> ?which

> set.seed(100)

> x <- sample (0:999, 250, replace=T)

> y <- sample (0:999, 250, replace=T)

> x

Create the vectors

(a) (2, 3, … , 29, 30)

> c <- c(2:30)

> c

[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

[28] 29 30

(b) (30, 29, … , 2)

> c <- c(30:2)

> c

[1] 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4

[28] 3 2

(c) (1, 2, 3, …. , 29, 30, 29, 28, , 2, 1)

> c <- c(1:30,29:1)

> c

[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

[28] 28 29 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6

[55] 5 4 3 2 1

(d) (4, 6, 3) and assign it to the name dev.

> c(4,6,3) -> dev

> dev

[1] 4 6 3

For parts (e), (f) and (g) .

(e) (5, 6, 7, 5, 6, 7, , 5, 6, 7) where there are 10 occurrences of 5.

> ids <- c(rep(5:7,10))

> ids

[1] 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7

(f) (5, 6, 7, 5, 6, 7, , 5, 6, 7, 5) where there are 11 occurrences of 5, 10 occurrences of 6 and 10 occurrences of 7.

> o2 <- c(rep(c(5,6,7),10),5)

> o2

[1] 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5 6 7 5

(g) (4, 4, , 4, 6, 6, , 6, 3, 3, , 3) where there are 10 occurrences of 4, 20 occurrences of 6 and 30 occurrences of 3.

> o3 <- c(rep(c(4),each=10),rep(c(6),each=20),rep(c(3),each=30))

> o3

[1] 4 4 4 4 4 4 4 4 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 3 3 3 3 3 3 3 3 3 3

[41] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3

2. Create a vector of the values of eX sin(x) at x = 3, 3.1, 3.2, , 6.

seq(3,6,by=0.1)

[1] 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9

[21] 5.0 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9 6.0

3. Execute the following lines which create two vectors of random integers which are chosen with

replacement from the integers 0, 1, : : : , 999. Both vectors have length 250.

set.seed(100)

x <- Sample (0:999, 250, replace=T)

y <- Sample (0:999, 250, replace=T)

> set.seed(100)

> x <- sample (0:999, 250, replace=T)

> y <- sample (0:999, 250, replace=T)

1. Identify out the values in y which are > 500.

\y[which(y>500)]

[1] 956 843 847 617 791 905 794 754 911 911 955 671 744 675 731 675 562 679 745 950

[21] 637 649 662 759 553 539 849 653 950 617 976 655 598 947 878 617 604 785 555 768

[41] 510 523 992 996 786 515 502 911 538 580 801 638 736 579 613 958 751 639 897 984

[61] 722 549 682 732 962 760 581 703 829 527 573 970 650 942 564 511 718 511 803 520

[81] 696 847 845 639 928 963 707 630 773 892 511 749 926 994 890 972 810 953 852 646

[101] 510 797 565 659 518 737 779 612 910 634 670 906 730 919 854 801 995 753 603 593

[121] 582 995 950 633 996 579 994

1. Identify the index positions in y of the values which are > 700?

> which(y>700)

[1] 2 5 6 10 12 14 15 16 19 20 22 26 37 38 48 51 53 56 60 62

[21] 68 70 74 76 77 80 89 91 98 100 107 109 113 119 120 121 130 135 139 143

[41] 149 155 158 159 164 166 168 170 171 173 174 178 181 186 187 188 190 196 203 204

[61] 207 212 213 214 216 225 226 227 233 238 241 249

1. What are the values in x which are in Same index position to the values in y which are > 400?

x[which(y>400)]

[1] 257 468 483 546 170 882 398 762 669 359 690 535 710 538 420 171 770 549 695 889

[21] 180 629 865 827 780 884 207 307 330 198 235 274 591 253 123 229 597 211 647 960

[41] 676 445 357 455 445 245 694 412 327 572 966 661 624 856 774 834 91 982 733 300

[61] 733 906 209 358 906 517 125 30 771 41 971 11 80 965 37 200 840 396 392 472

[81] 101 237 579 16 42 463 629 143 122 728 19 505 169 606 815 843 788 19 568 161

[101] 162 709 761 857 437 417 585 824 326 653 288 348 123 108 838 202 963 660 298 119

[121] 120 956 913 823 877 800 611 344 751 218 292 631 269 658 76 71 370 297 369 845

[141] 299 701 946 219 712 61

1. How many values in y are within 200 of the maximum value of the terms in y?

y[(max(y) < 200)]

integer(0)

> y

[1] 301 956 389 371 843 847 319 132 617 791 338 905 197 794 754 911 322 86 911 955

[21] 671 744 440 115 675 731 483 171 675 262 341 210 16 376 562 679 745 950 163 324

[41] 132 637 330 649 302 71 662 759 553 539 849 653 950 617 492 976 490 655 598 947

[61] 368 878 454 496 460 617 604 785 555 768 404 510 523 992 429 996 786 515 502 911

[81] 264 173 400 538 244 375 580 208 801 638 736 438 579 256 463 168 613 958 478 751

[101] 20 170 639 164 354 186 897 237 984 21 107 244 722 32 549 682 300 388 732 962

[121] 760 581 462 356 383 205 138 389 266 703 407 265 400 197 829 527 395 573 970 650

[141] 333 331 942 381 564 511 138 239 718 297 511 277 360 437 803 520 696 847 845 391

[161] 153 639 287 928 155 963 1 707 630 773 892 511 749 926 91 496 197 994 36 217

[181] 890 118 369 162 166 972 810 953 399 852 64 302 490 646 510 797 565 353 659 239

[201] 265 518 737 779 114 612 910 634 274 352 670 906 730 919 382 854 54 253 367 360

[221] 280 388 348 278 801 995 753 603 593 582 238 454 995 82 51 493 53 950 633 269

[241] 996 358 371 330 104 579 333 3 994 369

> max(y)

[1] 996

1. How many numbers in x are divisible by 2?

x[which (round(x/2)==(x/2))]

[1] 552 56 468 812 370 546 170 624 882 280 398 762 204 690 710 538 748 420 770 488

[21] 928 348 954 180 130 330 780 884 330 198 274 960 676 694 412 572 966 624 856 774

[41] 834 982 248 300 906 358 448 906 30 570 684 836 806 80 238 916 726 200 840 396

[61] 392 472 352 28 860 738 16 472 42 908 122 728 950 926 138 606 788 698 568 480

[81] 162 26 824 326 458 606 288 674 348 108 838 992 202 660 298 120 788 956 800 72

[101] 344 218 292 892 744 36 568 600 658 76 370 620 946 772 716 664 706 712 660

1. Sort the numbers in the vector x in the order of increasing values in y.

x[order(y)]

[1] 26 41 348 327 535 238 458 399 381 892 992 491 620 357 793 279 836 319 748 717

[21] 370 330 995 950 815 89 674 989 361 185 389 389 881 599 684 280 497 957 28 248

[41] 928 606 701 551 43 788 37 806 744 448 277 459 860 369 551 772 72 926 951 568

[61] 480 199 916 307 603 437 812 204 130 777 706 87 673 660 624 488 600 421 599 570

[81] 583 716 138 36 457 463 923 279 56 664 577 954 908 355 352 726 439 552 957 698

[101] 472 297 919 738 412 237 661 169 209 538 960 369 445 472 906 30 770 123 202 591

[121] 299 676 326 834 327 660 728 505 417 774 956 815 572 16 982 307 965 207 245 695

[141] 122 119 42 358 712 733 392 297 370 597 71 455 877 517 546 274 357 761 946 611

[161] 865 733 41 568 963 827 629 198 229 120 780 344 535 420 549 889 37 843 101 709

[181] 19 80 218 171 200 906 913 710 180 585 771 76 762 884 396 694 857 823 445 856

[201] 170 398 298 300 269 606 123 579 468 19 483 788 330 838 631 647 288 437 971 882

[221] 751 800 669 359 91 292 824 161 143 211 629 235 701 108 690 257 125 840 162 463

[241] 348 253 11 966 653 61 658 845 624 219

(g) Create the vector (x1 + 2x2 - x3; x2 + 2x3 -x4 ,, xn−2 + 2xn−1 - xn).

**Could not understand???**

(h) Calculate:

No Question given/missing??

4**.** Use the function paste to create the following character vectors of length 30:

(a) ("Label 1", "Label 2", ....., "Label 30").

paste("Label ",1:30,sep="")

[1] "Label 1" "Label 2" "Label 3" "Label 4" "Label 5" "Label 6" "Label 7"

[8] "Label 8" "Label 9" "Label 10" "Label 11" "Label 12" "Label 13" "Label 14"

[15] "Label 15" "Label 16" "Label 17" "Label 18" "Label 19" "Label 20" "Label 21"

[22] "Label 22" "Label 23" "Label 24" "Label 25" "Label 26" "Label 27" "Label 28"

[29] "Label 29" "Label 30"

\*Note that there is a single space between label and the number following.

(b) ("FN1", "FN2", ..., "FN30").

> paste("FN",1:30,sep="")

[1] "FN1" "FN2" "FN3" "FN4" "FN5" "FN6" "FN7" "FN8" "FN9" "FN10" "FN11"

[12] "FN12" "FN13" "FN14" "FN15" "FN16" "FN17" "FN18" "FN19" "FN20" "FN21" "FN22"

[23] "FN23" "FN24" "FN25" "FN26" "FN27" "FN28" "FN29" "FN30"

\*\*In this case, the(re is no space between fn aand the number following.

5**.** Compound interest can be computed using the formula

A = P × (1 + R/100)n, where P is the original money lent, A is what it amounts to in n years at R percent per year interest.

Write R code to calculate the amount of money owed after n years, where n changes from 1 to 15 in yearly increments, if the money lent originally is 10000 Rupees and the interest rate remains constant throughout the period at 11.5%.

prin <- P \* (1+R/100)^(0:(n-1))

> prin

[1] 10000.00 11150.00 12432.25 13861.96 15456.08 17233.53 19215.39 21425.16 23889.05

[10] 26636.29 29699.47 33114.91 36923.12 41169.28 45903.75

6) Generate the following matrices.

[,1] [,2] [,3] [,4]

[1,] 1 101 201 301

[2,] 2 102 202 302

[3,] 3 103 203 303

[4,] 4 104 204 304

[5,] 5 105 205 305

cbind(c(1:5),c(101:105),c(201:205),c(301:305))

[,1] [,2] [,3] [,4]

[1,] 1 101 201 301

[2,] 2 102 202 302

[3,] 3 103 203 303

[4,] 4 104 204 304

[5,] 5 105 205 305