B044020055黃紹瑋 HW-2

Q2.

檔案太大，我有丟CSV檔案。

Q3

|  |  |
| --- | --- |
|  | CODE |
|  |
| **1** | 1593 |
| **2** | 1597 |
| **3** | 1788 |
| **4** | 2916 |
| **5** | 3068 |
| **6** | 3115 |
| **7** | 3118 |
| **8** | 3128 |
| **9** | 3217 |
| **10** | 3228 |
| **11** | 3236 |
| **12** | 3265 |
| **13** | 3299 |
| **14** | 3310 |
| **15** | 3537 |
| **16** | 3652 |
| **17** | 3663 |
| **18** | 4121 |
| **19** | 4139 |
| **20** | 4147 |
| **21** | 4736 |
| **22** | 4747 |
| **23** | 4947 |
| **24** | 4972 |
| **25** | 5015 |
| **26** | 5201 |
| **27** | 5274 |
| **28** | 5278 |
| **29** | 5281 |
| **30** | 5310 |
| **31** | 5438 |
| **32** | 5439 |
| **33** | 5487 |
| **34** | 5512 |
| **35** | 6101 |
| **36** | 6118 |
| **37** | 6148 |
| **38** | 6150 |
| **39** | 6161 |
| **40** | 6173 |
| **41** | 6195 |
| **42** | 6242 |
| **43** | 6247 |
| **44** | 6276 |
| **45** | 6294 |
| **46** | 6298 |
| **47** | 6411 |
| **48** | 6485 |
| **49** | 6499 |
| **50** | 6554 |
| **51** | 8024 |
| **52** | 8093 |
| **53** | 8155 |
| **54** | 8354 |
| **55** | 8416 |
| **56** | 8435 |
| **57** | 8436 |
| **58** | 8446 |
| **59** | 8489 |
| **60** | 8906 |
| **61** | 8908 |
| **62** | 8924 |
| **63** | 8930 |
| **64** | 8931 |

Q4

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | **code** | | **bull\_con** | **OSC\_OVER0** | | **is\_k\_lager\_d** | | **K\_LESSTHAN20** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  | |  |  |  | | | **1** | 1597 | 1 | | 1 | 1 | 0 | | | **2** | 2916 | 1 | | 1 | 1 | 0 | | | **3** | 3115 | 1 | | 1 | 1 | 0 | | | **4** | 3118 | 1 | | 1 | 1 | 0 | | | **5** | 3217 | 1 | | 1 | 1 | 0 | | | **6** | 3310 | 1 | | 1 | 1 | 0 | | | **7** | 3537 | 1 | | 1 | 1 | 0 | | | **8** | 3652 | 1 | | 1 | 1 | 0 | | | **9** | 4121 | 1 | | 1 | 1 | 0 | | | **10** | 4139 | 1 | | 1 | 1 | 0 | | | **11** | 4747 | 1 | | 1 | 1 | 0 | | | **12** | 4972 | 1 | | 1 | 1 | 0 | | | **13** | 5015 | 1 | | 1 | 1 | 0 | | | **14** | 5201 | 1 | | 1 | 1 | 0 | | | **15** | 5310 | 1 | | 1 | 1 | 0 | | | **16** | 5438 | 1 | | 1 | 1 | 0 | | | **17** | 5439 | 1 | | 1 | 1 | 0 | | | **18** | 5487 | 1 | | 1 | 1 | 0 | | | **19** | 5512 | 1 | | 1 | 1 | 0 | | | **20** | 6101 | 1 | | 1 | 1 | 0 | | | **21** | 6118 | 1 | | 1 | 1 | 0 | | | **22** | 6148 | 1 | | 1 | 1 | 0 | | | **23** | 6411 | 1 | | 1 | 1 | 0 | | | **24** | 6485 | 1 | | 1 | 1 | 0 | | | **25** | 8024 | 1 | | 1 | 1 | 0 | | | **26** | 8354 | 1 | | 1 | 1 | 0 | | | **27** | 8416 | 1 | | 1 | 1 | 0 | | | **28** | 8435 | 1 | | 1 | 1 | 0 | | | **29** | 8906 | 1 | | 1 | 1 | 0 | | |

Q 5-1

| **groupnum** | | **Ind** | **countbull** | | **totalnum** | **rate** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | |  |  |  |
| **1** | 1 | 2 | | 0 | 1 | 0.000000 |
| **2** | 1 | 3 | | 0 | 1 | 0.000000 |
| **3** | 1 | 4 | | 0 | 3 | 0.000000 |
| **4** | 1 | 5 | | 0 | 6 | 0.000000 |
| **5** | 1 | 14 | | 0 | 4 | 0.000000 |
| **6** | 1 | 15 | | 0 | 1 | 0.000000 |
| **7** | 1 | 16 | | 0 | 6 | 0.000000 |
| **8** | 1 | 18 | | 0 | 2 | 0.000000 |
| **9** | 1 | 20 | | 0 | 9 | 0.000000 |
| **10** | 1 | 21 | | 0 | 2 | 0.000000 |
| **11** | 1 | 22 | | 0 | 15 | 0.000000 |
| **12** | 1 | 24 | | 0 | 6 | 0.000000 |
| **13** | 1 | 25 | | 0 | 7 | 0.000000 |
| **14** | 1 | 26 | | 0 | 8 | 0.000000 |
| **15** | 1 | 27 | | 0 | 15 | 0.000000 |
| **16** | 1 | 28 | | 0 | 8 | 0.000000 |
| **17** | 1 | 29 | | 0 | 3 | 0.000000 |
| **18** | 1 | 30 | | 0 | 1 | 0.000000 |
| **19** | 1 | 31 | | 0 | 8 | 0.000000 |
| **20** | 1 | 32 | | 0 | 9 | 0.000000 |
| **21** | 1 | 33 | | 0 | 1 | 0.000000 |
| **22** | 1 | 34 | | 0 | 1 | 0.000000 |
| **23** | 2 | 2 | | 0 | 1 | 0.000000 |
| **24** | 2 | 4 | | 0 | 1 | 0.000000 |
| **25** | 2 | 5 | | 0 | 6 | 0.000000 |
| **26** | 2 | 10 | | 0 | 2 | 0.000000 |
| **27** | 2 | 14 | | 0 | 3 | 0.000000 |
| **28** | 2 | 15 | | 0 | 2 | 0.000000 |
| **29** | 2 | 16 | | 0 | 4 | 0.000000 |
| **30** | 2 | 17 | | 0 | 1 | 0.000000 |
| **31** | 2 | 18 | | 0 | 2 | 0.000000 |
| **32** | 2 | 20 | | 0 | 8 | 0.000000 |
| **33** | 2 | 21 | | 0 | 1 | 0.000000 |
| **34** | 2 | 22 | | 0 | 17 | 0.000000 |
| **35** | 2 | 23 | | 0 | 1 | 0.000000 |
| **36** | 2 | 24 | | 0 | 11 | 0.000000 |
| **37** | 2 | 25 | | 0 | 5 | 0.000000 |
| **38** | 2 | 26 | | 0 | 10 | 0.000000 |
| **39** | 2 | 27 | | 0 | 6 | 0.000000 |
| **40** | 2 | 28 | | 0 | 21 | 0.000000 |
| **41** | 2 | 30 | | 0 | 3 | 0.000000 |
| **42** | 2 | 31 | | 0 | 7 | 0.000000 |
| **43** | 2 | 32 | | 0 | 4 | 0.000000 |
| **44** | 2 | 34 | | 0 | 2 | 0.000000 |
| **45** | 3 | 2 | | 0 | 1 | 0.000000 |
| **46** | 3 | 3 | | 0 | 1 | 0.000000 |
| **47** | 3 | 4 | | 0 | 3 | 0.000000 |
| **48** | 3 | 5 | | 0 | 7 | 0.000000 |
| **49** | 3 | 6 | | 0 | 2 | 0.000000 |
| **50** | 3 | 10 | | 0 | 3 | 0.000000 |
| **51** | 3 | 14 | | 1 | 8 | 12.500000 |
| **52** | 3 | 15 | | 0 | 2 | 0.000000 |
| **53** | 3 | 16 | | 0 | 2 | 0.000000 |
| **54** | 3 | 17 | | 0 | 2 | 0.000000 |
| **55** | 3 | 18 | | 1 | 3 | 33.333333 |
| **56** | 3 | 20 | | 1 | 7 | 14.285714 |
| **57** | 3 | 22 | | 0 | 7 | 0.000000 |
| **58** | 3 | 24 | | 0 | 5 | 0.000000 |
| **59** | 3 | 25 | | 1 | 9 | 11.111111 |
| **60** | 3 | 26 | | 0 | 9 | 0.000000 |
| **61** | 3 | 27 | | 0 | 11 | 0.000000 |
| **62** | 3 | 28 | | 0 | 15 | 0.000000 |
| **63** | 3 | 29 | | 0 | 4 | 0.000000 |
| **64** | 3 | 30 | | 0 | 3 | 0.000000 |
| **65** | 3 | 31 | | 1 | 8 | 12.500000 |
| **66** | 3 | 32 | | 0 | 1 | 0.000000 |
| **67** | 3 | 34 | | 0 | 2 | 0.000000 |
| **68** | 4 | 2 | | 0 | 1 | 0.000000 |
| **69** | 4 | 4 | | 0 | 3 | 0.000000 |
| **70** | 4 | 5 | | 0 | 7 | 0.000000 |
| **71** | 4 | 10 | | 0 | 1 | 0.000000 |
| **72** | 4 | 14 | | 0 | 4 | 0.000000 |
| **73** | 4 | 15 | | 0 | 1 | 0.000000 |
| **74** | 4 | 16 | | 0 | 4 | 0.000000 |
| **75** | 4 | 18 | | 1 | 2 | 50.000000 |
| **76** | 4 | 20 | | 0 | 8 | 0.000000 |
| **77** | 4 | 21 | | 0 | 5 | 0.000000 |
| **78** | 4 | 22 | | 3 | 15 | 20.000000 |
| **79** | 4 | 24 | | 2 | 16 | 12.500000 |
| **80** | 4 | 25 | | 0 | 6 | 0.000000 |
| **81** | 4 | 26 | | 0 | 9 | 0.000000 |
| **82** | 4 | 27 | | 0 | 6 | 0.000000 |
| **83** | 4 | 28 | | 1 | 15 | 6.666667 |
| **84** | 4 | 29 | | 0 | 2 | 0.000000 |
| **85** | 4 | 30 | | 2 | 5 | 40.000000 |
| **86** | 4 | 31 | | 0 | 7 | 0.000000 |
| **87** | 4 | 32 | | 0 | 3 | 0.000000 |
| **88** | 4 | 33 | | 0 | 1 | 0.000000 |
| **89** | 4 | 34 | | 1 | 1 | 100.000000 |
| **90** | 5 | 2 | | 0 | 2 | 0.000000 |
| **91** | 5 | 3 | | 1 | 3 | 33.333333 |
| **92** | 5 | 5 | | 1 | 13 | 7.692308 |
| **93** | 5 | 10 | | 2 | 8 | 25.000000 |
| **94** | 5 | 11 | | 0 | 1 | 0.000000 |
| **95** | 5 | 14 | | 0 | 4 | 0.000000 |
| **96** | 5 | 16 | | 0 | 3 | 0.000000 |
| **97** | 5 | 17 | | 0 | 5 | 0.000000 |
| **98** | 5 | 18 | | 0 | 3 | 0.000000 |
| **99** | 5 | 20 | | 3 | 14 | 21.428571 |
| **100** | 5 | 21 | | 0 | 4 | 0.000000 |
| **101** | 5 | 22 | | 9 | 22 | 40.909091 |
| **102** | 5 | 23 | | 2 | 3 | 66.666667 |
| **103** | 5 | 24 | | 6 | 36 | 16.666667 |
| **104** | 5 | 25 | | 6 | 21 | 28.571429 |
| **105** | 5 | 26 | | 3 | 17 | 17.647059 |
| **106** | 5 | 27 | | 2 | 11 | 18.181818 |
| **107** | 5 | 28 | | 8 | 51 | 15.686275 |
| **108** | 5 | 29 | | 1 | 6 | 16.666667 |
| **109** | 5 | 30 | | 2 | 8 | 25.000000 |
| **110** | 5 | 31 | | 1 | 12 | 8.333333 |
| **111** | 5 | 32 | | 2 | 6 | 33.333333 |

Q 5-2

|  | **Ind** | **groupnum** | | | **avg\_avg\_ret** | | **avg\_std** | | **avg\_Sharpe\_Ratio** | **Count\_num** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | |  | |  | |  |
| **1** | 2 | 1 | -1.0559300914 | | 0.33655712 | | -3.1374469393 | | 6 |
| **2** | 2 | 2 | -0.3116209552 | | 0.38694770 | | -0.8053309337 | | 6 |
| **3** | 2 | 3 | -0.1755716360 | | 0.33515064 | | -0.5238588738 | | 6 |
| **4** | 2 | 4 | 0.0262847464 | | 0.32804635 | | 0.0801250988 | | 6 |
| **5** | 2 | 5 | 0.9545590350 | | 0.35226735 | | 2.7097573582 | | 6 |
| **6** | 3 | 1 | -0.8527240710 | | 0.30886160 | | -2.7608613893 | | 5 |
| **7** | 3 | 2 | 0.1571373699 | | 0.30872323 | | 0.5089910803 | | 5 |
| **8** | 3 | 3 | 0.4446722192 | | 0.24681767 | | 1.8016223132 | | 5 |
| **9** | 3 | 4 | -0.0163096141 | | 0.23066788 | | -0.0707060466 | | 5 |
| **10** | 3 | 5 | 1.1000777354 | | 0.29194166 | | 3.7681423081 | | 5 |
| **11** | 4 | 1 | -0.8442882140 | | 0.38573700 | | -2.1887664556 | | 10 |
| **12** | 4 | 2 | 0.2235021336 | | 0.39142378 | | 0.5709978401 | | 10 |
| **13** | 4 | 3 | 0.1756863432 | | 0.35201437 | | 0.4990885481 | | 10 |
| **14** | 4 | 4 | -0.1496732349 | | 0.30902065 | | -0.4843470374 | | 10 |
| **15** | 4 | 5 | 1.3383397523 | | 0.34514054 | | 3.8776660047 | | 10 |
| **16** | 5 | 1 | -0.4394764356 | | 0.26949603 | | -1.6307343588 | | 39 |
| **17** | 5 | 2 | -0.1045580150 | | 0.27246955 | | -0.3837420127 | | 39 |
| **18** | 5 | 3 | 0.2039319983 | | 0.28922471 | | 0.7050988088 | | 39 |
| **19** | 5 | 4 | 0.2193136911 | | 0.29652513 | | 0.7396124984 | | 39 |
| **20** | 5 | 5 | 0.8939625712 | | 0.38478778 | | 2.3232613053 | | 39 |
| **21** | 6 | 1 | -0.5720713318 | | 0.22432609 | | -2.5501773764 | | 2 |
| **22** | 6 | 2 | -0.4624935962 | | 0.25701452 | | -1.7994842930 | | 2 |
| **23** | 6 | 3 | -0.0937496954 | | 0.26967086 | | -0.3476448872 | | 2 |
| **24** | 6 | 4 | 0.9261175080 | | 0.30064398 | | 3.0804458322 | | 2 |
| **25** | 6 | 5 | 0.9566191356 | | 0.46864004 | | 2.0412663426 | | 2 |
| **26** | 10 | 1 | -0.5887184412 | | 0.21566026 | | -2.7298420802 | | 14 |
| **27** | 10 | 2 | -0.1256851808 | | 0.20806684 | | -0.6040615502 | | 14 |
| **28** | 10 | 3 | -0.0223248575 | | 0.23599510 | | -0.0945988195 | | 14 |
| **29** | 10 | 4 | 0.2303212186 | | 0.26122193 | | 0.8817070682 | | 14 |
| **30** | 10 | 5 | 0.9804600954 | | 0.36640839 | | 2.6758669461 | | 14 |
| **31** | 11 | 1 | -0.1520706130 | | 0.11089474 | | -1.3713059444 | | 1 |
| **32** | 11 | 2 | 0.3818677277 | | 0.09270648 | | 4.1191048701 | | 1 |
| **33** | 11 | 3 | 0.1637877121 | | 0.13448202 | | 1.2179153590 | | 1 |
| **34** | 11 | 4 | 0.3226787707 | | 0.20665821 | | 1.5614127782 | | 1 |
| **35** | 11 | 5 | 0.3956111213 | | 0.13584094 | | 2.9123114237 | | 1 |
| **36** | 14 | 1 | -0.7039295109 | | 0.18069236 | | -3.8957347378 | | 23 |
| **37** | 14 | 2 | -0.0644033043 | | 0.18544995 | | -0.3472813263 | | 23 |
| **38** | 14 | 3 | 0.0944731525 | | 0.26129558 | | 0.3615566458 | | 23 |
| **39** | 14 | 4 | 0.0900257491 | | 0.24082448 | | 0.3738230836 | | 23 |
| **40** | 14 | 5 | 0.8923317358 | | 0.34073894 | | 2.6188135328 | | 23 |
| **41** | 15 | 1 | -0.7969398105 | | 0.21417281 | | -3.7210130762 | | 6 |
| **42** | 15 | 2 | -0.1981181368 | | 0.17501160 | | -1.1320285828 | | 6 |
| **43** | 15 | 3 | 0.0978581096 | | 0.16574122 | | 0.5904271206 | | 6 |
| **44** | 15 | 4 | 0.3302523115 | | 0.16012906 | | 2.0624134013 | | 6 |
| **45** | 15 | 5 | 0.1523521969 | | 0.18038261 | | 0.8446057937 | | 6 |
| **46** | 16 | 1 | -1.0941777557 | | 0.30131270 | | -3.6313695645 | | 19 |
| **47** | 16 | 2 | -0.2467461776 | | 0.30184209 | | -0.8174677480 | | 19 |
| **48** | 16 | 3 | 0.1501670535 | | 0.30185032 | | 0.4974884686 | | 19 |
| **49** | 16 | 4 | 0.1274452776 | | 0.35463272 | | 0.3593725833 | | 19 |
| **50** | 16 | 5 | 0.9254456524 | | 0.40001880 | | 2.3135053934 | | 19 |
| **51** | 17 | 1 | -0.2406530506 | | 0.13060051 | | -1.8426655065 | | 8 |
| **52** | 17 | 2 | -0.0659901996 | | 0.15939564 | | -0.4140025501 | | 8 |
| **53** | 17 | 3 | 0.3286696310 | | 0.22440900 | | 1.4646009661 | | 8 |
| **54** | 17 | 4 | 0.1076298334 | | 0.19890201 | | 0.5411198901 | | 8 |
| **55** | 17 | 5 | 0.7017064470 | | 0.29657977 | | 2.3659956902 | | 8 |
| **56** | 18 | 1 | -0.5295167991 | | 0.23403565 | | -2.2625476453 | | 12 |
| **57** | 18 | 2 | -0.0414530083 | | 0.18278566 | | -0.2267847895 | | 12 |
| **58** | 18 | 3 | -0.0125309980 | | 0.19483216 | | -0.0643168870 | | 12 |
| **59** | 18 | 4 | -0.0132697513 | | 0.20055460 | | -0.0661652814 | | 12 |
| **60** | 18 | 5 | 0.6164601101 | | 0.24705152 | | 2.4952694957 | | 12 |
| **61** | 20 | 1 | -0.7684658722 | | 0.24948013 | | -3.0802688756 | | 46 |
| **62** | 20 | 2 | 0.0000687871 | | 0.27770522 | | 0.0002476983 | | 46 |
| **63** | 20 | 3 | 0.0830389164 | | 0.28106350 | | 0.2954453982 | | 46 |
| **64** | 20 | 4 | 0.1084614467 | | 0.30640389 | | 0.3539819553 | | 46 |
| **65** | 20 | 5 | 0.8363587415 | | 0.37230470 | | 2.2464361902 | | 46 |
| **66** | 21 | 1 | -0.6642186035 | | 0.22830446 | | -2.9093544183 | | 12 |
| **67** | 21 | 2 | 0.0285095437 | | 0.21974346 | | 0.1297401263 | | 12 |
| **68** | 21 | 3 | -0.1158837683 | | 0.29484940 | | -0.3930269809 | | 12 |
| **69** | 21 | 4 | 0.0950069282 | | 0.31146377 | | 0.3050336451 | | 12 |
| **70** | 21 | 5 | 0.7880242443 | | 0.33280619 | | 2.3678172457 | | 12 |
| **71** | 22 | 1 | -0.7239669267 | | 0.26446164 | | -2.7375120846 | | 76 |
| **72** | 22 | 2 | -0.1523561099 | | 0.26325838 | | -0.5787322254 | | 76 |
| **73** | 22 | 3 | 0.0153255670 | | 0.29427834 | | 0.0520784750 | | 76 |
| **74** | 22 | 4 | 0.1002747867 | | 0.30338436 | | 0.3305206156 | | 76 |
| **75** | 22 | 5 | 0.7749766001 | | 0.36289594 | | 2.1355339701 | | 76 |
| **76** | 23 | 1 | -0.5254672951 | | 0.15527462 | | -3.3841158644 | | 4 |
| **77** | 23 | 2 | -0.1224142727 | | 0.18276982 | | -0.6697729173 | | 4 |
| **78** | 23 | 3 | -0.2354423725 | | 0.14728672 | | -1.5985308703 | | 4 |
| **79** | 23 | 4 | 1.1726613116 | | 0.20037465 | | 5.8523437475 | | 4 |
| **80** | 23 | 5 | 0.9179195012 | | 0.22482494 | | 4.0828187932 | | 4 |
| **81** | 24 | 1 | -0.8524826638 | | 0.36179594 | | -2.3562527122 | | 74 |
| **82** | 24 | 2 | -0.2370460070 | | 0.35057783 | | -0.6761580064 | | 74 |
| **83** | 24 | 3 | 0.4226176272 | | 0.39746629 | | 1.0632791807 | | 74 |
| **84** | 24 | 4 | 0.1298008935 | | 0.43040172 | | 0.3015807980 | | 74 |
| **85** | 24 | 5 | 1.6071515557 | | 0.51203229 | | 3.1387699468 | | 74 |
| **86** | 25 | 1 | -0.5754629123 | | 0.27824861 | | -2.0681609830 | | 48 |
| **87** | 25 | 2 | -0.1285828129 | | 0.31091121 | | -0.4135676307 | | 48 |
| **88** | 25 | 3 | 0.1113248803 | | 0.33171962 | | 0.3355993249 | | 48 |
| **89** | 25 | 4 | 0.1526688991 | | 0.35639670 | | 0.4283678803 | | 48 |
| **90** | 25 | 5 | 1.3720692008 | | 0.48225551 | | 2.8451083977 | | 48 |
| **91** | 26 | 1 | -0.9179321036 | | 0.35257403 | | -2.6035159305 | | 53 |
| **92** | 26 | 2 | -0.3243023175 | | 0.30826329 | | -1.0520302928 | | 53 |
| **93** | 26 | 3 | -0.0745465035 | | 0.34407125 | | -0.2166600761 | | 53 |
| **94** | 26 | 4 | 0.1123140940 | | 0.38971352 | | 0.2881965565 | | 53 |
| **95** | 26 | 5 | 1.2494322212 | | 0.51985779 | | 2.4034115426 | | 53 |
| **96** | 27 | 1 | -0.8756309746 | | 0.32079187 | | -2.7295921268 | | 49 |
| **97** | 27 | 2 | -0.2830226867 | | 0.29240231 | | -0.9679221996 | | 49 |
| **98** | 27 | 3 | -0.0122995795 | | 0.33718384 | | -0.0364773700 | | 49 |
| **99** | 27 | 4 | -0.0107126491 | | 0.33912671 | | -0.0315889274 | | 49 |
| **100** | 27 | 5 | 0.8816883113 | | 0.42145955 | | 2.0919879755 | | 49 |
| **101** | 28 | 1 | -0.8088672413 | | 0.32078337 | | -2.5215372889 | | 110 |
| **102** | 28 | 2 | 0.1068356847 | | 0.33135137 | | 0.3224241522 | | 110 |
| **103** | 28 | 3 | -0.0190561220 | | 0.36155419 | | -0.0527061291 | | 110 |
| **104** | 28 | 4 | 0.2872549071 | | 0.37341760 | | 0.7692591604 | | 110 |
| **105** | 28 | 5 | 1.1450792328 | | 0.44464867 | | 2.5752449119 | | 110 |
| **106** | 29 | 1 | -1.4120371891 | | 0.33237927 | | -4.2482709508 | | 16 |
| **107** | 29 | 2 | -0.0148064265 | | 0.27688310 | | -0.0534753711 | | 16 |
| **108** | 29 | 3 | -0.2315237107 | | 0.27775865 | | -0.8335427442 | | 16 |
| **109** | 29 | 4 | 0.1553093800 | | 0.32624514 | | 0.4760511622 | | 16 |
| **110** | 29 | 5 | 1.2145237205 | | 0.44644039 | | 2.7204611069 | | 16 |
| **111** | 30 | 1 | -0.8461120990 | | 0.25573311 | | -3.3085746751 | | 20 |
| **112** | 30 | 2 | -0.2091499226 | | 0.27011377 | | -0.7743030706 | | 20 |
| **113** | 30 | 3 | 0.3278251662 | | 0.27460194 | | 1.1938195595 | | 20 |
| **114** | 30 | 4 | 0.2238698173 | | 0.31587390 | | 0.7087316059 | | 20 |
| **115** | 30 | 5 | 1.5196731829 | | 0.46429307 | | 3.2730903720 | | 20 |
| **116** | 31 | 1 | -0.7437971791 | | 0.28197641 | | -2.6377993461 | | 42 |
| **117** | 31 | 2 | -0.1793837729 | | 0.26903753 | | -0.6667611395 | | 42 |
| **118** | 31 | 3 | -0.0090033273 | | 0.30427238 | | -0.0295896957 | | 42 |
| **119** | 31 | 4 | 0.2098870998 | | 0.34387506 | | 0.6103586043 | | 42 |
| **120** | 31 | 5 | 0.9142726130 | | 0.38832099 | | 2.3544249277 | | 42 |
| **121** | 32 | 1 | -0.8668397943 | | 0.35748904 | | -2.4248010100 | | 23 |
| **122** | 32 | 2 | -0.0374783519 | | 0.34518531 | | -0.1085745866 | | 23 |
| **123** | 32 | 3 | -0.0550937335 | | 0.36153123 | | -0.1523899689 | | 23 |
| **124** | 32 | 4 | -0.0220059931 | | 0.39271052 | | -0.0560361693 | | 23 |
| **125** | 32 | 5 | 1.1750225912 | | 0.47859746 | | 2.4551375508 | | 23 |
| **126** | 33 | 1 | -0.4652306423 | | 0.19448083 | | -2.3921670657 | | 2 |
| **127** | 33 | 2 | -0.9147956499 | | 0.16925263 | | -5.4049125917 | | 2 |
| **128** | 33 | 3 | -0.0476273721 | | 0.15497725 | | -0.3073184775 | | 2 |
| **129** | 33 | 4 | 0.2520462901 | | 0.20365258 | | 1.2376287721 | | 2 |
| **130** | 33 | 5 | 0.9683266519 | | 0.38124647 | | 2.5398967115 | | 2 |
| **131** | 34 | 1 | -1.0237848502 | | 0.36715043 | | -2.7884615461 | | 6 |
| **132** | 34 | 2 | -0.4701564824 | | 0.30963464 | | -1.5184234120 | | 6 |
| **133** | 34 | 3 | -0.0102402332 | | 0.39711325 | | -0.0257866825 | | 6 |
| **134** | 34 | 4 | -0.2721214517 | | 0.37674262 | | -0.7223006741 | | 6 |
| **135** | 34 | 5 | 1.5227568855 | | 0.50079648 | | 3.0406701243 | | 6 |
| **136** | 91 | 1 | -2.0758932663 | | 0.64523124 | | -3.2172857400 | | 1 |
| **137** | 91 | 2 | -5.1837237766 | | 0.94372206 | | -5.4928500688 | | 1 |
| **138** | 91 | 3 | -1.1165485804 | | 0.52907449 | | -2.1103806874 | | 1 |
| **139** | 91 | 4 | 0.1299210145 | | 0.33428642 | | 0.3886517828 | | 1 |
| **140** | 91 | 5 | 1.7698624046 | | 0.43076573 | | 4.1086425152 | | 1 |

Q 5-3

|  | **Ind** |  | **groupnum** | **avg\_ret** | **avg\_std** | **avg\_Sharpe\_Ratio** | **Count\_num** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 23 | |  |  |  |  |  |
| **1** | 4 | 1.172661 | 0.2003746 | 5.852344 | 4 |

Q 5-4

|  | **Ind** | **groupnum** | | **avg\_Cum\_ret** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| **1** | 2  2  2  2  2  3  3  3  3  3  4  4  4  4  4  5  5  5  5  5  6  6  6  6  6  10  10  10  10  10  11  11  11  11  11  14  14  14  14  14  15  15  15  15  15  16  16  16  16  16  17  17  17  17  17  18  18  18  18  18  20  20  20  20  20  21  21  21  21  21  22  22  22  22  22  23  23  23  23  23  24  24  24  24  24  25  25  25  25  25  26  26  26  26  26  27  27  27  27  27  28  28  28  28  28  29  29  29  29  29  30  30  30  30  30  31  31  31  31  31  32  32  32  32  32  33  33  33  33  33  34  34  34  34  34  91  91  91  91  91 | 1 | | -0.65525941 |
| **2** | 2 | | -1.05247914 |
| **3** | 3 | | -0.81327137 |
| **4** | 4 | | -0.86250511 |
| **5** | 5 | | -0.93326780 |
| **6** | 1 | | 4.16538955 |
| **7** | 2 | | 3.71681909 |
| **8** | 3 | | 3.77473442 |
| **9** | 4 | | 4.51635035 |
| **10** | 5 | | 3.97750146 |
| **11** | 1 | | 3.45615158 |
| **12** | 2 | | 2.83731578 |
| **13** | 3 | | 3.10362607 |
| **14** | 4 | | 3.04321913 |
| **15** | 5 | | 3.35453819 |
| **16** | 1 | | 4.18090233 |
| **17** | 2 | | 4.39997861 |
| **18** | 3 | | 4.31745037 |
| **19** | 4 | | 4.48274153 |
| **20** | 5 | | 4.45298530 |
| **21** | 1 | | 2.07470749 |
| **22** | 2 | | 2.33509266 |
| **23** | 3 | | 1.89382884 |
| **24** | 4 | | 2.50651406 |
| **25** | 5 | | 2.21747942 |
| **26** | 1 | | 1.69794615 |
| **27** | 2 | | 1.90410283 |
| **28** | 3 | | 1.87366956 |
| **29** | 4 | | 1.71143074 |
| **30** | 5 | | 1.87683937 |
| **31** | 1 | | 3.83779311 |
| **32** | 2 | | 3.83779311 |
| **33** | 3 | | 3.83779311 |
| **34** | 4 | | 3.83779311 |
| **35** | 5 | | 3.83779311 |
| **36** | 1 | | 1.07525726 |
| **37** | 2 | | 0.87201094 |
| **38** | 3 | | 1.04964580 |
| **39** | 4 | | 0.98102401 |
| **40** | 5 | | 1.07057098 |
| **41** | 1 | | -1.63159751 |
| **42** | 2 | | -1.64105627 |
| **43** | 3 | | -1.64435543 |
| **44** | 4 | | -1.68996279 |
| **45** | 5 | | -1.83647794 |
| **46** | 1 | | -0.15661664 |
| **47** | 2 | | -0.18793784 |
| **48** | 3 | | -0.15706332 |
| **49** | 4 | | -0.09016406 |
| **50** | 5 | | -0.12266805 |
| **51** | 1 | | 2.84332993 |
| **52** | 2 | | 2.82970681 |
| **53** | 3 | | 2.91877383 |
| **54** | 4 | | 2.70687341 |
| **55** | 5 | | 2.94000276 |
| **56** | 1 | | 0.10163392 |
| **57** | 2 | | 0.07036026 |
| **58** | 3 | | 0.18340817 |
| **59** | 4 | | -0.11171791 |
| **60** | 5 | | 0.25359276 |
| **61** | 1 | | 1.44570276 |
| **62** | 2 | | 1.45455434 |
| **63** | 3 | | 1.54916417 |
| **64** | 4 | | 1.44860197 |
| **65** | 5 | | 1.52249552 |
| **66** | 1 | | 1.14072227 |
| **67** | 2 | | 0.96666431 |
| **68** | 3 | | 1.23128797 |
| **69** | 4 | | 1.10768534 |
| **70** | 5 | | 1.06018451 |
| **71** | 1 | | 0.44069145 |
| **72** | 2 | | 0.44712280 |
| **73** | 3 | | 0.43548059 |
| **74** | 4 | | 0.43172420 |
| **75** | 5 | | 0.46555600 |
| **76** | 1 | | 3.98625707 |
| **77** | 2 | | 3.79225741 |
| **78** | 3 | | 4.21488651 |
| **79** | 4 | | 3.43344235 |
| **80** | 5 | | 4.54757939 |
| **81** | 1 | | 4.70934746 |
| **82** | 2 | | 4.72450368 |
| **83** | 3 | | 4.75409086 |
| **84** | 4 | | 4.78840203 |
| **85** | 5 | | 4.79298180 |
| **86** | 1 | | 8.13502781 |
| **87** | 2 | | 8.15314457 |
| **88** | 3 | | 8.33055166 |
| **89** | 4 | | 8.15524642 |
| **90** | 5 | | 8.37095340 |
| **91** | 1 | | 1.26469012 |
| **92** | 2 | | 1.27266911 |
| **93** | 3 | | 1.27550204 |
| **94** | 4 | | 1.27987749 |
| **95** | 5 | | 1.32613187 |
| **96** | 1 | | -0.59667004 |
| **97** | 2 | | -0.61147033 |
| **98** | 3 | | -0.64935804 |
| **99** | 4 | | -0.63464617 |
| **100** | 5 | | -0.60422932 |
| **101** | 1 | | 3.75349537 |
| **102** | 2 | | 3.74773390 |
| **103** | 3 | | 3.75491250 |
| **104** | 4 | | 3.79907692 |
| **105** | 5 | | 3.82438093 |
| **106** | 1 | | 1.70538795 |
| **107** | 2 | | 1.84288728 |
| **108** | 3 | | 1.68494217 |
| **109** | 4 | | 1.69975546 |
| **110** | 5 | | 1.79885190 |
| **111** | 1 | | 3.48571476 |
| **112** | 2 | | 3.54674535 |
| **113** | 3 | | 3.61097249 |
| **114** | 4 | | 3.48559066 |
| **115** | 5 | | 3.55264550 |
| **116** | 1 | | 1.71742335 |
| **117** | 2 | | 1.65795693 |
| **118** | 3 | | 1.63632025 |
| **119** | 4 | | 1.66344255 |
| **120** | 5 | | 1.76488589 |
| **121** | 1 | | 1.35250422 |
| **122** | 2 | | 1.17603974 |
| **123** | 3 | | 1.44103761 |
| **124** | 4 | | 1.27197535 |
| **125** | 5 | | 1.44792318 |
| **126** | 1 | | -1.04960349 |
| **127** | 2 | | -1.25373970 |
| **128** | 3 | | -1.05564355 |
| **129** | 4 | | -0.99793251 |
| **130** | 5 | | -1.23024171 |
| **131** | 1 | | 0.15384085 |
| **132** | 2 | | 0.13055047 |
| **133** | 3 | | 0.25959610 |
| **134** | 4 | | 0.13548330 |
| **135** | 5 | | 0.21705965 |
| **136** | 1 | | -11.85296587 |
| **137** | 2 | | -11.85296587 |
| **138** | 3 | | -11.85296587 |
| **139** | 4 | | -11.85296587 |
| **140** | 5 | | -11.85296587 |