 0.734380
## [81] 0.773030 0.711980 0.558590 0.485350 0.781400 0.385580 0.111380 0.631280
## [89] 0.828220 0.455440 0.608310 0.628560 0.612390 0.767210 0.857930 0.775400
## [97] 0.189150 0.666600 0.712460 0.891040 0.863710 0.393110 0.704000 0.718910
## [105] 0.338340 0.401570 0.828870 0.861760 0.610230 0.752700 0.600540 0.364250
## [113] 0.879600 0.784330 0.872050 0.571140 0.433050 0.119210 0.709390 0.627270
## [121] 0.527690 0.610730 0.640740 0.818410 0.456230 0.652310 0.882070 0.546370
## [129] 0.502810 0.743500 0.719590 0.811000 0.632750 0.582450 0.813530 0.713640
## [137] 0.725910 0.096980 0.410090 0.442780 0.425900 0.467210 0.693630 0.680250
## [145] 0.572880 0.715800 0.312710 0.750910 0.911656 0.824340 0.751820 0.772140
## [153] 0.535260 0.580650 0.649560 0.884260 0.793920 0.128800 0.726820 0.582960
## [161] 0.092640 0.766920 0.632870 0.837750 0.616870 0.117630 0.839540 0.484730
## [169] 0.802950 0.616580 0.579300 0.265330 0.398870 0.644010 0.850410 0.746230
## [177] 0.720300 0.637840 0.703880 0.313540 0.916873 0.570920 0.819270 0.709130
## [185] 0.802580 0.460170 0.500000 0.869650 0.688410 0.613340 0.690650 0.772670
## [193] 0.275620 0.849740 0.726120 0.834620 0.548060 0.715630 0.790660 0.742080
## [201] 0.821660 0.599580 0.640890 0.731350 0.783620 0.744240 0.037940 0.736350
## [209] 0.680750 0.770160 0.515230 0.657310 0.710800 0.635400 0.843990 0.398570
## [217] 0.831020 0.600610 0.794380 0.044890 0.752670 0.735270 0.520540 0.860500
## [225] 0.863760 0.736960 0.232390 0.855630 0.578730 0.785600 0.453440 0.519250
## [233] 0.155950 0.470270 0.871440 0.521540 0.343920 0.833720 0.695620 0.303350
## [241] 0.785260 0.436880 0.700350 0.794460 0.686690 0.528890 0.862200 0.579120
## [249] 0.337810 0.635130 0.427680 0.901537 0.308440 0.830780 0.463900 0.805100
## [257] 0.196160 0.417080 0.707460 0.701910 0.787450 0.874830 0.228300 0.730620
## [265] 0.875950 0.587940 0.841110 0.826080 0.765440 0.511020 0.893250 0.458180
## [273] 0.183490 0.318540 0.070240 0.476840 0.453640 0.614800 0.626680 0.847760
## [281] 0.573880 0.579350 0.590610 0.793300 0.400450 0.781510 0.861310 0.697560
## [289] 0.355380 0.727060 0.469550 0.370980 0.689200 0.587480 0.354950 0.922199
## [297] 0.874880 0.819200 0.653790 0.351560 0.833840 0.480420 0.661620 0.776100
## [305] 0.381530 0.423380 0.894340 0.828110 0.729910 0.174520 0.710780 0.589940
## [313] 0.712350 0.542420 0.855870 0.774780 0.473400 0.806370 0.656810 0.852950
## [321] 0.732330 0.699290 0.637040 0.746450 0.530800 0.743680 0.607550 0.133230
## [329] 0.835670 0.890240 0.785790 0.618760 0.823010 0.767290 0.405290 0.803780
## [337] 0.535970 0.633690 0.746630 0.544980 0.762450 0.701460 0.699230 0.041030
## [345] 0.642370 0.651030 0.671610 0.686390 0.218410 0.426440 0.713570 0.787180
## [353] 0.050330 0.484460 0.106570 0.825230 0.789740 0.652170 0.124540 0.860930
## [361] 0.505650 0.317310 0.721550 0.703360 0.310000 0.528180 0.516750 0.696750
## [369] 0.391070 0.362110 0.486920 0.385060 0.844190 0.362630 0.111200 0.304930
## [377] 0.594920 0.686020 0.743830 0.772680 0.845760 0.746610 0.652480 0.112820
## [385] 0.634030 0.840770 0.554680 0.777010 0.429000 0.439410 0.656510 0.328070
## [393] 0.612700 0.636050 0.801250 0.581250 0.555640 0.084540 0.058980 0.054170
## [401] 0.707010 0.606970 0.647890 0.798240 0.209330 0.600870 0.501280 0.452740
## [409] 0.683850 0.673140 0.662080 0.808610 0.817720 0.565540 0.515860 0.558020
## [417] 0.720380 0.207560 0.745740 0.432810 0.399280 0.311920 0.546920 0.655210
```

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## [425] 0.854480 0.589500 0.673680 0.567570 0.730760 0.447260 0.810290 0.738350
## [433] 0.591140 0.046830 0.596560 0.658910 0.893220 0.052340 0.696440 0.123750
## [441] 0.563850 0.515830 0.852110 0.342020 0.229010 0.629790 0.754380 0.743900
## [449] 0.052100 0.759970 0.684650 0.337840 0.154400 0.698600 0.678300 0.710150
## [457] 0.593340 0.634690 0.415270 0.861310 0.812390 0.842860 0.742350 0.570870
## [465] 0.689660 0.519720 0.716670 0.561120 0.604780 0.735310 0.680390 0.548840
## [473] 0.729630 0.865370 0.207830 0.860990 0.862730 0.216880 0.752700 0.818750
## [481] 0.197510 0.306450 0.758300 0.827400 0.503800 0.349900 0.427120 0.880190
## [489] 0.712250 0.351250 0.696650 0.641360 0.784240 0.825170 0.608050 0.719360
## [497] 0.783100 0.820530 0.666450 0.486130 0.821300 0.079380 0.652250 0.515940
## [505] 0.767850 0.729730 0.679560 0.670010 0.477180 0.713160 0.427160 0.756700
## [513] 0.624910 0.069040 0.610820 0.743600 0.484940 0.825180 0.397050 0.805970
## [521] 0.768310 0.765180 0.336180 0.830920 0.357500 0.332400 0.057590 0.815240
## [529] 0.739490 0.217050 0.366550 0.123710 0.754840 0.768800 0.527380 0.504650
## [537] 0.845270 0.800730 0.846680 0.617410 0.064390 0.314940 0.371600 0.844550
## [545] 0.643130 0.821200 0.808880 0.772200 0.175630 0.707360 0.523360 0.225160
## [553] 0.563510 0.713200 0.496330 0.794920 0.763060 0.520300 0.828490 0.486900
## [561] 0.126600 0.522090 0.506170 0.175550 0.692100 0.359390 0.503670 0.853920
## [569] 0.658310 0.314730 0.763020 0.362320 0.539510 0.652090 0.840720 0.113420
## [577] 0.152980 0.673550 0.611270 0.720910 0.733110 0.530310 0.505830 0.419870
## [585] 0.566850 0.799410 0.710440 0.857740 0.702720 0.830840 0.499390 0.656340
## [593] 0.683670 0.851610 0.465410 0.674360 0.728570 0.662090 0.337410 0.632290
## [601] 0.795310 0.791190 0.705710 0.615450 0.771210 0.751190 0.518120 0.402270
## [609] 0.797100 0.508440 0.165130 0.633460 0.703440 0.714050 0.602350 0.588230
## [617] 0.565780 0.705270 0.088130 0.424330 0.309900 0.730800 0.796390 0.059160
## [625] 0.604490 0.544830 0.403830 0.808050 0.815380 0.371840 0.303750 0.488330
## [633] 0.610500 0.782370 0.660780 0.518670 0.661070 0.535300 0.331320 0.810380
## [641] 0.425750 0.495340 0.426480 0.472750 0.494890 0.835850 0.346070 0.833520
## [649] 0.372310 0.624910 0.577290 0.845260 0.833040 0.638770 0.725260 0.517050
## [657] 0.365490 0.849540 0.436130 0.823970 0.782470 0.468810 0.181780 0.575440
## [665] 0.689750 0.743310 0.765360 0.418180 0.662920 0.860040 0.698380 0.080180
## [673] 0.780140 0.208470 0.598340 0.489040 0.599190 0.805540 0.664010 0.383520
## [681] 0.476270 0.552090 0.765610 0.696570 0.710650 0.868250 0.718900 0.854500
## [689] 0.782270 0.552590 0.826270 0.679630 0.825730 0.616380 0.851100 0.425350
## [697] 0.466070 0.760800 0.858950 0.803900 0.858220 0.731380 0.503740 0.780990
## [705] 0.492300 0.586820 0.472800 0.776120 0.655490 0.565820 0.794000 0.366890
## [713] 0.726150 0.634610 0.594340 0.625360 0.090800 0.677400 0.679290 0.780110
## [721] 0.826900 0.752430 0.820560 0.771070 0.698090 0.811680 0.557040 0.851480
## [729] 0.826620 0.774440 0.408400 0.859220 0.438670 0.467700 0.754200 0.734540
## [737] 0.711080 0.422550 0.785210 0.666050 0.397150 0.778990 0.398690 0.464160
## [745] 0.415130 0.857620 0.795370 0.259420 0.532020 0.718270 0.567390 0.491190
## [753] 0.402920 0.590770 0.378580 0.856290 0.502090 0.702570 0.653330 0.489230
## [761] 0.358230 0.448640 0.134370 0.724500 0.802380 0.450750 0.292040 0.395240
## [769] 0.629130 0.668800 0.883490 0.388190 0.796460 0.818830 0.480840 0.357740
## [777] 0.320470 0.640050 0.863180 0.657480 0.861310 0.074370 0.698020 0.748020
## [785] 0.406690 0.455530 0.735530 0.720930 0.741030 0.852280 0.241260 0.750950
## [793] 0.895070 0.525010 0.151560 0.382790 0.534230 0.750670 0.561310 0.500690
## [801] 0.364900 0.677180 0.264530 0.618490 0.832640 0.420050 0.138240 0.559310
## [809] 0.550420 0.800630 0.871410 0.579930 0.472560 0.770470 0.498830 0.546230
## [817] 0.629690 0.832680 0.132540 0.273630 0.698900 0.802710 0.349650 0.047030
## [825] 0.342690 0.500610 0.565700 0.837540 0.389900 0.584210 0.470830 0.817830
## [833] 0.600350 0.834220 0.884480 0.313240 0.824210 0.826780 0.768460 0.636240
## [841] 0.600640 0.670150 0.549110 0.850380 0.113050 0.875080 0.776660 0.366910
## [849] 0.809010 0.734070 0.324770 0.832060 0.742110 0.874660 0.777450 0.677150
```

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## [857] 0.154230 0.773770 0.223210 0.786280 0.813780 0.749970 0.304330 0.845770
## [865] 0.560680 0.869120 0.660100 0.570540 0.543270 0.460250 0.610010 0.825420
## [873] 0.817180 0.426520 0.692170 0.746280 0.741880 0.847570 0.782870 0.872030
## [881] 0.798750 0.416110 0.892880 0.747670 0.633660 0.696570 0.798300 0.193670
## [889] 0.198900 0.699660 0.715470 0.110810 0.479850 0.694010 0.440220 0.759680
## [897] 0.780980 0.812950 0.847000 0.457720 0.842080 0.732320 0.773970 0.748780
## [905] 0.728670 0.840560 0.895330 0.910441 0.804790 0.751100 0.568570 0.696710
## [913] 0.512060 0.667130 0.706400 0.460180 0.047310 0.691500 0.893460 0.343290
## [921] 0.805640 0.790260 0.461520 0.390530 0.850480 0.771000 0.756390 0.662550
## [929] 0.806190 0.556670 0.738340 0.571950 0.723150 0.079110 0.815890 0.367790
## [937] 0.209260 0.682840 0.436460 0.689860 0.622920 0.771440 0.354560 0.145670
## [945] 0.818080 0.455160 0.219190 0.708360 0.614790 0.794450 0.227480 0.780680
## [953] 0.715180 0.461190 0.852950 0.675670 0.525290 0.745340 0.302920 0.698970
## [961] 0.544350 0.770550 0.865470 0.411270 0.843540 0.542300 0.075080 0.133220
## [969] 0.848580 0.787450 0.075190 0.632200 0.556080 0.781790 0.345990 0.750130
## [977] 0.635330 0.056860 0.604410 0.757010 0.449930 0.799090 0.723360 0.854000
## [985] 0.499450 0.663200 0.572400 0.170850 0.912156 0.389430 0.371090 0.810780
## [993] 0.782940 0.767960 0.489220 0.814450 0.745010 0.799560 0.833120 0.841900
## [1001] 0.467000 0.812640 0.839950 0.672790 0.791700 0.577230 0.469210 0.875870
## [1009] 0.777570 0.759290 0.352380 0.867870 0.814490 0.349720 0.751460 0.553050
## [1017] 0.683060 0.447610 0.846850 0.303480 0.552640 0.902224 0.363910 0.627470
## [1025] 0.818780 0.805050 0.429260 0.774330 0.761760 0.488460 0.059730 0.399600
## [1033] 0.827300 0.493340 0.770070 0.858650 0.524520 0.141840 0.842450 0.369130
## [1041] 0.809640 0.571640 0.356140 0.775450 0.781120 0.527380 0.811690 0.809810
## [1049] 0.477030 0.154000 0.778270 0.735830 0.659650 0.308060 0.443280 0.500530
## [1057] 0.739910 0.576290 0.048880 0.475930 0.733190 0.771670 0.796590 0.601340
## [1065] 0.628800 0.855660 0.714900 0.132460 0.639920 0.872220 0.609640 0.883840
## [1073] 0.717120 0.151020 0.341630 0.366860 0.530770 0.155190 0.060370 0.076320
## [1081] 0.550360 0.681370 0.736730 0.160410 0.762700 0.880090 0.492060 0.787320
## [1089] 0.817250 0.417170 0.781110 0.661900 0.734910 0.846670 0.752340 0.463620
## [1097] 0.564570 0.330510 0.434980 0.759400 0.320790 0.739000 0.819640 0.650370
## [1105] 0.070420 0.537160 0.802570 0.822320 0.757600 0.474350 0.439370 0.366270
## [1113] 0.816400 0.713420 0.858860 0.607360 0.409160 0.388070 0.885960 0.175670
## [1121] 0.463830 0.589210 0.308670 0.515890 0.908546 0.835270 0.836440 0.727060
## [1129] 0.785850 0.897810 0.201990 0.720860 0.791120 0.884710 0.774990 0.494990
## [1137] 0.071770 0.858240 0.664480 0.715970 0.871610 0.744790 0.357170 0.840040
## [1145] 0.398190 0.806300 0.870690 0.730520 0.334010 0.843020 0.440920 0.784140
## [1153] 0.837660 0.336350 0.530000 0.251840 0.802400 0.190350 0.657940 0.427500
## [1161] 0.799110 0.842610 0.922992 0.056590 0.862700 0.744240 0.320710 0.807410
## [1169] 0.344460 0.302200 0.794900 0.733340 0.385390 0.798440 0.635790 0.859120
## [1177] 0.427760 0.332080 0.107620 0.808460 0.482770 0.789610 0.838920 0.903268
## [1185] 0.785240 0.412110 0.782740 0.918961 0.775180 0.765090 0.725490 0.711640
## [1193] 0.746410 0.427970 0.780270 0.780610 0.617900 0.865140 0.262590 0.391240
## [1201] 0.797620 0.269100 0.860270 0.923984 0.860350 0.862640 0.746810 0.743730
## [1209] 0.828200 0.663180 0.796530 0.778560 0.307050 0.832790 0.552650 0.901299
## [1217] 0.164780 0.331530 0.179830 0.757260 0.071930 0.367430 0.291800 0.817070
## [1225] 0.749510 0.849180 0.830750 0.816650 0.485490 0.835990 0.383240 0.841560
## [1233] 0.383690 0.851350 0.880110 0.502950 0.906420 0.763620 0.778240 0.387990
## [1241] 0.660600 0.809930 0.733510 0.811210 0.539050 0.767550 0.758810 0.854510
## [1249] 0.554840 0.261950 0.485120 0.863620 0.863240 0.835230 0.742890 0.795220
## [1257] 0.913830 0.361500 0.827670 0.047740 0.633950 0.880130 0.787690 0.856840
## [1265] 0.669200 0.750590 0.762880 0.791010 0.345740 0.725870 0.771510 0.382650
## [1273] 0.828090 0.765700 0.570250 0.459870 0.786890 0.570260 0.027790 0.420030
## [1281] 0.878800 0.782740 0.881080 0.415350 0.262740 0.764050 0.826460 0.861560
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## [1289] 0.056350 0.091580 0.762330 0.325880 0.725180 0.061380 0.045720 0.725270
## [1297] 0.385220 0.742760 0.820580 0.484480 0.808520 0.855000 0.194220 0.116210
## [1305] 0.806120 0.415560 0.821900 0.750530 0.542890 0.274070 0.097030 0.813310
## [1313] 0.236310 0.701060 0.094640 0.813140 0.713550 0.663440 0.391200 0.712820
## [1321] 0.858730 0.405650 0.148410 0.879240 0.328720 0.608580 0.771320 0.462500
## [1329] 0.880620 0.714450 0.413060 0.791590 0.481350 0.793610 0.745810 0.881610
## [1337] 0.844640 0.227290 0.657900 0.701330 0.700580 0.778140 0.295980 0.598250
## [1345] 0.811500 0.769410 0.881390 0.929860 0.779660 0.827090 0.772680 0.775040
## [1353] 0.723100 0.841930 0.077490 0.613650 0.752690 0.430380 0.879080 0.758190
## [1361] 0.783900 0.596960 0.125060 0.731010 0.211530 0.075780 0.661100 0.808500
## [1369] 0.270170 0.628660 0.678980 0.777050 0.808850 0.775500 0.767530 0.719700
## [1377] 0.316780 0.785410 0.865520 0.517900 0.752320 0.782370 0.860810 0.916690
## [1385] 0.688110 0.517340 0.879910 0.866920 0.563390 0.882990 0.332440 0.643070
## [1393] 0.385820 0.708170 0.830730 0.787860 0.674120 0.715710 0.762930 0.701280
## [1401] 0.412000 0.095330 0.601820 0.608540 0.575960 0.701830 0.853830 0.883930
## [1409] 0.419460 0.442090 0.452500 0.719330 0.780240 0.873760 0.641230 0.797500
## [1417] 0.791390 0.460670 0.934423 0.889610 0.635790 0.848170 0.507160 0.786650
## [1425] 0.732620 0.669100 0.838610 0.783910 0.557540 0.057700 0.062490 0.098160
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## [4289] 0.707590 0.865730 0.760770 0.796190 0.851380 0.867370 0.836390 0.766030
## [4297] 0.529990 0.773860 0.517590 0.804350 0.909525 0.841650 0.822840 0.449320
## [4305] 0.871990 0.745590 0.760780 0.768550 0.848690 0.404100 0.828250 0.710380
```

```
## [4313] 0.783980 0.561180 0.580900 0.643950 0.922710 0.857130 0.801660 0.183590
## [4321] 0.822130 0.884380 0.103780 0.566930 0.404630 0.840230 0.731510 0.446130
## [4329] 0.734070 0.852870 0.875220 0.610380 0.764110 0.710570 0.826170 0.696490
## [4337] 0.715290 0.447580 0.760580 0.570710 0.130620 0.332620 0.133490 0.758300
## [4345] 0.898030 0.798810 0.915229 0.651660 0.703140 0.485050 0.669890 0.883970
## [4353] 0.544730 0.904688 0.741070 0.687880 0.382770 0.178700 0.806240 0.480860
## [4361] 0.823350 0.688630 0.447910 0.770300 0.204270 0.801330 0.362700 0.725260
## [4369] 0.771310 0.570580 0.508710 0.755130 0.783900 0.567520 0.571180 0.588950
## [4377] 0.623670 0.738280 0.504580 0.603270 0.635300 0.675220 0.648650 0.655040
## [4385] 0.770720 0.465320 0.037060 0.088170 0.576220 0.715630 0.714980 0.832160
## [4393] 0.690650 0.730980 0.574160 0.827400 0.661560 0.575690 0.443490 0.606390
## [4401] 0.652050 0.755930 0.707790 0.376660 0.816130 0.609220 0.800300 0.764090
## [4409] 0.244920 0.302910 0.704520 0.676560 0.929049 0.614230 0.774450 0.438900
## [4417] 0.767630 0.708140 0.435040 0.762430 0.813520 0.827000 0.413500 0.720660
## [4425] 0.758860 0.703560 0.794450 0.642350 0.562310 0.736590 0.746790 0.550600
## [4433] 0.779910 0.486470 0.615110 0.580450 0.780450 0.808870 0.534570 0.552330
## [4441] 0.543340 0.763000 0.476660 0.827800 0.730370 0.713640 0.542030 0.894780
## [4449] 0.649730 0.766700 0.516470 0.864690 0.876790 0.793590 0.790120 0.738580
## [4457] 0.665090 0.731790 0.664820 0.718650 0.737880 0.897160 0.718460 0.618920
## [4465] 0.840810 0.405850 0.480410 0.598660 0.871480 0.743110 0.579040 0.546820
## [4473] 0.633080 0.426230 0.795560 0.738160 0.616790 0.061140 0.299280 0.922408
## [4481] 0.804210 0.370830 0.145590 0.445300 0.741510 0.448470 0.446490 0.767210
## [4489] 0.609890 0.825880 0.574200 0.839490 0.728850 0.734680 0.538510 0.842820
## [4497] 0.575650 0.757980 0.889090 0.721030 0.655500 0.300430 0.622050 0.782050
## [4505] 0.360530 0.901051 0.721150 0.644570 0.262580 0.646100 0.588040 0.655610
## [4513] 0.377480 0.694990 0.592540 0.636880 0.708900 0.167520 0.709240 0.634040
## [4521] 0.513350 0.822100 0.841940 0.858150 0.510940 0.643060 0.717750 0.480210
## [4529] 0.651120 0.386570 0.583790 0.701530 0.760750 0.863670 0.088540 0.768130
## [4537] 0.724600 0.836740 0.625180 0.376540 0.755390 0.778560 0.823010 0.573870
## [4545] 0.814440 0.314710 0.646540 0.572810 0.716970 0.490540 0.940307 0.757100
## [4553] 0.888620 0.682990 0.826230 0.761680 0.862950 0.729710 0.721060 0.699030
## [4561] 0.617390 0.860650 0.211080 0.541480 0.493580 0.681660 0.501040 0.806890
## [4569] 0.665910 0.805240 0.488430 0.797410 0.605100 0.058370 0.503790 0.863590
## [4577] 0.358050 0.747120 0.072900 0.444650 0.881870 0.715430 0.513930 0.562920
## [4585] 0.685190 0.817250 0.686410 0.834110 0.910934 0.452760 0.417790 0.604960
## [4593] 0.665640 0.784090 0.639480 0.663130 0.749960 0.697910 0.797370 0.644840
## [4601] 0.317170 0.475400 0.719160 0.714820 0.719790 0.743120 0.849160 0.800000
## [4609] 0.729440 0.074000 0.442880 0.831660 0.804180 0.440420 0.148850 0.427900
## [4617] 0.726650 0.536750 0.846250 0.759840 0.421430 0.554760 0.570180 0.517750
## [4625] 0.736160 0.468180 0.654410 0.717700 0.091930 0.597910 0.493420 0.745600
## [4633] 0.805260 0.787520 0.731420 0.639530 0.734230 0.609110 0.165260 0.812950
## [4641] 0.064110 0.687890 0.890980 0.633230 0.674740 0.842050 0.812140 0.803470
## [4649] 0.794310 0.729600 0.773250 0.650950 0.661290 0.347650 0.800100 0.658870
## [4657] 0.568400 0.756190 0.059160 0.607750 0.141830 0.848710 0.755300 0.591840
## [4665] 0.580310 0.627310 0.669430 0.634240 0.691560 0.733590 0.798990 0.525980
## [4673] 0.740600 0.900726 0.346770 0.721000 0.667640 0.463830 0.581120 0.840290
## [4681] 0.336180 0.402850 0.813890 0.838050 0.823190 0.726660 0.383130 0.823960
## [4689] 0.447700 0.893780 0.873970 0.842120 0.878730
```

p in this code should be pi. In the lecture, the professor has mentioned that $1-p(c) = \pi$. Therefore, I have calculated 1-probmissing, where probmissing equals to p(c). The results for pi equals to the following numbers.

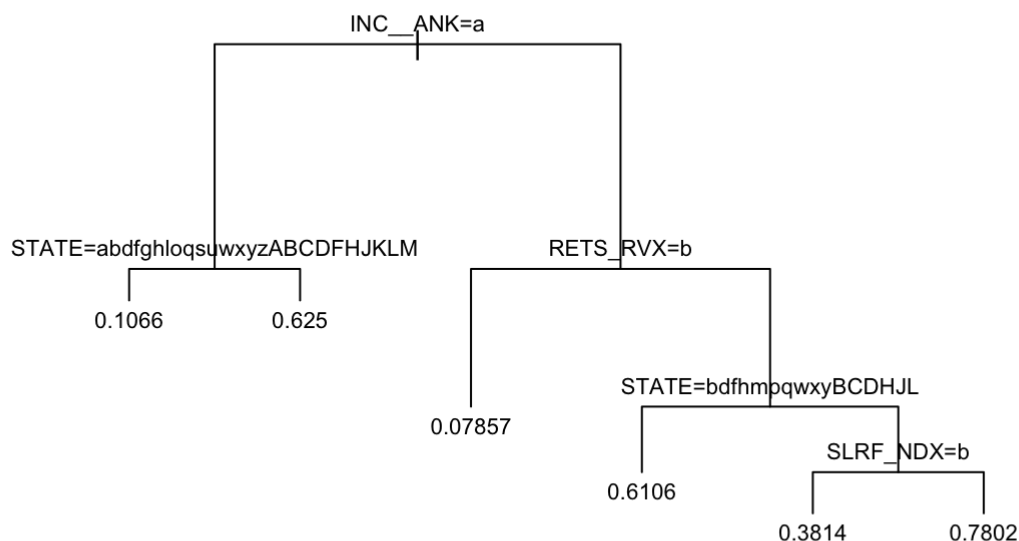
Question 2

```
library(rpart)
vartype <- rep("numeric",638)
vartype[c(1,2,4,6,8,10,12,14,16,18,20,22,23,24,25,26,27,29,31,33,34,35,37,39,41,43,45,47
,49,52,54,56,58,60,62,64,66,68,70,72,73,74,75,76,77,78,79,80,82,84,86,88,89,90,92,94,96,
97,98,99,100,102,104,106,108,109,110,111,112,113,114,115,116,118,119,120,122,123,124,125
,126,128,130,131,132,133,135,137,139,303,304,305,306,307,308,309,310,311,312,313,314,315
,316,317,318,319,321,323,325,331,333,407,409,410,411,453,454,456,458,460,462,464,465,466
,467,468,470,472,474,476,477,478,479,482,484,486,488,490,492,494,496,497,498,499,500,502
,504,506,508,510,512,514,516,518,520,522,524,526,528,530,532,534,536,538,540,542,544,546
,548,550,552,554,556,558,560,562,564,566,568,570,572,574,576,578,580,582,584,585,586,588
,590,592,594,596,598,600,602,604,606,608,610,612,614,616,618,620,622,624,626,628,630,632
,635,637)] <- "factor"

z <- read.table(file= "/Users/irenecho/Desktop/stat443/datafiles/subset.txt", header=TRUE, colClasses = vartype)
```

```
tmp <- rep(NA,nrow(z))
tmp[z$INTRDVX_ == "C"] <- 0
tmp[z$INTRDVX_ == "D" | z$INTRDVX_ == "T"] <- 1
z$INTRDVX_ <- tmp

### regression tree without INTRDVX and FINLWT21
rp <- rpart(INTRDVX_ ~ .- INTRDVX -FINLWT21, data=z, method="anova")
plot(rp,compress=TRUE,margin=0.1)
text(rp, cex=0.7)
```



```
p <- predict(rp) ### predicted prob(INTRDVX_ = 1)
w <- z$FINLWT21
y <- z$INTRDVX
gp <- !is.na(y)
ipw <- sum(w[gp]*y[gp]/p[gp])/sum(w[gp]/p[gp])
print(ipw)
```

```
## [1] 4442.648
```

The equation for IPW follows:

$$\left(\sum_{i \in S} w_i / \hat{p}_i\right)^{-1} \sum_{i \in S} w_i y_i / \hat{p}_i$$

I have used the R code presented in the ppt slide for the lecture. The estimated probability that INTRDVX does not equal to c, which is \hat{p}_i would equal to 4449.276 dollars.

Question 3

```
zreg <- read.table("/Users/irenecho/Desktop/stat443/datafiles/cereg1.fit",header=TRUE)
yhat <- zreg$predicted
yhat
```

##	[1]	2607.5880	1596.0370	851.2382	3468.4490	791.1154	35541.9800
##	[7]	3810.0330	5377.4570	955.9800	2165.3370	5400.2790	2876.3290
##	[13]	1981.0570	4367.7110	2483.8720	58172.5400	2662.2800	1204.2190
##	[19]	5767.5170	776.4293	839.3498	6354.3560	704.1825	1223.3080
##	[25]	4622.0750	13894.9600	2926.5970	3163.5070	9969.0340	2218.3900
##	[31]	5521.4430	5154.7560	7155.5350	3299.7260	3014.6190	4067.4400
##	[37]	1375.4320	9008.5380	2926.8240	3471.8900	6980.3570	3506.0290
##	[43]	1215.5870	1344.6020	4673.6510	562.2152	5552.3750	4405.3340
##	[49]	3759.1400	987.6847	14616.6700	1078.4970	2342.1340	14086.2500
##	[55]	1434.3420	1976.6770	2103.5860	2781.1880	1259.9860	8564.8830
##	[61]	3816.7830	20588.6600	3027.1170	1378.0090	997.7417	1400.0770
##	[67]	16763.3900	678.5838	29206.2200	4453.3150	2964.5110	2153.5570
##	[73]	2878.3920	1131.6880	2895.4650	4137.3330	7631.2820	7699.7230
##	[79]	937.3116	3416.6720	2160.7170	4210.3880	6475.4910	5337.5290
##	[85]	1550.6650	11172.8200	3479.1060	1938.4320	1121.9560	3262.3390
##	[91]	4151.4080	5600.7100	1658.0820	1769.2750	4952.8700	7154.2610
##	[97]	1157.1090	386.2221	743.4725	3415.8010	2510.7890	1621.9340
##	[103]	3604.4080	3393.3620	7472.4810	12591.4400	1683.3280	811.8619
##	[109]	1820.0450	4607.1840	14667.1900	9219.7030	2136.8170	1535.8370
##	[115]	1035.2310	3562.4430	13738.4800	5282.7060	2289.5800	1764.5550
##	[121]	3524.2560	1943.9300	6429.4410	4501.1290	2224.4260	1880.2150
##	[127]	2456.1920	2577.8060	826.5782	2525.2130	8348.4910	656.6443
##	[133]	5297.8110	4524.0140	1906.9230	1241.7160	1438.2370	6606.0940
##	[139]	1675.3580	13585.0100	8888.4820	1695.1130	5441.2910	1770.5620
##	[145]	10135.7900	5336.0120	10615.6100	5183.1490	265.4896	5883.3000
##	[151]	1624.4000	933.3452	30204.7300	15896.8200	3430.7490	3374.0840
##	[157]	2715.4210	7974.3630	1453.4730	1899.9950	3243.0980	10588.9100
##	[163]	5680.4740	1113.4510	4297.0380	2742.6960	2642.0400	1294.9220
##	[169]	3232.0710	6252.2330	2318.4300	27732.4100	1186.2030	1412.6580
##	[175]	1443.8750	850.2721	6177.1970	7639.3950	1564.0490	11166.2800
##	[181]	1379.5730	594.6189	885.3519	2212.0980	1304.0110	2908.9500
##	[187]	3952.4960	1288.6160	1968.4040	3688.3000	1976.8960	1269.3620
##	[193]	6208.5390	2533.7660	10319.2700	259.6740	2471.7580	1068.7480
##	[199]	717.0977	3392.7320	3488.1070	2525.1940	4099.0850	1039.2750
##	[205]	14250.9300	5095.6650	8291.1890	2861.0780	14869.1300	2830.9810
##	[211]	16251.2900	13917.2500	774.1928	3251.8280	8223.0770	2714.2860
##	[217]	2661.8500	858.3048	2795.0580	2122.1460	5242.4760	6741.0140
##	[223]	9808.1540	610.4253	2109.7600	5011.7210	1744.1610	677.0512
##	[229]	8469.1680	1331.8430	11653.9700	978.7129	2618.5240	1920.9330
##	[235]	7352.3890	2899.3440	4964.2150	5492.1690	6524.9730	776.5945
##	[241]	6515.4330	4124.9600	3917.8080	976.5325	3093.2630	5794.5650
##	[247]	762.4120	4682.6920	3959.7470	8013.3000	4221.7430	989.4124
##	[253]	5796.9400	748.3655	2564.1030	4297.7030	6270.3580	18074.5800
##	[259]	2395.6180	5406.3060	9597.1460	1058.4790	849.6023	54416.2000
##	[265]	2376.5300	4876.0940	932.4890	1476.3320	1429.7420	3721.3680
##	[271]	1821.5570	4552.4130	6926.0860	1339.2860	5648.0790	2963.4170
##	[277]	10363.5500	4072.7660	5351.9790	3714.3830	6022.4100	3434.1810
##	[283]	3447.9920	5777.1340	3119.6420	19808.2100	3191.3920	3269.0880
##	[289]	3027.1260	2213.9180	10905.0600	1597.8230	605.1582	4878.1130
##	[295]	7367.9850	1487.0410	4206.5340	629.0182	2498.7660	881.5064
##	[301]	5535.1060	2329.7320	8360.7740	2412.4650	15153.0200	9852.8730
##	[307]	4852.9010	3771.5970	4757.2920	4395.8590	2137.6570	523.1171
##	[313]	1353.2340	2128.0560	1809.0930	2112.5410	9860.9890	4159.7300

##	[319]	8288.1910	8047.5730	2963.7130	3054.8990	1676.5580	7898.4020
##	[325]	3855.1670	2762.3200	3787.9900	2378.8840	29237.8800	1641.3820
##	[331]	1093.7900	4929.3760	9711.4460	456.8409	2801.8670	44719.8900
##	[337]	36486.7400	743.2454	1129.6970	2660.9140	17674.1900	1583.5620
##	[343]	512.5741	5442.2320	5677.8550	1032.5540	4950.1380	2467.4660
##	[349]	6398.5030	1219.5920	2740.0530	4861.8870	5481.4910	1215.8220
##	[355]	4934.3450	2944.9580	1227.9200	1009.7430	1156.3170	725.0409
##	[361]	1187.7090	3950.3780	2878.3400	3933.7610	902.8148	631.6717
##	[367]	1131.1690	1082.4020	4973.6610	1353.5060	2552.6960	21431.0600
##	[373]	451.3689	1487.7010	4163.7040	1797.2670	5311.6400	581.8199
##	[379]	3153.7580	3268.4530	3045.8810	1702.1140	824.7898	9749.1560
##	[385]	276.2429	1138.0820	4740.7410	888.6441	1560.6380	1269.5480
##	[391]	2583.6660	5041.2840	12426.8700	231.3137	464.4625	7216.9820
##	[397]	1479.7800	5301.9990	3125.9210	4223.2270	616.5727	1957.6430
##	[403]	2853.2030	5379.1130	4270.4840	632.3578	4078.7800	1457.6890
##	[409]	2666.7670	5801.2000	8694.4330	4364.4860	3727.2420	1023.7530
##	[415]	2419.7190	1646.5290	3832.0180	4008.2870	1494.0830	9326.3900
##	[421]	1676.5700	2379.2260	1743.6490	2072.4130	388.4448	2861.3190
##	[427]	9480.2100	4151.1570	552.3501	833.9848	2872.0630	2626.6090
##	[433]	2250.9750	2568.9870	978.1891	4691.4770	820.5195	4531.9150
##	[439]	2644.2350	727.6523	6217.7930	892.6676	1269.3430	3849.3080
##	[445]	2333.7980	3185.6670	1429.3020	1434.8140	2778.2400	2400.5360
##	[451]	3515.4560	1684.6660	1991.9610	7964.4170	948.4264	792.9474
##	[457]	2582.3560	38000.2700	5725.3510	1752.1310	383.7088	1258.4410
##	[463]	1006.3620	659.4207	4634.7360	1243.8650	617.1413	1191.6080
##	[469]	5436.0100	3048.5030	4850.8630	1937.3810	6784.5900	724.2911
##	[475]	3388.0090	3182.1020	2467.4630	3880.9010	25994.8000	2055.3070
##	[481]	14773.2400	8046.6560	1213.7900	766.6898	24125.4400	2270.3870
##	[487]	2747.2280	348.0448	2068.1580	678.1962	1500.6450	986.6814
##	[493]	1167.7090	371.2114	2490.7080	558.8953	11209.9900	7787.5950
##	[499]	3301.5960	683.6845	4159.0500	2195.3200	11857.9400	4806.2320
##	[505]	2961.0190	1405.9940	6486.6250	1595.3640	8665.1780	906.8392
##	[511]	3434.0850	1293.8740	904.3484	3455.1610	6982.3460	365.0959
##	[517]	1288.9910	575.6337	6591.4700	808.4151	410.6411	1946.4270
##	[523]	2853.9070	2791.9770	512.0868	2102.3510	7017.0870	3785.0930
##	[529]	3453.2010	3498.1490	1537.1140	2173.9290	601.7475	725.2559
##	[535]	282.9002	4071.7950	2521.7920	550.4186	633.6154	7846.5800
##	[541]	9374.6580	4086.7820	905.7177	1726.2860	2082.8650	2100.6500
##	[547]	863.2228	2059.0290	3620.1380	2617.1810	1518.8570	2779.6840
##	[553]	3491.7470	2050.2930	1934.7420	1693.4640	1260.2360	1882.1880
##	[559]	1274.9060	1682.3080	8998.4760	4953.8450	2905.2450	1756.0260
##	[565]	2265.6570	3512.9850	7238.4670	1314.0450	17378.8300	908.8263
##	[571]	701.7356	10023.1500	2855.1240	13184.9400	1755.2370	3174.5510
##	[577]	4888.7450	5079.6260	8365.6260	962.2041	1699.7210	3701.1780
##	[583]	2103.6260	1364.8550	343.2504	973.5340	2165.0920	4893.3530
##	[589]	1759.6860	1025.0070	11456.4500	9066.9160	3641.9990	768.9534
##	[595]	5647.1440	5958.4490	3606.7800	2766.4260	14892.0000	1834.1960
##	[601]	681.9646	297.6273	2225.7800	7298.2890	1544.2870	2164.6450
##	[607]	5701.9320	2847.2290	2679.8400	3736.5830	7723.6440	1775.0610
##	[613]	1104.6640	2708.3230	2541.3400	1540.6370	7572.7370	3549.6740
##	[619]	4954.4910	1263.0860	5748.0090	2265.1670	6056.0850	5506.9420
##	[625]	9042.7370	18098.9800	20974.5600	1414.1220	1490.0070	7133.5210
##	[631]	1966.8650	1826.9510	1837.3950	5890.5340	4667.5100	4031.6050
##	[637]	9411.1170	1026.6160	990.1171	6329.5820	3538.2250	2524.1280

##	[643]	4854.6600	16926.8500	3612.2740	2876.7710	8178.3060	1262.7080
##	[649]	741.7599	5012.9190	6396.2020	374.0647	1870.7750	723.5299
##	[655]	877.3430	9935.6480	1855.3930	2060.5270	3663.9160	1084.6750
##	[661]	1144.1940	8489.6830	7935.7480	2102.0370	5742.8330	5353.5190
##	[667]	3232.4120	12929.8600	43159.6700	1984.7880	1369.6270	7263.8880
##	[673]	3426.4500	8932.1630	2632.7820	9188.2190	34219.3700	13188.2700
##	[679]	2005.5290	733.0124	5533.7660	2798.6100	5549.9100	766.6007
##	[685]	6907.9930	4395.1950	943.8492	1834.6370	319.0725	677.1869
##	[691]	11950.2600	523.8490	4831.6530	1370.4470	1562.1980	4711.8340
##	[697]	6973.8190	711.1664	619.3648	6665.4870	687.7300	3338.6990
##	[703]	822.6077	3358.7020	1980.9440	1176.9490	2308.2530	3201.8420
##	[709]	11332.2400	10595.7000	1853.2030	2033.7400	4975.2050	302.2173
##	[715]	9646.1370	3585.2870	894.2199	592.9577	4963.4220	2251.1110
##	[721]	1800.9480	1323.7450	889.1120	1190.4460	2037.5550	530.2412
##	[727]	1431.0830	2137.3430	653.9572	5729.7810	6316.4570	622.8539
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##	[769]	3746.8460	597.7199	392.2055	5647.3490	3040.2660	1216.1870
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##	[3265]	3090.2640	2404.1420	1697.2100	4800.0270	1949.4690	1067.7550
##	[3271]	11563.5700	711.5654	4247.8950	15062.6400	11797.1900	3687.7330
##	[3277]	1415.4390	52577.5100	12259.1600	3992.0890	699.9887	7912.5190
##	[3283]	6722.0740	4102.9900	802.2145	30977.1500	672.4065	492.2908
##	[3289]	2422.6250	397.1283	12241.6000	2116.8990	2351.7100	643.1243
##	[3295]	4275.7410	1523.9080	547.6224	6955.9290	1468.0480	1307.5500
##	[3301]	691.5247	705.8944	7417.7990	3270.3180	2216.9160	1368.8720
##	[3307]	1497.3480	2328.7800	9925.5930	3183.8530	1180.0580	2037.8360
##	[3313]	1484.8860	1566.9680	2788.0590	9661.1110	10593.2600	1632.4700
##	[3319]	1575.5120	575.2983	11940.6600	585.6116	11213.4500	214.9141
##	[3325]	1377.7570	7882.2530	362.5452	2979.7320	2908.5190	932.2364
##	[3331]	5253.2730	1044.5800	2596.9220	3436.6900	1432.2730	1738.4560
##	[3337]	1763.7840	2238.0390	990.5593	2382.6970	508.2005	3035.2190
##	[3343]	2278.8230	3177.8990	1294.1660	4124.6710	2749.0460	1538.3540
##	[3349]	12914.9800	5220.8960	12014.9500	2748.6200	563.3937	2735.5380
##	[3355]	6429.8420	996.9141	779.5697	7479.6090	13657.7000	1048.8000
##	[3361]	2837.2290	1870.8460	4498.4050	4464.3270	7665.6140	3359.3420
##	[3367]	2450.9100	5279.1080	2622.2580	2258.4260	2252.0110	2525.9470
##	[3373]	11688.5300	4725.8470	3400.8420	1127.9080	4553.9280	21245.2900
##	[3379]	1395.3220	4814.6250	349.3932	4278.3160	879.3303	1987.8880
##	[3385]	1471.6790	604.2852	3106.7820	11019.1500	4152.4700	2849.5650
##	[3391]	731.4767	9636.7310	731.9524	3094.1380	976.0445	5310.8030
##	[3397]	5233.4420	4419.8540	2995.7300	5183.0590	3970.2190	1217.6390
##	[3403]	1386.0940	2456.6090	1325.5070	984.6965	26710.6500	1151.1150
##	[3409]	3977.7050	5336.6680	2846.7200	14661.0900	1391.0770	6843.5390
##	[3415]	7681.5300	1222.8790	6374.7320	2482.3340	18308.6100	662.2022
##	[3421]	4825.5500	1111.0800	5956.7420	4726.5760	32232.0700	15342.5500
##	[3427]	15973.2400	22343.9300	2036.7110	6488.9150	1450.8770	1076.9360
##	[3433]	2197.2660	1285.8660	18295.5800	8032.3660	7039.6450	16432.4600
##	[3439]	10519.6500	1418.1040	882.2762	1724.7130	579.5163	2332.5100
##	[3445]	2362.9960	839.0950	2637.3050	1642.9670	900.6030	2459.9350
##	[3451]	1012.1320	5721.6700	1858.2800	2971.6880	5387.7760	2598.1410
##	[3457]	2052.5530	4105.0660	36772.5400	809.1869	3057.7340	809.4356
##	[3463]	1093.9880	2386.0330	2276.2850	6996.6670	1674.3920	3254.0390
##	[3469]	9505.3500	9796.4590	25392.5600	256.4457	2523.3390	3725.1330
##	[3475]	473.2366	496.3402	3675.2850	8848.2530	2823.2660	2813.1820
##	[3481]	2604.3450	2130.8470	5305.0580	4763.8550	2300.0720	1318.9230
##	[3487]	2025.5730	7505.9730	618.2359	1074.3250	2309.8400	880.1572
##	[3493]	635.1841	1707.6560	3005.3570	693.0776	5339.6460	4336.5490
##	[3499]	11915.8600	516.0551	9193.9520	3263.2460	457.1644	3529.2310
##	[3505]	348.4159	2898.4810	773.6910	696.2563	3025.4100	8233.6000
##	[3511]	2123.9930	2303.0080	2501.8780	5637.7500	4124.5910	2302.7450
##	[3517]	1780.5500	1901.0500	3298.2340	5697.1700	5180.0180	1443.1660
##	[3523]	1840.9820	2886.8020	1919.9820	7010.0450	13127.6000	616.6950
##	[3529]	5697.3220	3387.5390	1755.9110	2658.7020	973.4005	1649.7440
##	[3535]	12890.9000	416.3519	4050.8550	499.1303	525.1243	4741.9970
##	[3541]	431.1707	9623.7980	2045.7310	9001.4090	11773.5500	2927.1870
##	[3547]	3614.6130	1985.2500	36877.7300	3091.4340	2577.6680	6847.7060
##	[3553]	5719.1400	5074.7040	7491.6080	606.6955	642.0480	497.2863

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## [3559] 396.4322 349.0803 5072.1890 4140.3890 5365.4430 1584.4750
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## [3595] 489.1666 4445.4880 5253.4260 297.8950 61468.7800 586.3410
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## [3721] 2393.3690 3292.1330 4307.2370 3171.8600 1889.3720 6312.2090
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## [3757] 6503.0240 12496.7500 16959.6100 2352.9350 5022.9000 2325.6740
## [3763] 5742.2040 5569.1760 2668.9460 15101.1300 5632.9610 61953.4700
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## [3787] 487.4680 3601.3610 269.5984 2531.1630 2801.2380 2045.9210
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## [3799] 2751.0040 3989.0900 18854.0000 4859.1450 3431.0360 4665.8920
## [3805] 2700.7910 985.6919 543.2673 2815.2380 1028.4970 11952.6900
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## [3829] 5539.4410 7784.4140 7700.7810 7505.3060 3883.9330 2670.3250
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## [3859] 585.2772 1694.2380 2573.3840 2158.6000 515.9147 3466.3520
## [3865] 14838.0700 813.9951 2593.6860 1404.3540 1063.4420 1978.5320
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##	[3883]	1091.6820	4891.8730	1257.8500	1040.7770	793.0113	4358.9550
##	[3889]	2042.2920	1850.6820	1264.1730	5996.2710	7664.2460	8324.2250
##	[3895]	1527.6860	2856.3130	463.8940	9358.9890	1176.5290	2099.9160
##	[3901]	571.3197	1002.5350	2221.5740	9674.5700	1487.7100	2935.6350
##	[3907]	3005.6860	345.5234	3095.3150	775.1492	1997.7510	1672.5260
##	[3913]	3502.6550	599.8966	2444.1810	15035.8100	2041.7220	628.6332
##	[3919]	1753.8670	3864.2930	1801.9080	5167.5730	578.9643	2405.9970
##	[3925]	1266.0930	1070.8740	4177.2930	6078.1920	1003.7900	58134.5300
##	[3931]	6420.3780	13933.0300	847.6728	379.5341	6142.8740	7068.5850
##	[3937]	986.2510	2779.3090	2797.0140	9955.8080	3052.1090	6417.9270
##	[3943]	653.3835	1787.8810	1437.8720	3104.3970	4052.1410	3475.4660
##	[3949]	326.3154	11880.6500	5432.6540	11897.9100	530.1989	3297.2230
##	[3955]	875.0602	1003.4420	857.7568	837.1569	1654.2710	8133.9080
##	[3961]	1098.6690	1533.8160	283.8674	2176.9570	8380.8400	12545.2800
##	[3967]	1481.3370	447.6209	7909.8290	14896.6500	685.4162	25251.2500
##	[3973]	2792.7980	4505.1300	1537.2000	3459.4610	4061.5980	18157.8400
##	[3979]	1304.8000	9820.8550	7099.3710	3164.7410	5105.8540	18815.0500
##	[3985]	3324.6780	11458.3500	970.6761	3174.5810	2331.1650	8497.8950
##	[3991]	2356.1510	1619.8030	3011.0880	1079.4070	2214.9850	3131.3540
##	[3997]	1198.4940	1778.1890	817.3362	1164.1580	5905.0020	1564.0820
##	[4003]	805.2206	1123.8780	6233.6730	1806.2000	13935.5900	2023.3470
##	[4009]	1451.8480	8519.2520	7945.1150	5425.4960	2606.1320	2083.1560
##	[4015]	5698.0580	1006.5930	4205.7070	1328.8300	10028.1000	5663.6930
##	[4021]	5714.2820	1781.8260	3584.9570	34127.5900	4213.2670	1896.8510
##	[4027]	29512.0600	9644.1310	3089.2980	2224.8460	3039.4680	1005.2630
##	[4033]	607.9400	3626.3090	3714.0320	11103.9200	3824.8470	3809.3800
##	[4039]	2467.2280	1926.3250	1555.6760	4161.4610	1396.5970	5438.7470
##	[4045]	1403.1020	1629.1950	4978.9720	3480.0420	2838.4130	10551.5900
##	[4051]	3790.1870	6505.1180	3625.4050	42279.7400	8082.7660	8364.4880
##	[4057]	2229.3730	3254.7470	2675.3730	3894.4780	24986.2900	3303.0670
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##	[4069]	396.7900	3359.9450	1208.7890	2381.6590	4045.2200	1639.5420
##	[4075]	4444.1350	1983.1180	1324.1990	11627.4900	1103.8670	4379.5710
##	[4081]	11533.7900	2238.8110	2257.8100	11758.1700	1524.6720	52044.1000
##	[4087]	12474.9700	3171.9210	600.7124	4038.0580	7588.8750	3684.8960
##	[4093]	6753.7660	8129.6190	4037.1180	2149.3540	768.3446	32108.7800
##	[4099]	2157.1500	6580.0550	4893.6520	418.0949	13406.9000	22309.7900
##	[4105]	2271.0620	2315.3920	774.7393	2943.4920	1841.0320	789.9688
##	[4111]	7157.1330	3016.6000	470.0209	591.2479	6235.0730	3239.0130
##	[4117]	1972.9370	1436.6500	1373.6100	10064.0000	2936.7100	1218.0180
##	[4123]	2500.5690	2000.0500	6627.4200	804.7555	2693.7950	3205.1980
##	[4129]	10083.1600	1398.5070	9691.5430	1736.6850	1338.4680	629.7375
##	[4135]	11593.8500	626.6955	11675.5700	247.3601	1505.0250	1716.1450
##	[4141]	7680.6370	397.2655	2638.4370	2808.8770	996.8330	1247.3890
##	[4147]	4477.4270	1105.0120	3126.9100	1253.4600	2843.1200	731.4079
##	[4153]	1900.6800	2409.4400	870.2434	3269.2020	371.4499	3026.7020
##	[4159]	2564.4010	3311.8010	1014.7940	4448.3150	2887.1290	1295.6910
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##	[4171]	652.0357	3054.8560	7987.8510	939.2538	834.9733	7759.1410
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##	[4183]	4594.6370	4130.8960	1878.7120	5468.5130	2700.4700	2757.3830
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##	[4195]	1773.5070	368.6023	1072.5550	1163.0040	8977.5910	2881.7650
##	[4201]	877.0888	1996.0190	1994.6610	817.5869	2576.6480	4939.6400

##	[4207]	4374.6090	2717.4470	826.2701	8877.3760	2986.4280	1118.0020
##	[4213]	5410.4300	5312.0240	3338.0320	2578.8030	1911.2680	2858.8070
##	[4219]	7280.1520	4359.6060	1190.3370	1512.7710	2153.1350	1511.2520
##	[4225]	746.5314	26961.4800	1295.7690	3852.7010	5455.2160	2374.4680
##	[4231]	15682.9500	1500.9280	6440.9620	9742.1970	2353.5240	19182.0600
##	[4237]	706.1496	5149.8670	953.5978	6722.6500	1740.9620	3635.8440
##	[4243]	31082.9300	11770.2900	15092.9100	22353.7100	2233.5680	6660.2310
##	[4249]	1450.3040	1159.5720	2205.1470	17652.4900	7725.8580	4390.7390
##	[4255]	6284.3090	1580.0080	971.2090	2132.6290	723.1044	2309.7970
##	[4261]	2540.9130	2804.7090	4145.7940	1382.5720	993.8608	2034.3200
##	[4267]	868.4118	5780.7410	2027.1880	2883.7890	5526.6020	3540.7680
##	[4273]	3851.4340	38972.7200	1090.8150	1122.0880	619.2112	2379.5610
##	[4279]	1884.0980	1547.4040	3114.1800	9648.6430	3835.6560	25319.5500
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##	[4291]	2909.3370	820.8194	1996.0040	5662.7920	4578.3150	2413.3540
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##	[4303]	3626.7610	2219.4040	839.6352	3351.7070	649.9882	1635.4190
##	[4309]	4455.7750	739.9225	5942.8410	4420.3410	18029.6800	698.4946
##	[4315]	9922.2640	3264.0690	523.3416	2960.7690	454.1058	1451.7260
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##	[4339]	1649.8410	3831.1650	13060.3500	702.6372	6130.9160	3283.9600
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##	[4351]	568.4100	491.3668	6074.6610	422.4684	9899.0190	2162.2420
##	[4357]	8406.0460	11464.9200	3178.1550	3171.8910	2117.6460	33735.1600
##	[4363]	3361.0480	2839.1450	4931.0640	3431.9980	2465.1700	5596.2890
##	[4369]	2158.1690	1110.6780	2652.6880	3355.1080	1744.8320	8975.9880
##	[4375]	5165.7320	1309.8620	1718.5020	5100.2100	3800.6670	27397.5200
##	[4381]	1415.3200	1107.5470	313.5612	984.8287	692.2238	6375.3360
##	[4387]	3508.3990	5583.7730	1090.5140	6500.5500	8941.6850	3535.2370
##	[4393]	3424.3990	4288.6730	14384.5800	1053.9300	3932.6860	5038.6040
##	[4399]	16167.7100	2596.7780	12135.3200	2732.0030	2637.3210	3235.8510
##	[4405]	1450.5650	2925.2180	6992.9180	2761.3310	4448.6850	2965.6650
##	[4411]	3795.9240	3186.1460	3884.6800	10225.2400	1437.7600	6960.5050
##	[4417]	960.6001	883.6528	1143.9540	8046.4760	2745.1580	4466.3670
##	[4423]	8061.8040	3341.1610	934.4320	2610.4350	2996.6080	5480.3220
##	[4429]	1805.2660	781.9774	6266.7570	3852.0760	4900.0260	12004.8300
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##	[4441]	5575.4120	1289.2420	10719.0700	479.0404	6438.6110	2368.1460
##	[4447]	2158.3970	1301.1860	5989.0530	9310.6720	2018.1460	255.1579
##	[4453]	2325.5720	12842.9800	1000.8270	1310.5130	12603.3200	6566.2780
##	[4459]	3846.6320	8505.4000	3063.7430	444.2521	1091.0830	2123.8970
##	[4465]	8972.5930	2661.1460	32093.9200	2385.1780	983.0832	1005.0520
##	[4471]	4014.0160	6459.5590	5241.5640	25675.7600	4762.6000	584.7350
##	[4477]	3656.0820	2868.6700	1945.3200	1857.9730	466.7303	4174.8300
##	[4483]	6846.3490	1659.9820	3228.3530	3244.9720	17297.4400	27064.3700
##	[4489]	2329.4040	1263.3750	2233.3030	4018.3390	1435.5680	886.7913
##	[4495]	4138.9550	711.1191	8040.9690	6458.0100	1044.1150	2642.2670
##	[4501]	3083.0460	6046.5330	3410.4800	1958.9170	1623.0220	1927.7290
##	[4507]	3840.2060	10566.2100	930.8727	3031.4130	5438.1170	8747.0980
##	[4513]	4426.9650	5698.1990	6895.7150	2536.7010	2592.0400	1757.4720
##	[4519]	4365.9360	3570.4280	7947.2260	5832.5360	2535.7540	529.7215
##	[4525]	5238.7040	3330.5350	2251.5380	4946.1080	1262.1820	3162.2460

```
## [4531] 8373.7560 6190.6100 2444.3310 1483.1500 4772.1200 6611.4240
## [4537] 792.9636 1017.2520 1569.9070 4095.9450 191.4257 4801.7200
## [4543] 747.6947 1506.7790 1406.0010 8512.2690 778.9850 3927.8110
## [4549] 671.4820 1950.7510 3833.8870 955.6734 981.4275 33360.0900
## [4555] 1300.2270 2096.3800 3117.4070 24009.1700 3937.0290 674.1347
## [4561] 2002.5350 1955.9110 7935.7900 10416.3000 6064.7390 5320.7640
## [4567] 9150.9850 3176.3330 1138.9500 878.7153 1077.1320 611.2316
## [4573] 1118.8540 3623.1010 4057.0500 7242.2580 9654.6790 1060.2600
## [4579] 6584.6510 1682.7070 485.5425 10730.0900 7464.9680 1684.9860
## [4585] 9222.1100 2035.3110 23179.6700 1273.1450 2716.1420 11037.8800
## [4591] 16001.4700 32129.4100 764.4955 4509.9910 1804.8900 10641.8500
## [4597] 2605.5330 5605.6600 1280.3850 4110.7890 2601.7140 5344.1690
## [4603] 1238.3100 1391.3580 7871.5810 1670.5930 4318.3720 948.2374
## [4609] 36800.9800 14903.6900 9761.3620 926.3183 1690.1230 7369.1370
## [4615] 13774.2800 6307.7670 8163.2830 3595.9840 2603.0390 2218.2220
## [4621] 7465.3620 1625.7900 7985.0520 10844.4200 2496.3220 4930.3580
## [4627] 19259.6600 972.0223 6042.5370 1507.6850 6380.7620 2211.8060
## [4633] 3576.4120 9296.9390 831.0181 1012.8070 1228.4870 2785.7980
## [4639] 9686.1220 4978.1570 1493.6420 9692.5860 897.6185 2859.1310
## [4645] 5038.2140 534.8053 1824.2530 1185.5880 8988.0910 599.0408
## [4651] 12369.3300 5064.8580 1394.8440 2796.8270 482.0479 799.2422
## [4657] 1807.7160 4552.5230 12088.6600 10015.5800 5614.8370 842.8627
## [4663] 8526.9520 7600.1640 5564.5040 31559.7900 6425.8960 13903.5100
## [4669] 17330.2200 4592.6680 1146.5990 3974.4990 652.4800 2529.9670
## [4675] 1312.1170 4620.9950 672.4544 1445.3030 2623.5260 4284.6460
## [4681] 1360.6990 2698.4000 352.9248 645.8259 2592.5610 1732.0170
## [4687] 4862.2090 687.6039 2142.6050 2384.4170 802.4782 2745.0770
## [4693] 816.2257
```

The estimate of the missing values of INTRDVX, which is \hat{y} , equals to the following values given above.

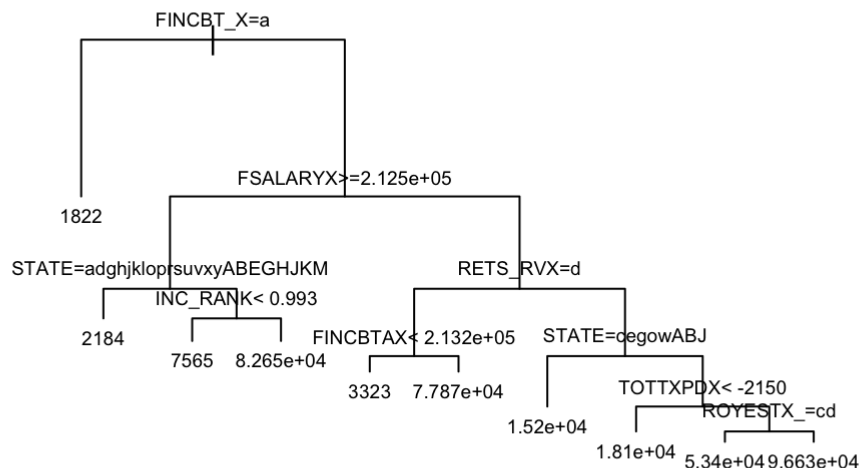
Question 4

```
y <- z$INTRDVX
w <- z$FINLWT21
miss <- is.na(y) ## obs with missing INTRDVX

rp2 <- rpart(INTRDVX ~ . - INTRDVX_, weight =FINLWT21, data=z,method="anova")
rp2
```

```
## n=2922 (1771 observations deleted due to missingness)
##
## node), split, n, deviance, yval
##      * denotes terminal node
##
##  1) root 2922 1.627725e+16  4696.624
##    2) FINCBT_X=D 2624 1.187559e+15  1821.816 *
##    3) FINCBT_X=T 298 1.062296e+16  31918.830
##    6) FSALARYX>=212524.5 148 1.977165e+15  10078.690
##   12) STATE=1,12,16,17,2,20,21,24,25,27,29,32,33,36,39,41,42,48,51,53,55,6,9 126
5.385303e+13  2184.047 *
##   13) STATE=11,26,34,47 22 1.078676e+15  49096.130
##   26) INC_RANK< 0.99305 10 1.314239e+14  7565.234 *
##   27) INC_RANK>=0.99305 12 3.042116e+14  82649.860 *
##   7) FSALARYX< 212524.5 150 6.014321e+15  54019.280
##   14) RETS_RVX=T 50 6.222578e+14  11980.150
##   28) FINCBTAX< 213208.5 43 3.714334e+13  3322.542 *
##   29) FINCBTAX>=213208.5 7 1.429290e+14  77873.200 *
##   15) RETS_RVX=A,D 100 3.473378e+15  70862.200
##   30) STATE=11,13,16,24,34,41,42,55 20 2.897553e+14  15197.080 *
##   31) STATE=1,12,15,17,18,20,25,26,27,29,32,33,36,39,4,45,48,51,53,6,8,9 80 1.
745794e+15  84213.400
##   62) TOTTXPDX< -2150 8 1.263134e+14  18098.420 *
##   63) TOTTXPDX>=-2150 72 9.093254e+14  91097.050
##  126) ROYESTX_=D,T 10 4.113645e+14  53399.160 *
##  127) ROYESTX_=A 62 2.030268e+14  96632.950 *
```

```
plot(rp2, compress = TRUE, margin=0.2)
text(rp2, cex=0.6)
```



```
yhat <- predict(rp2,newdata=z)
popmean <- (sum(w[!miss]*y[!miss])+sum(w[miss]*yhat[miss]))/sum(w)
print(popmean)
```

```
## [1] 3996.971
```

The step for this question is similar to Question 1, but I have used `cereg.dsc`. It is because I should change `INTRDVX` to `D` and `INTRDVX_` to `X` (which is already done in `cereg.dsc`). I have used the R code presented in the ppt slide for the lecture. The estimated population mean of `INTRDVX` would equal to 3996.971.

Using the similar code to the Question 2, I have calculated imputation method to estimate population mean of `INTRDVX`. The following equation would be:

$$\left(\sum_i w_i\right)^{-1} \left(\sum_{i \in S} w_i y_i + \sum_{j \in \bar{S}} w_j \hat{y}_j\right)$$

The results of the estimate of population mean of `INTRDVX` would then equal to 3996.971 dollars.

Question 5

Please refer to the next page

Question 5

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<i>Output file for Subset</i>	35

Input file for classification forest

GUIDE (do not edit this file unless you know what you are doing)
36.2 (version of GUIDE that generated this file)
1 (1=model fitting, 2=importance or DIF scoring, 3=data conversion)
"gf.out" (name of output file)
2 (1=one tree, 2=ensemble)
2 (1=bagging, 2=rforest)
2 (1=random splits of missing values, 2=nonrandom)
1 (1=classification, 2=regression)
2 (1=interaction tests, 2=skip them)
"ceclass.dsc" (name of data description file)
1 (1=accept default number of trees, 2=change)
1 (1=accept default number of variables for splitting, 2=change it)
1 (1=estimated priors, 2=equal priors, 3=other priors)
1 (1=unit misclassification costs, 2=other)
1 (1=split point from quantiles, 2=use exhaustive search)
1 (1=accept default splitting fraction, 2=change it)
1 (1=default max. number of split levels, 2=specify no. in next line)
1 (1=default min. node size, 2=specify min. value in next line)
"gf.prp" (file name for predicted class and probability estimates)
1 (rank of top variable to split root node)

Output file for classification forest

GGG U U I DDDD EEEE

G G U U I D D E
G U U I D D E
G G G U U I D D E E E
G G U U I D D E
G G U U I D D E
G G G U U U I D D D D E E E E

GUIDE Classification and Regression Trees and Forests

Version 36.2 (Build date: January 8, 2021)

Compiled with GFortran 10.2.0 on macOS Big Sur 11.1

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This software is based upon work supported by the U.S. Army Research Office,
the National Science Foundation and the National Institutes of Health.

This job was started on 03/10/21 at 15:44

Random forest of classification trees

No pruning

Data description file: ceiclass.dsc

Training sample file: cedata.txt

Missing value code: NA

Records in data file start on line 2

Number of M variables associated with C variables: 33

422 N variables changed to S

D variable is INTRDVX_

Number of records in data file: 4693

Length of longest entry in data file: 11

Missing values found among categorical variables

Separate categories will be created for missing categorical variables

Missing values found among non-categorical variables

Number of classes: 3

Warning: S variable MISC2PQ is constant

Warning: S variable MISC2CQ is constant

Warning: S variable TCARTRKP is constant

Warning: S variable TCARTRKC is constant

Warning: S variable TOTHVHRP is constant

Warning: S variable TOTHVHRC is constant

Warning: S variable VMISCHEP is constant

Warning: S variable VMISCHEC is constant

Warning: S variable ROTHFLP is constant

Warning: S variable ROTHFLC is constant

Smallest and largest positive weights are 1.3507E+03 and 7.0269E+04

Training sample class proportions of D variable INTRDVX_:

Class	#Cases	Proportion
-------	--------	------------

C	1771	0.37737055
D	2838	0.60473045
T	84	0.01789900

Summary information for training sample of size 4693

d=dependent, b=split and fit cat variable using indicator variables,
c=split-only categorical, i=fit-only categorical (via indicators),
s=split-only numerical, n=split and fit numerical, f=fit-only numerical,
m=missing-value flag variable, p=periodic variable, w=weight

Levels of M variables are for missing values in associated variables

Column	Name		Minimum	Maximum	Periods	#Missing
1	DIRACC	c		2	155	
2	DIRACC_	m		1		
3	AGE_REF	s	18.00	87.00		
4	AGE_REF_	m		0		
5	AGE2	s	22.00	87.00	1903	
6	AGE2_	m		1		
7	AS_COMP1	s	0.000	4.000		
8	AS_C_MP1	m		0		
9	AS_COMP2	s	0.000	4.000		
10	AS_C_MP2	m		0		
11	AS_COMP3	s	0.000	4.000		
12	AS_C_MP3	m		0		
13	AS_COMP4	s	0.000	4.000		
14	AS_C_MP4	m		0		
15	AS_COMP5	s	0.000	2.000		
16	AS_C_MP5	m		0		
17	BATHRMQ	s	1.000	8.000	21	
18	BATHRMQ_	m		2		
19	BEDROOMQ	s	0.000	9.000	25	
20	BEDR_OMQ	m		2		
21	BLS_URBN	s	1.000	2.000		
22	BUILDING	c		11		
23	BUIL_ING	m		0		
24	CUTENURE	c		6		
25	CUTE_URE	m		0		
26	EARNCOMP	c		9		
27	EARN_OMP	m		0		
28	EDUC_REF	s	10.00	16.00		
29	EDUCOREF	m		0		
30	EDUCA2	s	10.00	16.00	1903	
31	EDUCA2_	m		1		

32	FAM_SIZE	s	1.000	9.000	
33	FAM__IZE	m		0	
34	FAM_TYPE	c		10	
35	FAM__YPE	m		0	
36	FAMTFEDX	s	0.000	0.9928E+05	
37	FAMT_EDX	m		0	
38	FEDRFNDX	s	4.000	0.1428E+05	2597
39	FEDR_NDX	m		2	
40	FEDTAXX	s	2.000	0.8223E+05	3793
41	FEDTAXX_	m		2	
42	FGOVRETX	s	0.000	0.2469E+05	
43	FGOV_ETX	m		0	
44	FINCATAX	s	-0.3380E+06	0.1410E+07	
45	FINCAT_X	m		0	
46	FINCBTAX	s	-0.3430E+06	0.1410E+07	
47	FINCBT_X	m		0	
48	FINDRETX	s	0.000	0.1272E+06	
49	FIND_ETX	m		0	
50	FINLWT21	w	1351.	0.7027E+05	
51	FJSSDEDX	s	0.000	0.3042E+05	
52	FJSS_EDX	m		0	
53	FPRIPENX	s	0.000	0.5902E+05	
54	FPRI_ENX	m		0	
55	FRRDEDX	s	0.000	9980.	
56	FRRDEDX_	m		0	
57	FRRETIRX	s	0.000	0.5807E+05	
58	FRRE_IRX	m		0	
59	FSALARYX	s	0.000	0.5301E+06	
60	FSAL_RYX	m		0	
61	FSLTAXX	s	0.000	0.3010E+05	
62	FSLTAXX_	m		0	
63	FSSIX	s	0.000	0.3048E+05	
64	FSSIX_	m		0	
65	HLFBATHQ	s	0.000	4.000	23
66	HLFB_THQ	m		2	
67	INC_HRS1	s	1.000	93.00	1744
68	INC__RS1	m		1	
69	INC_HRS2	s	1.000	99.00	2886
70	INC__RS2	m		1	
71	INC_RANK	s	0.1000E-03	1.000	367
72	INC__ANK	m		1	
73	INCNONW1	c		6	2949
74	INCN_NW1	m		1	
75	INCNONW2	c		6	3710

76	INCN_NW2	m		1	
77	INCOMEY1	c		6	1744
78	INCO_EY1	m		1	
79	INCOMEY2	c		6	2886
80	INCO_EY2	m		1	
81	INCWEEK1	s	0.000	52.00	
82	INCW_EK1	m		0	
83	INCWEEK2	s	0.000	52.00	1903
84	INCW_EK2	m		1	
85	MISCTAXX	s	5.000	0.2524E+05	4601
86	MISC_AXX	m		3	
87	LUMPSUMX	s	4.000	0.5492E+06	4454
88	LUMP_UMX	m		2	
89	MARITAL1	c		6	
90	MARI_AL1	m		0	
91	NO_EARNR	s	0.000	6.000	
92	NO_E_RNR	m		0	
93	NONINCMX	s	0.000	0.5492E+06	
94	NONI_CMX	m		0	
95	NUM_AUTO	s	0.000	7.000	
96	NUM__UTO	m		0	
97	OCCUCOD1	c		15	1744
98	OCCU_OD1	m		1	
99	OCCUCOD2	c		15	2886
100	OCCU_OD2	m		1	
101	OTHRINCX	s	2.000	0.5788E+05	4566
102	OTHR_NCX	m		2	
103	PERSLT18	s	0.000	7.000	
104	PERS_T18	m		0	
105	PERSOT64	s	0.000	4.000	
106	PERS_T64	m		0	
107	POPSIZE	s	1.000	5.000	38
108	PRINEARN	c		8	
109	PRIN_ARN	m		0	
110	QINTRVMO	c		12	
111	QINTRVYR	c		2	
112	RACE2	c		6	1903
113	RACE2_	m		1	
114	REF_RACE	c		7	
115	REF__ACE	m		0	
116	REGION	c		4	38
117	RENTEQVX	s	1.000	4694.	667
118	RENT_QVX	m		1	
119	RESPSTAT	c		3	

120	RESP_TAT	m		0	
121	ROOMSQ	s	1.000	19.00	30
122	ROOMSQ_	m		2	
123	SEX_REF	c		3	
124	SEX_REF_	m		0	
125	SEX2	c		2	1903
126	SEX2_	m		1	
127	SLOCTAXX	s	1.000	0.2657E+05	4053
128	SLOC_AXX	m		2	
129	SLRFUNDX	s	1.000	4169.	3242
130	SLRF_NDX	m		2	
131	SMSASTAT	c		2	
132	ST_HOUS	c		3	
133	ST_HOUS_	m		0	
134	TOTTXPDX	s	-0.1845E+05	0.1467E+06	
135	TOTT_PDX	m		0	
136	VEHQ	s	0.000	17.00	
137	VEHQ_	m		0	
138	WELFAREX	s	300.0	4344.	4680
139	WELF_REX	m		2	
140	TOTEXPPQ	s	233.2	0.2782E+06	
141	TOTEXPCQ	s	-3759.	0.9669E+05	
142	FOODPQ	s	0.000	0.2358E+05	
143	FOODCQ	s	0.000	7363.	
144	FDHOME PQ	s	0.000	8450.	
145	FDHOME CQ	s	0.000	6067.	
146	FDAWAY PQ	s	0.000	0.2098E+05	
147	FDAWAY CQ	s	0.000	5660.	
148	FDXMAP PQ	s	0.000	0.2098E+05	
149	FDXMAP CQ	s	0.000	5660.	
150	FDMAPPQ	s	0.000	900.0	
151	FDMAPCQ	s	0.000	666.7	
152	ALCBEPQ	s	0.000	3152.	
153	ALCBECQ	s	0.000	2550.	
154	HOUSPQ	s	0.000	0.1811E+06	
155	HOUSCQ	s	-2196.	0.3466E+05	
156	SHELTPQ	s	0.000	0.4074E+05	
157	SHELTCQ	s	0.000	0.3354E+05	
158	OWNDWEPQ	s	0.000	0.3070E+05	
159	OWNDWECQ	s	0.000	0.3321E+05	
160	MRTINTPQ	s	0.000	0.2531E+05	
161	MRTINTCQ	s	0.000	0.1112E+05	
162	PROPTXPQ	s	0.000	5870.	
163	PROPTXCQ	s	0.000	4247.	

164	MRPINSQP	s	0.000	0.2110E+05
165	MRPINSCQ	s	0.000	0.2373E+05
166	RENDWEPQ	s	0.000	8546.
167	RENDWECQ	s	0.000	6742.
168	RNTXRPPQ	s	0.000	8546.
169	RNTXRPCQ	s	0.000	6742.
170	RNTAPYPQ	s	0.000	2922.
171	RNTAPYCQ	s	0.000	3000.
172	OTHLODPQ	s	0.000	0.3342E+05
173	OTHLODCQ	s	0.000	0.1367E+05
174	UTILPQ	s	0.000	7581.
175	UTILCQ	s	0.000	3921.
176	NTLGASQP	s	0.000	2306.
177	NTLGASCQ	s	0.000	885.0
178	ELTRCPQ	s	0.000	4473.
179	ELTRCCQ	s	0.000	3261.
180	ALLFULPQ	s	0.000	2752.
181	ALLFULCQ	s	0.000	3081.
182	FULOILPQ	s	0.000	2752.
183	FULOILCQ	s	0.000	3081.
184	OTHFLSPQ	s	0.000	1981.
185	OTHFLSCQ	s	0.000	2269.
186	TELEPHPQ	s	0.000	1638.
187	TELEPHCQ	s	0.000	1907.
188	WATRPSQP	s	0.000	1880.
189	WATRPSCQ	s	0.000	1035.
190	HOUSOPPQ	s	-37.00	0.2493E+05
191	HOUSOPCQ	s	-4868.	0.1815E+05
192	DOMSRVPQ	s	-37.00	0.2003E+05
193	DOMSRVCQ	s	-4960.	0.1805E+05
194	DMSXCCPQ	s	-37.00	0.2003E+05
195	DMSXCCCQ	s	-4960.	0.1000E+05
196	BBYDAYPQ	s	0.000	0.1500E+05
197	BBYDAYCQ	s	0.000	0.1740E+05
198	OTHHEXPQ	s	0.000	0.2493E+05
199	OTHHEXCQ	s	0.000	5653.
200	HOUSEQPQ	s	0.000	0.1544E+06
201	HOUSEQCQ	s	0.000	0.2268E+05
202	TEXTILPQ	s	0.000	4000.
203	TEXTILCQ	s	0.000	2946.
204	FURNTRPQ	s	0.000	0.7500E+05
205	FURNTRCQ	s	0.000	0.1811E+05
206	FLRCVRPQ	s	0.000	0.1000E+05
207	FLRCVRCQ	s	0.000	5500.

208	MAJAPPPQ	s	0.000	0.1802E+05
209	MAJAPPCQ	s	0.000	0.1200E+05
210	SMLAPPPQ	s	0.000	3000.
211	SMLAPPCQ	s	0.000	944.0
212	MISCEQPQ	s	0.000	0.6510E+05
213	MISCEQCQ	s	0.000	7155.
214	APPARPQ	s	0.000	0.2440E+05
215	APPARCQ	s	0.000	4604.
216	MENBOYPQ	s	0.000	4200.
217	MENBOYCQ	s	0.000	1797.
218	MENSIXPQ	s	0.000	4200.
219	MENSIXCQ	s	0.000	1797.
220	BOYFIFPQ	s	0.000	2150.
221	BOYFIFCQ	s	0.000	448.0
222	WOMGRLPQ	s	0.000	4540.
223	WOMGRLCQ	s	0.000	2958.
224	WOMSIXPQ	s	0.000	4474.
225	WOMSIXCQ	s	0.000	2958.
226	GRLFIFPQ	s	0.000	1799.
227	GRLFIFCQ	s	0.000	1624.
228	CHLDRNPQ	s	0.000	717.0
229	CHLDRNCQ	s	0.000	961.0
230	FOOTWRPQ	s	0.000	2162.
231	FOOTWRCQ	s	0.000	1148.
232	OTHAPLPQ	s	0.000	0.2048E+05
233	OTHAPLCQ	s	0.000	4076.
234	TRANSPQ	s	0.000	0.8778E+05
235	TRANSCQ	s	0.000	0.6490E+05
236	CARTKNPQ	s	0.000	0.8700E+05
237	CARTKNCQ	s	0.000	0.6480E+05
238	CARTKUPQ	s	0.000	0.4200E+05
239	CARTKUCQ	s	0.000	0.4163E+05
240	OTHVEHPQ	s	0.000	0.1417E+05
241	OTHVEHCQ	s	0.000	0.1800E+05
242	GASMOPQ	s	0.000	4832.
243	GASMOCQ	s	0.000	6400.
244	VEHFINPQ	s	0.000	1201.
245	VEHFINCQ	s	0.000	716.0
246	MAINRPPQ	s	0.000	0.1400E+05
247	MAINRPCQ	s	0.000	8060.
248	VEHINSPQ	s	0.000	4236.
249	VEHINSCQ	s	0.000	3800.
250	VRNTLOPQ	s	0.000	0.2200E+05
251	VRNTLOCQ	s	0.000	0.2223E+05

252	PUBTRAPQ	s	0.000	0.2287E+05
253	PUBTRACQ	s	0.000	0.1198E+05
254	TRNTRPPQ	s	0.000	0.2287E+05
255	TRNTRPCQ	s	0.000	0.1198E+05
256	TRNOTHPQ	s	0.000	1448.
257	TRNOTHCQ	s	0.000	1386.
258	HEALTHPQ	s	-2402.	0.1665E+05
259	HEALTHCQ	s	-0.1281E+05	0.2189E+05
260	HLTHINPQ	s	0.000	0.1426E+05
261	HLTHINCQ	s	0.000	8789.
262	MEDSRVPQ	s	-3290.	0.1543E+05
263	MEDSRVCQ	s	-0.1330E+05	0.1368E+05
264	PREDRGPQ	s	-940.0	6844.
265	PREDRGCQ	s	-260.0	2800.
266	MEDSUPPQ	s	-3600.	7000.
267	MEDSUPCQ	s	-449.0	7530.
268	ENTERTPQ	s	0.000	0.6318E+05
269	ENTERTCQ	s	0.000	0.4249E+05
270	FEEADMPQ	s	0.000	0.1958E+05
271	FEEADMCPQ	s	0.000	0.1577E+05
272	TVRDIOPQ	s	0.000	7007.
273	TVRDIOCQ	s	0.000	5143.
274	OTHEQPPQ	s	0.000	0.6300E+05
275	OTHEQPCQ	s	0.000	0.4204E+05
276	PETTOYPQ	s	0.000	0.1165E+05
277	PETTOYCQ	s	0.000	5657.
278	OTHENTPQ	s	0.000	0.6300E+05
279	OTHENTCQ	s	0.000	0.4204E+05
280	PERSCAPQ	s	0.000	1550.
281	PERSCACQ	s	0.000	973.3
282	READPQ	s	0.000	3304.
283	READCQ	s	0.000	1100.
284	EDUCAPQ	s	0.000	0.3850E+05
285	EDUCACQ	s	0.000	0.3500E+05
286	TOBACCPQ	s	0.000	2253.
287	TOBACCCQ	s	0.000	2600.
288	MISCPQ	s	0.000	0.2305E+05
289	MISCCQ	s	0.000	0.1703E+05
290	MISC1PQ	s	0.000	0.2305E+05
291	MISC1CQ	s	0.000	0.1703E+05
292	MISC2PQ	s	0.000	0.000
293	MISC2CQ	s	0.000	0.000
294	CASHCOPQ	s	0.000	0.8109E+05
295	CASHCOCQ	s	0.000	0.2150E+05

296	PERINSPQ	s	0.000	0.7000E+05	
297	PERINSCQ	s	0.000	0.3337E+05	
298	LIFINSPQ	s	0.000	0.7000E+05	
299	LIFINSCQ	s	0.000	0.3100E+05	
300	RETPENPQ	s	0.000	0.2584E+05	
301	RETPENCQ	s	0.000	0.2298E+05	
302	HH_CU_Q	s	1.000	5.000	
303	HH_CU_Q_	m		0	
304	HHID	c		46	4614
305	HHID_	m		1	
306	POV_CY	c		2	378
307	POV_CY_	m		1	
308	POV_PY	c		2	378
309	POV_PY_	m		1	
310	SWIMPOOL	c		1	4115
311	SWIM_OOL	m		2	
312	APTMENT	c		1	4616
313	APTMENT_	m		2	
314	OFSTPARK	c		1	1181
315	OFST_ARK	m		2	
316	WINDOWAC	c		1	4049
317	WIND_WAC	m		2	
318	CNTRALAC	c		1	1491
319	CNTR_LAC	m		2	
320	CHILDAGE	s	0.000	7.000	
321	CHIL_AGE	m		0	
322	INCLASS	s	1.000	9.000	
323	STATE	c		39	492
324	ERANKH	s	0.4735E-02	1.000	367
325	ERANKH_	m		1	
326	TOTEX4PQ	s	233.2	0.2782E+06	
327	TOTEX4CQ	s	-3759.	0.9669E+05	
328	MISCX4PQ	s	0.000	0.2305E+05	
329	MISCX4CQ	s	0.000	0.1703E+05	
330	VEHQL	s	0.000	4.000	
331	VEHQL_	m		0	
332	NUM_TVAN	s	0.000	9.000	
333	NUM__VAN	m		0	
334	TTOTALP	s	0.000	0.3821E+05	
335	TTOTALC	s	0.000	0.2303E+05	
336	TFOODTOP	s	0.000	5600.	
337	TFOODTOC	s	0.000	4305.	
338	TFOODAWP	s	0.000	5500.	
339	TFOODAWC	s	0.000	4180.	

340	TFOODHOP	s	0.000	3300.
341	TFOODHOC	s	0.000	1050.
342	TALCB EVP	s	0.000	2252.
343	TALCBVC	s	0.000	1220.
344	TOTHRLOP	s	0.000	0.1013E+05
345	TOTHRLOC	s	0.000	7498.
346	TTRANPRP	s	0.000	0.2296E+05
347	TTRANPRC	s	0.000	0.1198E+05
348	TGASMOTP	s	0.000	1750.
349	TGASMOTC	s	0.000	2200.
350	TVRENTLP	s	0.000	445.0
351	TVRENTLC	s	0.000	514.0
352	TCARTRKP	s	0.000	0.000
353	TCARTRKC	s	0.000	0.000
354	TOTHVHRP	s	0.000	0.000
355	TOTHVHRC	s	0.000	0.000
356	TOTHTREP	s	0.000	445.0
357	TOTHTREC	s	0.000	514.0
358	TTRNTRIP	s	0.000	0.2287E+05
359	TTRNTRIC	s	0.000	0.1198E+05
360	TFAREP	s	0.000	0.2202E+05
361	TFAREC	s	0.000	0.1126E+05
362	TAIRFARP	s	0.000	0.2086E+05
363	TAIRFARC	s	0.000	0.1000E+05
364	TOTHFARP	s	0.000	9800.
365	TOTHFARC	s	0.000	6238.
366	TLOCALTP	s	0.000	853.0
367	TLOCALTC	s	0.000	1000.
368	TENTRMNP	s	0.000	7400.
369	TENTRMNC	s	0.000	4131.
370	TFEESADP	s	0.000	7400.
371	TFEESADC	s	0.000	4131.
372	TOTHENTP	s	0.000	1400.
373	TOTHENTC	s	0.000	2400.
374	OWNVACP	s	0.000	0.2329E+05
375	OWNVACC	s	0.000	0.1367E+05
376	VOTHRLOP	s	0.000	0.2329E+05
377	VOTHRLOC	s	0.000	0.1367E+05
378	VMISCHEP	s	0.000	0.000
379	VMISCHEC	s	0.000	0.000
380	UTILOWNP	s	0.000	2077.
381	UTILOWNC	s	0.000	1523.
382	VFUELOIP	s	0.000	682.0
383	VFUELOIC	s	0.000	625.0

384	VOTHRFLP	s	0.000	547.0
385	VOTHRFLC	s	0.000	907.0
386	VELECTRP	s	0.000	1360.
387	VELECTRC	s	0.000	988.0
388	VNATLGAP	s	0.000	2077.
389	VNATLGAC	s	0.000	201.0
390	VWATERPP	s	0.000	475.0
391	VWATERPC	s	0.000	571.0
392	MRTPRNOP	s	0.000	0.2643E+05
393	MRTPRNOC	s	0.000	0.1322E+05
394	UTILRNTP	s	0.000	1157.
395	UTILRNTPC	s	0.000	628.0
396	RFUELOIP	s	0.000	565.0
397	RFUELOIC	s	0.000	553.0
398	ROTHRFLP	s	0.000	0.000
399	ROTHRFLC	s	0.000	0.000
400	RELECTRP	s	0.000	558.0
401	RELECTRC	s	0.000	209.0
402	RNATLGAP	s	0.000	254.0
403	RNATLGAC	s	0.000	89.00
404	RWATERPP	s	0.000	552.0
405	RWATERPC	s	0.000	242.0
406	POVLEVCY	s	0.1145E+05	0.5184E+05
407	POVL_VCY	m		0
408	POVLEVPY	s	0.1122E+05	0.5078E+05
409	POVL_VPY	m		0
410	PORCH	c		1 1006
411	PORCH_	m		2
412	ETOTALP	s	233.2	0.2782E+06
413	ETOTALC	s	-2683.	0.7288E+05
414	ETOTAPX4	s	233.2	0.2782E+06
415	ETOTACX4	s	-2683.	0.7288E+05
416	EHOUSNGP	s	0.000	0.1811E+06
417	EHOUSNGC	s	-2196.	0.3897E+05
418	ESHELTRP	s	0.000	0.4456E+05
419	ESHELTRC	s	0.000	0.3786E+05
420	EOWNDWLP	s	0.000	0.4456E+05
421	EOWNDWLC	s	0.000	0.3752E+05
422	EOTHLODP	s	0.000	0.3342E+05
423	EOTHLODC	s	0.000	0.1433E+05
424	EMRTPNOP	s	0.000	0.3516E+05
425	EMRTPNOC	s	0.000	0.2247E+05
426	EMRTPNVP	s	0.000	0.2643E+05
427	EMRTPNVC	s	0.000	0.1322E+05

428	ETRANPTP	s	0.000	0.8868E+05	
429	ETRANPTC	s	0.000	0.5436E+05	
430	EVEHPURP	s	0.000	0.8790E+05	
431	EVEHPURC	s	0.000	0.5400E+05	
432	ECARTKNP	s	0.000	0.8790E+05	
433	ECARTKNC	s	0.000	0.5400E+05	
434	ECARTKUP	s	0.000	0.2643E+05	
435	ECARTKUC	s	0.000	0.2662E+05	
436	EOTHVEHP	s	0.000	0.1166E+05	
437	EOTHVEHC	s	0.000	6542.	
438	EENTRMTP	s	0.000	0.6318E+05	
439	EENTRMTC	s	0.000	0.1605E+05	
440	EOTHENTP	s	0.000	0.6300E+05	
441	EOTHENTC	s	0.000	7502.	
442	ENOMOTRP	s	0.000	7700.	
443	ENOMOTRC	s	0.000	1500.	
444	EMOTRVHP	s	0.000	0.6300E+05	
445	EMOTRVHC	s	0.000	6971.	
446	EENTMSCP	s	0.000	6000.	
447	EENTMSCC	s	0.000	5000.	
448	EMISCELP	s	0.000	0.2305E+05	
449	EMISCELC	s	0.000	0.1703E+05	
450	EMISCMTP	s	0.000	1096.	
451	EMISCMTC	s	0.000	2113.	
452	UNISTRQ	s	1.000	10.00	
453	UNISTRQ_	m		0	
455	WELF_EBX	c		2	
456	LUMPSUMB	s	2.000	12.00	4684
457	LUMP_UMB	m		2	
458	LMPSUMBX	s	1200.	0.8000E+05	4684
459	LMPS_MBX	m		2	
460	OTHRINCB	s	5.000	12.00	4687
461	OTHR_NCB	m		2	
462	OTRINCBX	s			4693
463	OTRI_CBX	m		1	
464	INCLASS2	s	1.000	7.000	
465	INCL_SS2	m		0	
467	HORREF1	c		6	4532
468	HORREF1_	m		1	
469	HORREF2	c		5	4577
470	HORREF2_	m		1	
471	ERANKHM	s	0.6205E-02	1.000	
472	ERANKHM_	m		0	
473	FGOVRETM	s	0.000	0.2509E+05	

474	FGOV_ETM	m		0	
475	FPRIPENM	s	0.000	0.5826E+05	
476	FPRI_ENM	m		0	
477	FRRDEDM	s	0.000	0.1043E+05	
478	FRRDEDM_	m		0	
479	PSU	c		21	2616
480	HISP_REF	c		2	
481	HISP2	c		2	1903
482	HIGH_EDU	s	10.00	16.00	
483	BUILT	s	1915.	2013.	592
484	BUILT_	m		2	
485	CREFINX	s	0.000	6629.	4360
486	CRED_INX	m		2	
487	CREDITB	s	1.000	5.000	4667
488	CREDITB_	m		2	
489	CREDITBX	s	250.0	0.2250E+05	4667
490	CRED_TBX	m		2	
491	CREDITX	s	1.000	0.5132E+05	4311
492	CREDITX_	m		2	
493	CREDTYRX	s	0.000	0.5092E+05	4327
494	CRED_YRX	m		2	
495	CREDYRB	s	1.000	6.000	4656
496	CREDYRB_	m		2	
497	CREDYRBX	s	250.0	0.3500E+05	4656
498	CRED_RBX	m		2	
499	DEFBENRP	c		2	3551
500	DEFB_NRP	m		2	
501	EITC	c		2	1042
502	EITC_	m		2	
503	FMLPYRX	s	4.000	4000.	4598
504	FMLP_YRX	m		2	
505	FS_MTHI	s	1.000	12.00	4644
506	FS_MTHI_	m		1	
507	FSMPFRMX	s	-0.4000E+06	0.1090E+07	
508	FSMP_RMX	m		0	
514	INTRDVX_	d		3	
522	IRAB	s	1.000	6.000	4514
523	IRAB_	m		2	
524	IRABX	s	1000.	0.7250E+06	4514
525	IRABX_	m		2	
526	IRAX	s	0.000	0.2635E+07	3917
527	IRAX_	m		2	
528	IRAYRB	s	1.000	6.000	4489
529	IRAYRB_	m		2	

530	IRAYRBX	s	1000.	0.7250E+06	4489
531	IRAYRBX_	m		2	
532	IRAYRX	s	0.000	0.2129E+07	3964
533	IRAYRX_	m		2	
534	JFS_AMT	s	0.000	4800.	
535	JFS_AMT_	m		0	
536	LIQDYRBX	s	250.0	0.3500E+05	4531
537	LIQD_RBX	m		2	
538	LIQUIDBX	s	250.0	0.3500E+05	4563
539	LIQU_DBX	m		2	
540	LIQUDYRB	s	1.000	6.000	4531
541	LIQU_YRB	m		2	
542	LIQUDYRX	s	0.000	0.5155E+06	3942
543	LIQU_YRX	m		2	
544	LIQUIDB	s	1.000	6.000	4563
545	LIQUIDB_	m		2	
546	LIQUIDX	s	0.000	0.4910E+06	3892
547	LIQUIDX_	m		2	
548	MEALSPAY	s	1.000	2.000	9
549	MEAL_PAY	m		2	
550	MLPAYWKX	s	2.000	300.0	4598
551	MLPA_WKX	m		2	
552	MLPYQWKS	s	1.000	52.00	4592
553	MLPY_WKS	m		2	
554	NETRENTB	s	0.000	12.00	4666
555	NETR_NTB	m		3	
556	NETRENTX	s	-0.5499E+05	0.1148E+06	4338
557	NETR_NTX	m		2	
558	NETRNTBX	s	-2400.	0.7130E+05	4666
559	NETR_TBX	m		2	
560	OTHAStBX	s	0.3000E+05	0.7250E+06	4673
561	OTHA_TBx	m		2	
562	OTHAStB	s	3.000	6.000	4673
563	OTHAStB_	m		3	
564	OTHAStX	s	2.000	0.2767E+07	4648
565	OTHAStX_	m		2	
566	OTHFInX	s	0.000	900.0	4654
567	OTHFInX_	m		2	
568	OTHLONBX	s	250.0	0.2250E+05	4690
569	OTHL_NBX	m		2	
570	OTHLyRBX	s	750.0	0.2250E+05	4689
571	OTHL_RBX	m		2	
572	OTHLNyRB	s	2.000	5.000	4689
573	OTHL_YRB	m		2	

574	OTHLNYRX	s	0.000	0.5500E+05	4642
575	OTHL_YRX	m		2	
576	OTHLOAN	s	1.000	2.000	3485
577	OTHLOAN_	m		1	
578	OTHLONB	s	1.000	5.000	4690
579	OTHLONB_	m		2	
580	OTHLONX	s	1.000	0.3106E+06	4638
581	OTHLONX_	m		2	
582	OTHREGBX	s	488.0	0.5000E+05	4678
583	OTHR_GBX	m		2	
584	OTHREGB	s	1.000	12.00	4678
585	OTHREGB_	m		2	
586	OTHREGX	s	36.00	0.6367E+05	4422
587	OTHREGX_	m		2	
588	OTHSYRBX	s	6000.	0.7250E+06	4669
589	OTHS_RBX	m		2	
590	OTHSTYRB	s	2.000	6.000	4669
591	OTHS_YRB	m		2	
592	OTHSTYRX	s	0.000	0.1533E+07	4656
593	OTHS_YRX	m		2	
594	RETSURVX	s	30.00	0.1269E+06	3571
595	RETS_RVX	m		2	
596	RETSRVBX	s	480.0	0.6200E+05	4626
597	RETS_VBX	m		2	
598	RETSURV	c		3	
599	RETSURV_	m		0	
600	RETSURVB	s	1.000	12.00	4626
601	RETS_RVB	m		2	
604	ROYESTBX	s	200.0	0.6000E+05	4654
605	ROYE_TBX	m		2	
606	ROYESTB	s	1.000	12.00	4654
607	ROYESTB_	m		2	
608	ROYESTX	s	1.000	0.1592E+06	4441
609	ROYESTX_	m		2	
610	STCKYRBX	s	1000.	0.7250E+06	4613
611	STCK_RBX	m		2	
612	STDNTYRB	s	3.000	6.000	4675
613	STDN_YRB	m		2	
614	STDNTYRX	s	0.000	0.4100E+06	4566
615	STDN_YRX	m		2	
616	STDTYRBX	s	1750.	0.3500E+05	4675
617	STDT_RBX	m		2	
618	STOCKYRB	s	1.000	6.000	4613
619	STOC_YRB	m		2	

620	STOCKYRX	s	0.000	0.5784E+07	4420
621	STOC_YRX	m		2	
622	STOCKB	s	1.000	6.000	4632
623	STOCKB_	m		3	
624	STOCKBX	s	1000.	0.7250E+06	4632
625	STOCKBX_	m		2	
626	STOCKX	s	25.00	0.6587E+07	4390
627	STOCKX_	m		2	
628	STUDFINX	s	0.000	9000.	4595
629	STUD_INX	m		2	
630	STUDNTBX	s	6250.	0.3500E+05	4682
631	STUD_TBX	m		2	
632	STUDNTB	s	4.000	6.000	4682
633	STUDNTB_	m		2	
634	STUDNTX	s	250.0	0.4200E+06	4556
635	STUDNTX_	m		2	
636	WHLFYRBX	s	250.0	0.3500E+05	4648
637	WHLF_RBX	m		2	
638	WHLFYRB	s	1.000	6.000	4648
639	WHLFYRB_	m		2	
640	WHLFYRX	s	0.000	0.7674E+06	4524
641	WHLFYRX_	m		3	
642	WHOLIFBX	s	250.0	0.3500E+05	4654
643	WHOL_FBX	m		2	
644	WHOLIFB	s	1.000	6.000	4654
645	WHOLIFB_	m		3	
646	WHOLIFX	s	1.000	0.7892E+06	4508
647	WHOLIFX_	m		3	
648	TOTXEST	s	-8990.	0.2938E+06	
649	FFTAXOWE	s	-8943.	0.2485E+06	
650	FFTA_OWE	m		0	
651	FSTAXOWE	s	-2505.	0.5991E+05	
652	FSTA_OWE	m		0	
653	ETOTA	s	1199.	0.2782E+06	

Total #cases w/ #missing

#cases	miss.	D	ord. vals	#X-var	#N-var	#F-var	#S-var
4693	0	4693	16	0	0	422	
#P-var	#M-var	#B-var	#C-var	#I-var			
0	171	0	42	0			

Number of cases used for training: 4693

Number of split variables: 464

Number of cases excluded due to 0 weight or missing D: 0

Number of trees in ensemble: 500
Number of variables used for splitting: 155
Warning: No linear splits; number of S variables must be < 225
Simple node models
Estimated priors
Unit misclassification costs
Warning: All positive weights treated as 1
Univariate split highest priority
No interaction splits
No linear splits
Fraction of cases used for splitting each node: .0213
Maximum number of split levels: 19
Minimum node sample size: 23
Mean number of terminal nodes: 139.8

Classification matrix for training sample:

Predicted	True class		
class	C	D	T
C	1284	69	7
D	487	2769	77
T	0	0	0
Total	1771	2838	84

Number of cases used for tree construction: 4693
Number misclassified: 640
Resubstitution estimate of mean misclassification cost: .1364

Number of OOB cases: 4693
Number OOB misclassified: 1047
OOB estimate of mean misclassification cost: .2231
Mean number of trees per OOB observation: 183.96

Predicted class probabilities are stored in gf.prp
Elapsed time in seconds: 1596.3

Input file for regression forest

GUIDE (do not edit this file unless you know what you are doing)
36.2 (version of GUIDE that generated this file)
1 (1=model fitting, 2=importance or DIF scoring, 3=data conversion)
"gregf.out" (name of output file)
2 (1=one tree, 2=ensemble)
2 (1=bagging, 2=rforest)

2 (1=random splits of missing values, 2=nonrandom)
 2 (1=classification, 2=regression)
 2 (1=interaction tests, 2=skip them)
 "cereg.dsc" (name of data description file)
 1 (1=accept default number of trees, 2=change)
 1 (1=accept default number of variables for splitting, 2=change it)
 1 (1=split point from quantiles, 2=use exhaustive search)
 1 (1=accept default splitting fraction, 2=change it)
 1 (1=default max. number of split levels, 2=specify no. in next line)
 1 (1=default min. node size, 2=specify min. value in next line)
 "cereg1.fit" (file name for predicted values)
 1 (rank of top variable to split root node)

Output file for regression forest

```

GGG U U I DDDD EEEE
G G U U I D D E
G U U I D D E
G GG U U I D D EEE
G G U U I D D E
G G U U I D D E
GGG UUU I DDDD EEEE
  
```

GUIDE Classification and Regression Trees and Forests

Version 36.2 (Build date: January 8, 2021)

Compiled with GFortran 10.2.0 on macOS Big Sur 11.1

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This software is based upon work supported by the U.S. Army Research Office,
the National Science Foundation and the National Institutes of Health.

This job was started on 03/10/21 at 20:59

Random forest of GUIDE least-squares regression trees

No pruning

Data description file: cereg.dsc

Training sample file: cedata.txt

Missing value code: NA

Records in data file start on line 2

Number of M variables associated with C variables: 33

409 N variables changed to S

D variable is INTRDVX

Piecewise constant model

Number of records in data file: 4693

Length of longest entry in data file: 11

Missing values found in D variable
 Missing values found among categorical variables
 Separate categories will be created for missing categorical variables
 Missing values found among non-categorical variables
 Warning: S variable OTHRINCB is constant
 Warning: S variable NETRENTB is constant
 Warning: S variable NETRNTBX is constant
 Warning: S variable OTHLONBX is constant
 Warning: S variable OTHLONB is constant
 Smallest and largest positive weights are 1.3507E+03 and 7.0269E+04

Summary information for training sample of size 2922 (excluding observations with non-positive weight or missing values in d, e, t, r or z variables)
 d=dependent, b=split and fit cat variable using indicator variables,
 c=split-only categorical, i=fit-only categorical (via indicators),
 s=split-only numerical, n=split and fit numerical, f=fit-only numerical,
 m=missing-value flag variable, p=periodic variable, w=weight
 Levels of M variables are for missing values in associated variables

			#Codes/ Levels/					
Column	Name		Minimum	Maximum	Periods	#Missing		
1	DIRACC	c		2	116			
2	DIRACC_	m		1				
3	AGE_REF	s	18.00	87.00				
4	AGE_REF_	m		0				
5	AGE2	s	22.00	87.00	1225			
6	AGE2_	m		1				
7	AS_COMP1	s	0.000	4.000				
8	AS_C_MP1	m		0				
9	AS_COMP2	s	0.000	4.000				
10	AS_C_MP2	m		0				
11	AS_COMP3	s	0.000	4.000				
12	AS_C_MP3	m		0				
13	AS_COMP4	s	0.000	3.000				
14	AS_C_MP4	m		0				
15	AS_COMP5	s	0.000	2.000				
16	AS_C_MP5	m		0				
17	BATHRMQ	s	1.000	8.000	10			
18	BATHRMQ_	m		2				
19	BEDROOMQ	s	0.000	9.000	10			
20	BEDR_OMQ	m		2				
21	BLS_URBN	s	1.000	2.000				
22	BUILDING	c		11				
23	BUIL ING	m		0				

24	CUTENURE	c			6	
25	CUTE_URE	m			0	
26	EARNCOMP	c			9	
27	EARN_OMP	m			0	
28	EDUC_REF	s	10.00	16.00		
29	EDUCOREF	m			0	
30	EDUCA2	s	10.00	16.00		1225
31	EDUCA2_	m			1	
32	FAM_SIZE	s	1.000	9.000		
33	FAM__IZE	m			0	
34	FAM_TYPE	c			10	
35	FAM__YPE	m			0	
36	FAMTFEDX	s	0.000	0.9928E+05		
37	FAMT_EDX	m			0	
38	FEDRFNDX	s	4.000	0.1428E+05		1415
39	FEDR_NDX	m			2	
40	FEDTAXX	s	2.000	0.8223E+05		2282
41	FEDTAXX_	m			2	
42	FGOVRET	s	0.000	0.2469E+05		
43	FGOV_ETX	m			0	
44	FINCATAX	s	-0.3380E+06	0.1410E+07		
45	FINCAT_X	m			0	
46	FINCBTAX	s	-0.3430E+06	0.1410E+07		
47	FINCBT_X	m			0	
48	FINDRET	s	0.000	0.1272E+06		
49	FIND_ETX	m			0	
50	FINLWT21	w	1351.	0.7027E+05		
51	FJSSDEDX	s	0.000	0.3042E+05		
52	FJSS_EDX	m			0	
53	FPRIPENX	s	0.000	0.4589E+05		
54	FPRI_ENX	m			0	
55	FRRDEDX	s	0.000	9980.		
56	FRRDEDX_	m			0	
57	FRRETIRX	s	0.000	0.5241E+05		
58	FRRE_IRX	m			0	
59	FSALARYX	s	0.000	0.5301E+06		
60	FSAL_RYX	m			0	
61	FSLTAXX	s	0.000	0.3010E+05		
62	FSLTAXX_	m			0	
63	FSSIX	s	0.000	0.3048E+05		
64	FSSIX_	m			0	
65	HLFBATHQ	s	0.000	3.000		12
66	HLFB_THQ	m			2	
67	INC_HRS1	s	1.000	93.00		1016

68	INC__RS1	m			1	
69	INC_HRS2	s	1.000	84.00		1773
70	INC__RS2	m			1	
71	INC_RANK	s	0.1000E-03	1.000		64
72	INC__ANK	m			1	
73	INCNONW1	c			6	1906
74	INCN_NW1	m			1	
75	INCNONW2	c			6	2374
76	INCN_NW2	m			1	
77	INCOMEY1	c			6	1016
78	INCO_EY1	m			1	
79	INCOMEY2	c			6	1773
80	INCO_EY2	m			1	
81	INCWEEK1	s	0.000	52.00		
82	INCW_EK1	m			0	
83	INCWEEK2	s	0.000	52.00		1225
84	INCW_EK2	m			1	
85	MISCTAXX	s	5.000	0.2524E+05		2855
86	MISC_AXX	m			1	
87	LUMPSUMX	s	4.000	0.5492E+06		2735
88	LUMP_UMX	m			2	
89	MARITAL1	c			6	
90	MARI_AL1	m			0	
91	NO_EARNR	s	0.000	6.000		
92	NO_E_RNR	m			0	
93	NONINCMX	s	0.000	0.5492E+06		
94	NONI_CMX	m			0	
95	NUM_AUTO	s	0.000	7.000		
96	NUM__UTO	m			0	
97	OCCUCOD1	c			15	1016
98	OCCU_OD1	m			1	
99	OCCUCOD2	c			15	1773
100	OCCU_OD2	m			1	
101	OTHRINCX	s	2.000	0.5788E+05		2822
102	OTHR_NCX	m			2	
103	PERSLT18	s	0.000	7.000		
104	PERS_T18	m			0	
105	PERSOT64	s	0.000	3.000		
106	PERS_T64	m			0	
107	POPSIZE	s	1.000	5.000		27
108	PRINEARN	c			8	
109	PRIN_ARN	m			0	
110	QINTRVMO	c			12	
111	QINTRVYR	c			2	

112	RACE2	c	6	1225	
113	RACE2_	m	1		
114	REF_RACE	c	7		
115	REF__ACE	m	0		
116	REGION	c	4	27	
117	RENTEQVX	s	1.000	4694.	451
118	RENT_QVX	m	1		
119	RESPSTAT	c	3		
120	RESP_TAT	m	0		
121	ROOMSQ	s	1.000	19.00	12
122	ROOMSQ_	m	2		
123	SEX_REF	c	3		
124	SEX_REF_	m	0		
125	SEX2	c	2	1225	
126	SEX2_	m	1		
127	SLOCTAXX	s	1.000	0.2657E+05	2441
128	SLOC_AX	m	2		
129	SLRFUNDX	s	1.000	4169.	1859
130	SLRF_NDX	m	2		
131	SMSASTAT	c	2		
132	ST_HOUS	c	3		
133	ST_HOUS_	m	0		
134	TOTTXPDX	s	-0.1845E+05	0.1467E+06	
135	TOTT_PDX	m	0		
136	VEHQ	s	0.000	17.00	
137	VEHQ_	m	0		
138	WELFAREX	s	300.0	4344.	2909
139	WELF_REX	m	2		
140	TOTEXPPQ	s	233.2	0.2782E+06	
141	TOTEXPCQ	s	0.000	0.8056E+05	
142	FOODPQ	s	0.000	0.2358E+05	
143	FOODCQ	s	0.000	7363.	
144	FDHOMEPCQ	s	0.000	8450.	
145	FDHOMEPCQ	s	0.000	6067.	
146	FDAWAYPQ	s	0.000	0.2098E+05	
147	FDAWAYCQ	s	0.000	5660.	
148	FDXMAPPQ	s	0.000	0.2098E+05	
149	FDXMAPCQ	s	0.000	5660.	
150	FDMAPPQ	s	0.000	780.0	
151	FDMAPCQ	s	0.000	666.7	
152	ALCBEVPQ	s	0.000	3152.	
153	ALCBEVCQ	s	0.000	2550.	
154	HOUSPQ	s	0.000	0.1811E+06	
155	HOUSCQ	s	0.000	0.2794E+05	

156	SHELTPQ	s	0.000	0.4074E+05
157	SHELTCQ	s	0.000	0.2547E+05
158	OWNDWEPQ	s	0.000	0.3070E+05
159	OWNDWECQ	s	0.000	0.2507E+05
160	MRTINTPQ	s	0.000	0.2531E+05
161	MRTINTCQ	s	0.000	9450.
162	PROPTXPQ	s	0.000	4870.
163	PROPTXCQ	s	0.000	4247.
164	MRPINSPQ	s	0.000	0.2110E+05
165	MRPINSCQ	s	0.000	0.2373E+05
166	RENDWEPQ	s	0.000	8546.
167	RENDWECQ	s	0.000	6742.
168	RNTXRPPQ	s	0.000	8546.
169	RNTXRPCQ	s	0.000	6742.
170	RNTAPYPQ	s	0.000	2922.
171	RNTAPYCQ	s	0.000	1433.
172	OTHLDPQ	s	0.000	0.3342E+05
173	OTHLDCQ	s	0.000	0.1367E+05
174	UTILPQ	s	0.000	7581.
175	UTILCQ	s	0.000	3921.
176	NTLGASPQ	s	0.000	2306.
177	NTLGASCQ	s	0.000	885.0
178	ELTRCPQ	s	0.000	4473.
179	ELTRCCQ	s	0.000	2200.
180	ALLFULPQ	s	0.000	2752.
181	ALLFULCQ	s	0.000	3081.
182	FULOILPQ	s	0.000	2752.
183	FULOILCQ	s	0.000	3081.
184	OTHFLSPQ	s	0.000	1813.
185	OTHFLSCQ	s	0.000	2269.
186	TELEPHPQ	s	0.000	1638.
187	TELEPHCQ	s	0.000	1497.
188	WATRPSPQ	s	0.000	1880.
189	WATRPSCQ	s	0.000	1035.
190	HOUSOPPQ	s	0.000	0.2493E+05
191	HOUSOPCQ	s	0.000	8380.
192	DOMSRVPQ	s	0.000	0.1620E+05
193	DOMSRVCQ	s	0.000	8192.
194	DMSXCCPQ	s	0.000	0.1062E+05
195	DMSXCCCQ	s	0.000	7150.
196	BBYDAYPQ	s	0.000	0.1500E+05
197	BBYDAYCQ	s	0.000	7600.
198	OTHHEXPQ	s	0.000	0.2493E+05
199	OTHHEXCQ	s	0.000	5349.

200	HOUSEQPQ	s	0.000	0.1544E+06
201	HOUSEQCQ	s	0.000	0.2268E+05
202	TEXTILPQ	s	0.000	4000.
203	TEXTILCQ	s	0.000	2946.
204	FURNTRPQ	s	0.000	0.7500E+05
205	FURNTRCQ	s	0.000	0.1811E+05
206	FLRCVRPQ	s	0.000	0.1000E+05
207	FLRCVRCQ	s	0.000	2500.
208	MAJAPPPQ	s	0.000	4657.
209	MAJAPPCQ	s	0.000	5500.
210	SMLAPPPQ	s	0.000	1000.
211	SMLAPPCQ	s	0.000	944.0
212	MISCEQPQ	s	0.000	0.6510E+05
213	MISCEQCQ	s	0.000	7155.
214	APPARPQ	s	0.000	0.2118E+05
215	APPARCQ	s	0.000	4604.
216	MENBOYPQ	s	0.000	4200.
217	MENBOYCQ	s	0.000	1754.
218	MENSIXPQ	s	0.000	4200.
219	MENSIXCQ	s	0.000	1754.
220	BOYFIFPQ	s	0.000	460.0
221	BOYFIFCQ	s	0.000	322.0
222	WOMGRLPQ	s	0.000	3181.
223	WOMGRLCQ	s	0.000	1174.
224	WOMSIXPQ	s	0.000	3181.
225	WOMSIXCQ	s	0.000	1174.
226	GRLFIFPQ	s	0.000	1056.
227	GRLFIFCQ	s	0.000	856.0
228	CHLDRNPQ	s	0.000	717.0
229	CHLDRNCQ	s	0.000	961.0
230	FOOTWRPQ	s	0.000	1903.
231	FOOTWRCQ	s	0.000	900.0
232	OTHAPLPQ	s	0.000	0.2048E+05
233	OTHAPLCQ	s	0.000	4076.
234	TRANSPQ	s	0.000	0.8778E+05
235	TRANSCQ	s	0.000	0.5436E+05
236	CARTKNPQ	s	0.000	0.8700E+05
237	CARTKNCQ	s	0.000	0.5400E+05
238	CARTKUPQ	s	0.000	0.3770E+05
239	CARTKUCQ	s	0.000	0.3300E+05
240	OTHVEHPQ	s	0.000	0.1417E+05
241	OTHVEHCQ	s	0.000	2700.
242	GASMOPQ	s	0.000	4832.
243	GASMOCQ	s	0.000	3770.

244	VEHFINPQ	s	0.000	1044.
245	VEHFINCQ	s	0.000	716.0
246	MAINRPPQ	s	0.000	4984.
247	MAINRPCQ	s	0.000	8060.
248	VEHINSPQ	s	0.000	3944.
249	VEHINSCQ	s	0.000	3167.
250	VRNTLOPQ	s	0.000	0.1301E+05
251	VRNTLOCQ	s	0.000	6512.
252	PUBTRAPQ	s	0.000	0.2074E+05
253	PUBTRACQ	s	0.000	0.1047E+05
254	TRNTRPPQ	s	0.000	0.2067E+05
255	TRNTRPCQ	s	0.000	0.1042E+05
256	TRNOTHPQ	s	0.000	1448.
257	TRNOTHCQ	s	0.000	1140.
258	HEALTHPQ	s	-100.0	0.1538E+05
259	HEALTHCQ	s	-941.7	7982.
260	HLTHINPQ	s	0.000	0.1221E+05
261	HLTHINCQ	s	0.000	6175.
262	MEDSRVPQ	s	-475.0	0.1198E+05
263	MEDSRVCQ	s	-1180.	7982.
264	PREDRGPQ	s	-100.0	2000.
265	PREDRGCQ	s	-260.0	2200.
266	MEDSUPPQ	s	-300.0	7000.
267	MEDSUPCQ	s	-449.0	5310.
268	ENTERTPQ	s	0.000	0.6318E+05
269	ENTERTCQ	s	0.000	8790.
270	FEEADMPQ	s	0.000	8844.
271	FEEADMCPQ	s	0.000	8354.
272	TVRDIOPQ	s	0.000	7007.
273	TVRDIOCQ	s	0.000	5143.
274	OTHEQPPQ	s	0.000	0.6300E+05
275	OTHEQPCQ	s	0.000	7154.
276	PETTOYPQ	s	0.000	4425.
277	PETTOYCQ	s	0.000	5657.
278	OTHENTPQ	s	0.000	0.6300E+05
279	OTHENTCQ	s	0.000	7154.
280	PERSCAPQ	s	0.000	1018.
281	PERSCACQ	s	0.000	800.0
282	READPQ	s	0.000	3304.
283	READCQ	s	0.000	606.0
284	EDUCAPQ	s	0.000	0.3500E+05
285	EDUCACQ	s	0.000	0.3500E+05
286	TOBACCPQ	s	0.000	2253.
287	TOBACCCQ	s	0.000	2600.

288	MISCPQ	s	0.000	0.2000E+05		
289	MISCCQ	s	0.000	0.1703E+05		
290	MISC1PQ	s	0.000	0.2000E+05		
291	MISC1CQ	s	0.000	0.1703E+05		
294	CASHCOPQ	s	0.000	0.8109E+05		
295	CASHCOCQ	s	0.000	0.1600E+05		
296	PERINSPQ	s	0.000	0.2589E+05		
297	PERINSCQ	s	0.000	0.2298E+05		
298	LIFINSPQ	s	0.000	7085.		
299	LIFINSCQ	s	0.000	5842.		
300	RETPENPQ	s	0.000	0.2584E+05		
301	RETPENCQ	s	0.000	0.2298E+05		
302	HH_CU_Q	s	1.000	5.000		
303	HH_CU_Q_	m		0		
304	HHID	c		46	2855	
305	HHID_	m		1		
306	POV_CY	c		2	73	
307	POV_CY_	m		1		
308	POV_PY	c		2	73	
309	POV_PY_	m		1		
310	SWIMPOOL	c		1	2546	
311	SWIM_OOL	m		2		
312	APTMENT	c		1	2874	
313	APTMENT_	m		2		
314	OFSTPARK	c		1	782	
315	OFST_ARK	m		2		
316	WINDOWAC	c		1	2546	
317	WIND_WAC	m		2		
318	CNTRALAC	c		1	934	
319	CNTR_LAC	m		2		
320	CHILDAGE	s	0.000	7.000		
321	CHIL_AGE	m		0		
322	INCLASS	s	1.000	9.000		
323	STATE	c		39	322	
324	ERANKH	s	0.6848E-02	1.000		64
325	ERANKH_	m		1		
326	TOTEX4PQ	s	233.2	0.2782E+06		
327	TOTEX4CQ	s	0.000	0.8056E+05		
328	MISCX4PQ	s	0.000	0.2000E+05		
329	MISCX4CQ	s	0.000	0.1703E+05		
330	VEHQL	s	0.000	4.000		
331	VEHQL_	m		0		
332	NUM_TVAN	s	0.000	9.000		
333	NUM__VAN	m		0		

334	TTOTALP	s	0.000	0.3821E+05
335	TTOTALC	s	0.000	0.2303E+05
336	TFOODTOP	s	0.000	5500.
337	TFOODTOC	s	0.000	4305.
338	TFOODAWP	s	0.000	5500.
339	TFOODAWC	s	0.000	4180.
340	TFOODHOP	s	0.000	3300.
341	TFOODHOC	s	0.000	1050.
342	TALCBEVP	s	0.000	2252.
343	TALCBEVC	s	0.000	1220.
344	TOTHRLOP	s	0.000	0.1013E+05
345	TOTHRLOC	s	0.000	7498.
346	TTRANPRP	s	0.000	0.2101E+05
347	TTRANPRC	s	0.000	0.1086E+05
348	TGASMOTP	s	0.000	1750.
349	TGASMOTC	s	0.000	1540.
350	TVRENTLP	s	0.000	445.0
351	TVRENTLC	s	0.000	514.0
356	TOTHTREP	s	0.000	445.0
357	TOTHTREC	s	0.000	514.0
358	TTRNTRIP	s	0.000	0.2067E+05
359	TTRNTRIC	s	0.000	0.1042E+05
360	TFAREP	s	0.000	0.2046E+05
361	TFAREC	s	0.000	0.1030E+05
362	TAIRFARP	s	0.000	0.2000E+05
363	TAIRFARC	s	0.000	0.1000E+05
364	TOTHFARP	s	0.000	9800.
365	TOTHFARC	s	0.000	3521.
366	TLOCALTP	s	0.000	728.0
367	TLOCALTC	s	0.000	1000.
368	TENTRMNP	s	0.000	7400.
369	TENTRMNC	s	0.000	3000.
370	TFEESADP	s	0.000	7400.
371	TFEESADC	s	0.000	3000.
372	TOTHENTP	s	0.000	1400.
373	TOTHENTC	s	0.000	2400.
374	OWNVACP	s	0.000	0.2329E+05
375	OWNVACC	s	0.000	0.1367E+05
376	VOTHRLOP	s	0.000	0.2329E+05
377	VOTHRLOC	s	0.000	0.1367E+05
380	UTILOWNP	s	0.000	2077.
381	UTILOWNC	s	0.000	943.0
382	VFUELOIP	s	0.000	682.0
383	VFUELOIC	s	0.000	625.0

384	VOTHRFLP	s	0.000	547.0
385	VOTHRFLC	s	0.000	907.0
386	VELECTRP	s	0.000	1360.
387	VELECTRC	s	0.000	489.0
388	VNATLGAP	s	0.000	2077.
389	VNATLGAC	s	0.000	177.0
390	VWATERPP	s	0.000	429.0
391	VWATERPC	s	0.000	571.0
392	MRTPRNOP	s	0.000	0.2643E+05
393	MRTPRNOC	s	0.000	0.1322E+05
394	UTILRNTP	s	0.000	1157.
395	UTILRNTP	s	0.000	628.0
396	RFUELOIP	s	0.000	565.0
397	RFUELOIC	s	0.000	553.0
400	RELECTRP	s	0.000	558.0
401	RELECTRC	s	0.000	209.0
402	RNATLGAP	s	0.000	254.0
403	RNATLGAC	s	0.000	59.00
404	RWATERPP	s	0.000	552.0
405	RWATERPC	s	0.000	242.0
406	POVLEVCY	s	0.1145E+05	0.5087E+05
407	POVL_VCY	m		0
408	POVLEVPY	s	0.1122E+05	0.4982E+05
409	POVL_VPY	m		0
410	PORCH	c		1 624
411	PORCH_	m		2
412	ETOTALP	s	233.2	0.2782E+06
413	ETOTALC	s	0.000	0.6995E+05
414	ETOTAPX4	s	233.2	0.2782E+06
415	ETOTACX4	s	0.000	0.6995E+05
416	EHOUSNGP	s	0.000	0.1811E+06
417	EHOUSNGC	s	0.000	0.3303E+05
418	ESHELTRP	s	0.000	0.4456E+05
419	ESHELTRC	s	0.000	0.2724E+05
420	EOWNDWLP	s	0.000	0.4456E+05
421	EOWNDWLC	s	0.000	0.2613E+05
422	EOTHLODP	s	0.000	0.3342E+05
423	EOTHLODC	s	0.000	0.1433E+05
424	EMRTPNOP	s	0.000	0.3516E+05
425	EMRTPNOC	s	0.000	0.2247E+05
426	EMRTPNVP	s	0.000	0.2643E+05
427	EMRTPNVC	s	0.000	0.1322E+05
428	ETRANPTP	s	0.000	0.8868E+05
429	ETRANPTC	s	0.000	0.5436E+05

430	EVEHPURP	s	0.000	0.8790E+05	
431	EVEHPURC	s	0.000	0.5400E+05	
432	ECARTKNP	s	0.000	0.8790E+05	
433	ECARTKNC	s	0.000	0.5400E+05	
434	ECARTKUP	s	0.000	0.2643E+05	
435	ECARTKUC	s	0.000	0.2662E+05	
436	EOTHVEHP	s	0.000	0.1166E+05	
437	EOTHVEHC	s	0.000	2700.	
438	EENTRMTP	s	0.000	0.6318E+05	
439	EENTRMTC	s	0.000	8790.	
440	EOTHENTP	s	0.000	0.6300E+05	
441	EOTHENTC	s	0.000	7154.	
442	ENOMOTRP	s	0.000	7700.	
443	ENOMOTRC	s	0.000	696.0	
444	EMOTRVHP	s	0.000	0.6300E+05	
445	EMOTRVHC	s	0.000	6971.	
446	EENTMSCP	s	0.000	3750.	
447	EENTMSCC	s	0.000	5000.	
448	EMISCELP	s	0.000	0.2000E+05	
449	EMISCELC	s	0.000	0.1703E+05	
450	EMISCMTP	s	0.000	1048.	
451	EMISCMTC	s	0.000	2113.	
452	UNISTRQ	s	1.000	10.00	
453	UNISTRQ_	m		0	
455	WELF_EBX	c		2	
457	LUMP_UMB	c		3	
459	LMPS_MBX	c		3	
460	OTHRINCB	s	5.000	5.000	2921
461	OTHR_NCB	m		1	
464	INCLASS2	s	1.000	7.000	
465	INCL_SS2	m		0	
467	HORREF1	c		6	2800
468	HORREF1_	m		1	
469	HORREF2	c		5	2840
470	HORREF2_	m		1	
471	ERANKHM	s	0.7504E-02	1.000	
472	ERANKHM_	m		0	
473	FGOVRETM	s	0.000	0.2509E+05	
474	FGOV_ETM	m		0	
475	FPRIPENM	s	0.000	0.4551E+05	
476	FPRI_ENM	m		0	
477	FRRDEDM	s	0.000	0.1043E+05	
478	FRRDEDM_	m		0	
479	PSU	c		21	1659

480	HISP_REF	c		2	
481	HISP2	c		2	1225
482	HIGH_EDU	s	10.00	16.00	
483	BUILT	s	1915.	2012.	363
484	BUILT_	m		2	
485	CREDFINX	s	0.000	6629.	2665
486	CRED_INX	m		2	
487	CREDITB	s	1.000	5.000	2914
488	CREDITB_	m		2	
489	CREDITBX	s	250.0	0.2250E+05	2914
490	CRED_TBX	m		2	
491	CREDITX	s	1.000	0.5132E+05	2628
492	CREDITX_	m		2	
493	CREDTYRX	s	0.000	0.5092E+05	2639
494	CRED_YRX	m		2	
495	CREDYRB	s	1.000	6.000	2904
496	CREDYRB_	m		2	
497	CREDYRBX	s	250.0	0.3500E+05	2904
498	CRED_RBX	m		2	
499	DEFBENRP	c		2	2169
500	DEFB_NRP	m		2	
501	EITC	c		2	598
502	EITC_	m		2	
503	FMLPYRX	s	4.000	4000.	2844
504	FMLP_YRX	m		2	
505	FS_MTHI	s	1.000	12.00	2893
506	FS_MTHI_	m		1	
507	FSMPFRMX	s	-0.4000E+06	0.1090E+07	
508	FSMP_RMX	m		0	
513	INTRDVX	d	1.000	0.9834E+05	
522	IRAB	s	1.000	6.000	2826
523	IRAB_	m		2	
524	IRABX	s	1000.	0.7250E+06	2826
525	IRABX_	m		2	
526	IRAX	s	0.000	0.2635E+07	2309
527	IRAX_	m		2	
528	IRAYRB	s	1.000	6.000	2804
529	IRAYRB_	m		2	
530	IRAYRBX	s	1000.	0.7250E+06	2804
531	IRAYRBX_	m		2	
532	IRAYRX	s	0.000	0.2129E+07	2344
533	IRAYRX_	m		2	
534	JFS_AMT	s	0.000	4800.	
535	JFS_AMT_	m		0	

536	LIQDYRBX	s	250.0	0.3500E+05	2839
537	LIQD_RBX	m		2	
538	LIQUIDBX	s	250.0	0.3500E+05	2861
539	LIQU_DBX	m		2	
540	LIQUDYRB	s	1.000	6.000	2839
541	LIQU_YRB	m		2	
542	LIQUDYRX	s	0.000	0.5155E+06	2320
543	LIQU_YRX	m		2	
544	LIQUIDB	s	1.000	6.000	2861
545	LIQUIDB_	m		2	
546	LIQUIDX	s	0.000	0.4910E+06	2289
547	LIQUIDX_	m		2	
548	MEALSPAY	s	1.000	2.000	2
549	MEAL_PAY	m		1	
550	MLPAYWKX	s	2.000	120.0	2844
551	MLPA_WKX	m		2	
552	MLPYQWKS	s	1.000	52.00	2841
553	MLPY_WKS	m		1	
554	NETRENTB	s	0.000	0.000	2920
555	NETR_NTB	m		2	
556	NETRENTX	s	-0.5499E+05	0.1148E+06	2650
557	NETR_NTX	m		2	
558	NETRNTBX	s	-2400.	-2400.	2920
559	NETR_TBX	m		2	
560	OTHAStBX	s	0.3000E+05	0.7250E+06	2909
561	OTHA_TBx	m		2	
562	OTHAStB	s	3.000	6.000	2909
563	OTHAStB_	m		3	
564	OTHAStX	s	2.000	0.6000E+06	2889
565	OTHAStX_	m		2	
566	OTHFInX	s	0.000	900.0	2889
567	OTHFInX_	m		2	
568	OTHLONBX	s	250.0	250.0	2921
569	OTHL_NBX	m		2	
570	OTHLyRBX	s	750.0	0.2250E+05	2920
571	OTHL_RBX	m		2	
572	OTHLNyRB	s	2.000	5.000	2920
573	OTHL_YRB	m		2	
574	OTHLNyRX	s	0.000	0.5500E+05	2880
575	OTHL_YRX	m		2	
576	OTHLON	s	1.000	2.000	2150
577	OTHLON_	m		1	
578	OTHLONB	s	1.000	1.000	2921
579	OTHLONB_	m		2	

580	OTHLONX	s	1.000	0.3106E+06	2877
581	OTHLONX_	m		2	
582	OTHREGBX	s	488.0	0.5000E+05	2913
583	OTHR_GBX	m		2	
584	OTHREGB	s	1.000	12.00	2913
585	OTHREGB_	m		2	
586	OTHREGX	s	100.0	0.6367E+05	2725
587	OTHREGX_	m		2	
588	OTHSYRBX	s	6000.	0.7250E+06	2908
589	OTHS_RBX	m		2	
590	OTHSTYRB	s	2.000	6.000	2908
591	OTHS_YRB	m		2	
592	OTHSTYRX	s	0.000	0.1533E+07	2894
593	OTHS_YRX	m		2	
594	RETSURVX	s	30.00	0.1269E+06	2127
595	RETS_RVX	m		2	
596	RETSRVBX	s	480.0	0.6200E+05	2913
597	RETS_VBX	m		2	
598	RETSURV	c		3	
599	RETSURV_	m		0	
600	RETSURVB	s	1.000	12.00	2913
601	RETS_RVB	m		2	
604	ROYESTBX	s	1300.	6000.	2916
605	ROYE_TBX	m		2	
606	ROYESTB	s	2.000	6.000	2916
607	ROYESTB_	m		2	
608	ROYESTX	s	1.000	0.1592E+06	2730
609	ROYESTX_	m		2	
610	STCKYRBX	s	1000.	0.7250E+06	2874
611	STCK_RBX	m		2	
612	STDNTYRB	s	4.000	6.000	2913
613	STDN_YRB	m		2	
614	STDNTYRX	s	0.000	0.4100E+06	2821
615	STDN_YRX	m		2	
616	STDTYRBX	s	6250.	0.3500E+05	2913
617	STDY_RBX	m		2	
618	STOCKYRB	s	1.000	6.000	2874
619	STOC_YRB	m		2	
620	STOCKYRX	s	0.000	0.5784E+07	2703
621	STOC_YRX	m		2	
622	STOCKB	s	1.000	6.000	2887
623	STOCKB_	m		3	
624	STOCKBX	s	1000.	0.7250E+06	2887
625	STOCKBX_	m		2	

626	STOCKX	s	25.00	0.6587E+07	2683
627	STOCKX_	m		2	
628	STUDFINX	s	0.000	9000.	2847
629	STUD_INX	m		2	
630	STUDNTBX	s	6250.	0.3500E+05	2917
631	STUD_TBX	m		2	
632	STUDNTB	s	4.000	6.000	2917
633	STUDNTB_	m		2	
634	STUDNTX	s	250.0	0.4200E+06	2815
635	STUDNTX_	m		2	
636	WHLFYRBX	s	250.0	0.3500E+05	2895
637	WHLF_RBX	m		2	
638	WHLFYRB	s	1.000	6.000	2895
639	WHLFYRB_	m		2	
640	WHLFYRX	s	0.000	0.7674E+06	2786
641	WHLFYRX_	m		3	
642	WHOLIFBX	s	250.0	0.3500E+05	2895
643	WHOL_FBX	m		2	
644	WHOLIFB	s	1.000	6.000	2895
645	WHOLIFB_	m		2	
646	WHOLIFX	s	1.000	0.7892E+06	2780
647	WHOLIFX_	m		3	
648	TOTXEST	s	-8990.	0.2938E+06	
649	FFTAXOWE	s	-8943.	0.2485E+06	
650	FFTA_OWE	m		0	
651	FSTAXOWE	s	-2505.	0.5991E+05	
652	FSTA_OWE	m		0	
653	ETOTA	s	1199.	0.2782E+06	

Total #cases w/ #missing

#cases	miss.	D	ord.	vals	#X-var	#N-var	#F-var	#S-var
--------	-------	---	------	------	--------	--------	--------	--------

4693	1771	4693	30	0	0	409		
------	------	------	----	---	---	-----	--	--

#P-var	#M-var	#B-var	#C-var	#I-var
--------	--------	--------	--------	--------

0	168	0	44	0
---	-----	---	----	---

Weight variable FINLWT21 in column: 50

Number of cases used for training: 2922

Number of split variables: 453

Number of cases excluded due to 0 weight or missing D: 1771

Number of trees in ensemble: 500

Number of variables used for splitting: 152

No nodewise interaction tests

Fraction of cases used for splitting each node: .0342

Maximum number of split levels: 17

Minimum node sample size: 14
Mean number of terminal nodes: 152.6
Resubstitution estimate of mean squared error: 121481371.7050
based on number of training cases: 2922
Proportion of variance (R-squared) explained by ensemble model: 0.5707

Number of OOB cases: 2922
OOB estimate of mean squared error: 173455792.0092
Mean number of trees per OOB observation: 183.86

Number of test cases with 0 weight and nonmissing responses = 0
Observed and fitted values are stored in cereg1.fit
Elapsed time in seconds: 1373.1

Input file for Subset

GUIDE (do not edit this file unless you know what you are doing)
36.2 (version of GUIDE that generated this file)
3 (1=model fitting, 2=importance or DIF scoring, 3=data conversion)
"subset.out" (name of output file)
1 (1=D is categorical, 2=D is real)
"ceclass.dsc" (name of data description file)
1 (choice of data format)
"subset.txt" (name of new data file)

Output file for Subset

```
GGG U U I DDDD EEEE  
G G U U I D D E  
G U U I D D E  
G GG U U I D D EEE  
G G U U I D D E  
G G U U I D D E  
GGG UUU I DDDD EEEE
```

GUIDE Classification and Regression Trees and Forests
Version 36.2 (Build date: January 8, 2021)
Compiled with GFortran 10.2.0 on macOS Big Sur 11.1
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This software is based upon work supported by the U.S. Army Research Office,
the National Science Foundation and the National Institutes of Health.

This job was started on 03/10/21 at 19:03

No pruning
Data description file: ceiclass.dsc
Training sample file: cedata.txt
Missing value code: NA
Records in data file start on line 2
Number of M variables associated with C variables: 33
423 N variables changed to S
D variable is INTRDVX_
Number of records in data file: 4693
Length of longest entry in data file: 11
Missing values found among categorical variables
Separate categories will be created for missing categorical variables
Missing values found among non-categorical variables
Number of classes: 3
Warning: "x" variables will be excluded
Input your choice: 1