

**Results for Bladder cancer
BioConsert Project – February 2011**

GS=Gold Standard, BI=Bioggle, IE= In Edge, PR = Page Rank and PC = Path Count

Here IE and PC provide the same input ranking.

Using reduced data sets only

a. Rankings given as input

GS=[[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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308]]:

BI=[[1], [4], [185], [8], [184], [3], [2, 32], [104, 149], [88], [14, 55, 93, 182, 210], [7, 20, 30, 42, 44, 48, 54, 94, 95, 96, 195, 276, 287], [56, 118], [10], [5], [192], [164], [235], [169], [201], [106], [119, 307], [16], [89], [90, 109], [6, 19, 256], [34, 49, 91, 110, 152, 158, 199, 241, 242, 290, 292], [22, 60, 61, 87, 92, 102, 103, 107, 108, 146, 147, 148, 162, 198, 200, 243, 262, 281, 291], [13, 46, 47, 66, 186, 206, 269, 289], [15], [9, 18, 23, 24, 25, 33, 38, 45, 57, 58, 62, 63, 84, 97, 98, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 187, 188, 194, 204, 207, 216, 217, 239, 240, 244, 246, 257, 263, 273, 274, 277, 279, 282, 283, 285, 297, 308], [26, 27, 36, 37, 51, 154, 176, 177, 178, 247], [82, 105, 141], [101], [156], [166, 167, 231], [12, 233], [81, 161, 165, 168, 170, 219, 220, 221, 224, 227, 234, 237, 259, 260], [11, 50, 163, 171, 172, 190, 191, 205, 218, 222, 223, 225, 226, 228,

229, 230, 232, 236, 238, 298], [265, 266, 267, 268], [21, 35, 43, 52, 53, 79, 80, 114, 117, 139, 179, 180, 196, 208, 258, 261, 270, 271, 275, 284, 305, 306], [28, 29, 31, 39, 40, 41, 59, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 99, 100, 115, 116, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 140, 150, 173, 189, 193, 197, 209, 245, 248, 249, 250, 251, 252, 253, 254, 255, 264, 272, 278, 280, 288, 304], [155], [142, 175, 181, 202, 203, 286], [17, 83, 85, 86], [211, 212, 213, 214, 215], [293, 294, 295, 296], [299, 300, 301, 302, 303]]:

IE:=[[3, 184, 185], [1, 2, 4, 5, 7, 8, 10, 14, 20, 30, 32, 42, 44, 48, 54, 55, 93, 94, 95, 96, 182, 195, 201, 210, 276, 287], [16, 56, 88, 104, 106, 118, 119, 149, 164, 169, 192, 235, 307], [101], [15, 82, 105, 141], [6, 9, 13, 18, 19, 23, 24, 25, 33, 38, 45, 46, 47, 57, 58, 62, 63, 66, 84, 89, 90, 97, 98, 109, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 256, 257, 263, 265, 266, 267, 268, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308], [11, 12, 17, 21, 22, 26, 27, 28, 29, 31, 34, 35, 36, 37, 39, 40, 41, 43, 49, 50, 51, 52, 53, 59, 60, 61, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 85, 86, 87, 91, 92, 99, 100, 102, 103, 107, 108, 110, 114, 115, 116, 117, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 142, 146, 147, 148, 150, 152, 154, 155, 156, 158, 161, 162, 163, 165, 166, 167, 168, 170, 171, 172, 173, 175, 176, 177, 178, 179, 180, 181, 189, 190, 191, 193, 196, 197, 198, 199, 200, 202, 203, 205, 208, 209, 211, 212, 213, 214, 215, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 236, 237, 238, 241, 242, 243, 245, 247, 248, 249, 250, 251, 252, 253, 254, 255, 258, 259, 260, 261, 262, 264, 270, 271, 272, 275, 278, 280, 281, 284, 286, 288, 290, 291, 292, 293, 294, 295, 296, 298, 299, 300, 301, 302, 303, 304, 305, 306]]:

PR:=[[1], [4], [185], [2], [3], [8, 184], [7, 14, 30, 42, 48, 95, 96, 182, 195, 210, 276, 287], [32], [44, 54], [55, 93, 94], [20, 118], [5], [6], [56], [192], [9, 13, 18, 19, 23, 24, 26, 27, 37, 38, 45, 46, 47, 57, 58, 62, 63, 66, 84, 97, 98, 105, 111, 112, 143, 144, 145, 151, 153, 154, 157, 159, 160, 174, 176, 177, 178, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 257, 263, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308], [15, 82, 141], [25, 33, 113], [256], [106], [90, 109], [35, 51, 53, 275, 284], [10], [101], [201], [88, 104, 149], [36, 43], [164, 169, 235], [156], [114], [142, 196, 286, 293, 294, 295, 296], [211, 212, 213, 214, 215], [79, 80, 139, 247, 258, 305], [89], [16], [299, 300, 301, 302, 303], [175, 202, 203], [22, 34, 49, 60, 61, 87, 91, 92, 102, 103, 107, 108, 110, 146, 147, 148, 152, 158, 162, 198, 199, 200, 241, 242, 243, 262, 281, 290, 291, 292], [21, 52, 117, 179, 208, 261, 270, 271, 306], [11, 12, 50, 81, 161, 163, 165, 166, 167, 168, 170, 171, 172, 190, 191, 205, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 236, 237, 238, 259, 260, 298], [83, 85, 86], [181], [119, 307], [17, 180], [265, 266, 268], [267], [28, 29, 31, 39, 40, 41, 59, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 99, 100, 115, 116, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 140, 150, 173, 189, 193, 197, 209, 245, 248, 249, 250, 251, 252, 253, 254, 255, 264, 272, 278, 280,

288, 304], [155]]:

PC:=[[3, 184, 185], [1, 2, 4, 5, 7, 8, 10, 14, 20, 30, 32, 42, 44, 48, 54, 55, 93, 94, 95, 96, 182, 195, 201, 210, 276, 287], [16, 56, 88, 104, 106, 118, 119, 149, 164, 169, 192, 235, 307], [101], [15, 82, 105, 141], [6, 9, 13, 18, 19, 23, 24, 25, 33, 38, 45, 46, 47, 57, 58, 62, 63, 66, 84, 89, 90, 97, 98, 109, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 256, 257, 263, 265, 266, 267, 268, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308], [11, 12, 17, 21, 22, 26, 27, 28, 29, 31, 34, 35, 36, 37, 39, 40, 41, 43, 49, 50, 51, 52, 53, 59, 60, 61, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 85, 86, 87, 91, 92, 99, 100, 102, 103, 107, 108, 110, 114, 115, 116, 117, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 142, 146, 147, 148, 150, 152, 154, 155, 156, 158, 161, 162, 163, 165, 166, 167, 168, 170, 171, 172, 173, 175, 176, 177, 178, 179, 180, 181, 189, 190, 191, 193, 196, 197, 198, 199, 200, 202, 203, 205, 208, 209, 211, 212, 213, 214, 215, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 236, 237, 238, 241, 242, 243, 245, 247, 248, 249, 250, 251, 252, 253, 254, 255, 258, 259, 260, 261, 262, 264, 270, 271, 272, 275, 278, 280, 281, 284, 286, 288, 290, 291, 292, 293, 294, 295, 296, 298, 299, 300, 301, 302, 303, 304, 305, 306]]:

a. Results

Using BioConsert

Med3:=[[1], [4], [185], [3], [8, 184], [2, 32], [7, 14, 20, 30, 42, 44, 48, 54, 55, 93, 94, 95, 96, 182, 195, 210, 276, 287], [5], [56, 118], [10], [192], [201], [106], [88, 104, 149], [164, 169, 235], [16], [119, 307], [6], [105], [15], [90, 109], [9, 13, 18, 19, 23, 24, 25, 33, 38, 45, 46, 47, 57, 58, 62, 63, 66, 84, 97, 98, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 257, 263, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308], [82, 141], [256], [101], [89], [22, 26, 27, 34, 36, 37, 49, 51, 60, 61, 87, 91, 92, 102, 103, 107, 108, 110, 146, 147, 148, 152, 154, 158, 162, 176, 177, 178, 198, 199, 200, 241, 242, 243, 247, 262, 281, 290, 291, 292], [156], [11, 12, 21, 35, 43, 50, 52, 53, 79, 80, 81, 114, 117, 139, 161, 163, 165, 166, 167, 168, 170, 171, 172, 179, 190, 191, 196, 205, 208, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 236, 237, 238, 258, 259, 260, 261, 270, 271, 275, 284, 298, 305, 306], [265, 266, 267, 268], [142, 180, 286], [17, 28, 29, 31, 39, 40, 41, 59, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 83, 85, 86, 99, 100, 115, 116, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 140, 150, 155, 173, 175, 181, 189, 193, 197, 202, 203, 209, 211, 212, 213, 214, 215, 245, 248, 249, 250, 251, 252, 253, 254, 255, 264, 272, 278, 280, 288, 293, 294, 295, 296, 299, 300, 301, 302, 303, 304]];

Distance to [BI, IE, PR]=23379

Using Fagin's approach

Fagin1:=

[[1],[4],[185],[3],[184],[8],[2],[14],[182],[210],[7],[30],[32],[42],[48],[55],[93],[95],[96],[195],[276],[287],[44],[54],[20],[94],[5],[56],[118],[10],[192],[88],[104],[149],[164],[235],[169],[201],[106],[119],[307],[16],[6],[19],[105],[9],[13],[18],[23],[24],[38],[45],[46],[47],[57],[58],[62],[63],[66],[84],[89],[90],[97],[98],[109],[111],[112],[143],[144],[145],[151],[153],[157],[159],[160],[174],[183],[186],[187],[188],[194],[204],[206],[207],[216],[217],[239],[240],[244],[246],[256],[257],[263],[269],[273],[274],[277],[279],[282],[283],[285],[289],[297],[308],[15],[82],[141],[25],[33],[113],[101],[26],[27],[36],[37],[51],[154],[176],[177],[178],[247],[156],[22],[34],[49],[60],[61],[87],[91],[92],[102],[103],[107],[108],[110],[146],[147],[148],[152],[158],[162],[198],[199],[200],[241],[242],[243],[262],[281],[290],[291],[292],[265],[266],[267],[268],[11],[12],[21],[35],[43],[50],[52],[53],[79],[80],[81],[114],[117],[139],[142],[161],[163],[165],[166],[167],[168],[170],[171],[172],[175],[179],[180],[190],[191],[196],[202],[203],[205],[208],[211],[212],[213],[214],[215],[218],[219],[220],[221],[222],[223],[224],[225],[226],[227],[228],[229],[230],[231],[232],[233],[234],[236],[237],[238],[258],[259],[260],[261],[270],[271],[275],[284],[286],[293],[294],[295],[296],[298],[299],[300],[301],[302],[303],[305],[306],[83],[85],[86],[181],[17],[28],[29],[31],[39],[40],[41],[59],[64],[65],[67],[68],[69],[70],[71],[72],[73],[74],[75],[76],[77],[78],[99],[100],[115],[116],[120],[121],[122],[123],[124],[125],[126],[127],[128],[129],[130],[131],[132],[133],[134],[135],[136],[137],[138],[140],[150],[173],[189],[193],[197],[209],[245],[248],[249],[250],[251],[252],[253],[254],[255],[264],[272],[278],[280],[288],[304],[155]];

Distance to [BI, IE, PR]=41313

Fagin2:=[[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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308]]

Distance to [BI, IE, PR]= 109875

Fagin 3:=[[1], [2, 3, 4, 7, 8, 14, 30, 32, 42, 48, 55, 182, 184, 185, 210], [93, 95], [5, 10, 20, 44, 54, 56, 94, 96, 118, 192, 195, 276, 287], [88, 104, 149], [6, 16, 106, 119, 164, 169, 201, 235, 307], [9, 13, 18, 19, 23, 24, 38, 45, 46, 47, 57, 58, 105], [62, 63, 66, 84,

89, 90, 97, 98], [109], [111, 112, 143, 144, 145, 151], [153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206], [207, 216, 217, 239, 240, 244, 246, 256, 257, 263, 269, 273, 274, 277, 279, 282, 283, 285], [15, 289, 297, 308], [25, 26, 27, 33, 36, 37, 51, 82, 101, 113, 141, 154], [22, 34, 156, 176, 177, 178, 247], [49, 60, 61, 87, 91, 92, 102, 103, 107, 108, 110], [146, 147, 148, 152, 158, 162, 198, 199, 200, 241, 242], [243, 262, 281, 290], [11, 12, 265, 266, 267, 268, 291, 292], [21, 35, 43, 50, 52, 53, 79, 80, 81, 114, 117, 139, 142, 161], [163, 165, 166, 167, 168, 170, 171, 172], [175, 179, 180, 190, 191, 196, 202], [203, 205, 208, 211, 212, 213, 214, 215, 218], [219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233], [234, 236], [237, 238, 258, 259, 260, 261, 270, 271], [275], [284, 286, 293, 294, 295, 296, 298, 299], [17, 28, 29, 31, 39, 40, 41, 83, 85, 86, 181, 300, 301, 302, 303, 305, 306], [59, 64, 65, 67, 68, 69, 70, 71, 72], [73, 74, 75, 76, 77], [78, 99, 100, 115, 116, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130], [131, 132, 133, 134, 135, 136, 137, 138, 140, 150, 173, 189, 193, 197, 209, 245, 248], [155, 249, 250, 251, 252, 253, 254, 255, 264, 272, 278, 280, 288, 304]]

Distance to [BI, IE, PR]= 38867

1. Reduced data sets

a. Rankings given as input

GS_c:=[[1, 2], [3, 4, 5], [6, 7, 8], [9, 10, 13, 14, 15, 16, 18, 19, 20, 23, 24, 25, 30, 32, 33, 38, 42, 44, 45, 46, 47, 48, 54, 55, 56, 57, 58, 62, 63, 66, 82, 84, 88, 89, 90, 93, 94, 95, 96, 97, 98, 101, 104, 105, 106, 109, 111, 112, 113, 118, 119, 141, 143, 144, 145, 149, 151, 153, 157, 159, 160, 164, 169, 174, 182, 183, 184, 185, 186, 187, 188, 192, 194, 195, 201, 204, 206, 207, 210, 216, 217, 235, 239, 240, 244, 246, 256, 257, 263, 265, 266, 267, 268, 269, 273, 274, 276, 277, 279, 282, 283, 285, 287, 289, 297, 307, 308]]

BI_c:=[[1], [4], [185], [8], [184], [3], [2, 32], [104, 149], [88], [14, 55, 93, 182, 210], [7, 20, 30, 42, 44, 48, 54, 94, 95, 96, 195, 276, 287], [56, 118], [10], [5], [192], [164], [235], [169], [201], [106], [119, 307], [16], [89], [90, 109], [6, 19, 256], [13, 46, 47, 66, 186, 206, 269, 289], [15], [9, 18, 23, 24, 25, 33, 38, 45, 57, 58, 62, 63, 84, 97, 98, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 187, 188, 194, 204, 207, 216, 217, 239, 240, 244, 246, 257, 263, 273, 274, 277, 279, 282, 283, 285, 297, 308], [82, 105, 141], [101], [265, 266, 267, 268]]

IE_c:=[[3, 184, 185], [1, 2, 4, 5, 7, 8, 10, 14, 20, 30, 32, 42, 44, 48, 54, 55, 93, 94, 95, 96, 182, 195, 201, 210, 276, 287], [16, 56, 88, 104, 106, 118, 119, 149, 164, 169, 192, 235, 307], [101], [15, 82, 105, 141], [6, 9, 13, 18, 19, 23, 24, 25, 33, 38, 45, 46, 47, 57, 58, 62, 63, 66, 84, 89, 90, 97, 98, 109, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 256, 257, 263, 265, 266, 267, 268, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308]]

PR_c:=[[1], [4], [185], [2], [3], [8, 184], [7, 14, 30, 42, 48, 95, 96, 182, 195, 210, 276, 287], [32], [44, 54], [55, 93, 94], [20, 118], [5], [6], [56], [192], [9, 13, 18, 19, 23, 24, 38,

45, 46, 47, 57, 58, 62, 63, 66, 84, 97, 98, 105, 111, 112, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 257, 263, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308], [15, 82, 141], [25, 33, 113], [256], [106], [90, 109], [10], [101], [201], [88, 104, 149], [164, 169, 235], [89], [16], [119, 307], [265, 266, 268], [267]]

PC_c:=[[3, 184, 185], [1, 2, 4, 5, 7, 8, 10, 14, 20, 30, 32, 42, 44, 48, 54, 55, 93, 94, 95, 96, 182, 195, 201, 210, 276, 287], [16, 56, 88, 104, 106, 118, 119, 149, 164, 169, 192, 235, 307], [101], [15, 82, 105, 141], [6, 9, 13, 18, 19, 23, 24, 25, 33, 38, 45, 46, 47, 57, 58, 62, 63, 66, 84, 89, 90, 97, 98, 109, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 256, 257, 263, 265, 266, 267, 268, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308]]

a. Results

Using BioConsert

M4:=[[1], [4], [185], [3], [8], [184], [2, 32], [7, 14, 20, 30, 42, 44, 48, 54, 55, 93, 94, 95, 96, 182, 195, 210, 276, 287], [5], [56, 118], [10], [192], [201], [106], [88, 104, 149], [164, 169, 235], [16, 119, 307], [6], [15, 105], [9, 13, 18, 19, 23, 24, 25, 33, 38, 45, 46, 47, 57, 58, 62, 63, 66, 84, 97, 98, 111, 112, 113, 143, 144, 145, 151, 153, 157, 159, 160, 174, 183, 186, 187, 188, 194, 204, 206, 207, 216, 217, 239, 240, 244, 246, 257, 263, 269, 273, 274, 277, 279, 282, 283, 285, 289, 297, 308], [82, 141], [90, 109, 256], [101], [89], [265, 266, 267, 268]];

Distance to [BI_c, IE_c, PR_c]= 3174

Using Fagin's approach

Fagin1 := [[1], [4], [185], [3], [184], [8], [2], [14], [182], [210], [7], [30], [32], [42], [48], [55], [93], [95], [96], [195], [276], [287], [44], [54], [20], [94], [5], [56], [118], [10], [192], [88], [104], [149], [164], [235], [169], [201], [106], [119], [307], [16], [6], [15], [13], [19], [46], [47], [66], [105], [186], [206], [269], [289], [9], [18], [23], [24], [25], [33], [38], [45], [57], [58], [62], [63], [84], [89], [90], [97], [98], [109], [111], [112], [113], [143], [144], [145], [151], [153], [157], [159], [160], [174], [183], [187], [188], [194], [204], [207], [216], [217], [239], [240], [244], [246], [256], [257], [263], [273], [274], [277], [279], [282], [283], [285], [297], [308], [82], [141], [101], [265], [266], [267], [268]]

Distance to [BI_c, IE_c, PR_c]=15217

Fagin2:=[[1], [2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 18, 19, 20, 23, 24, 25, 30, 32, 33, 38, 42, 44, 45, 46, 47, 48, 54, 55, 56, 57, 58, 62, 63, 66, 82, 84, 88, 89, 90, 93, 94, 95, 96, 97, 98, 101, 104, 105, 106, 109, 111, 112, 113, 118, 119, 141, 143, 144, 145, 149, 151, 153, 157, 159, 160, 164, 169, 174, 182, 183, 184, 185, 186, 187, 188, 192, 194, 195, 201, 204, 206, 207, 210, 216, 217, 235, 239, 240, 244, 246, 256, 257, 263, 265, 266, 267, 268, 269, 273, 274, 276, 277, 279, 282, 283, 285, 287, 289, 297, 307, 308]]

Distance to [Bl_c, IE_c, PR_c]= 13643

Fagin3:=[[1], [2, 3, 4, 7, 8, 14, 30, 32, 42, 182, 184, 185, 210], [48, 55, 93, 95, 96], [5, 10, 20, 44, 54, 56, 88, 94, 104, 118, 149, 192, 195, 276, 287], [6, 13, 15, 16, 106, 119, 164, 169, 201, 235, 307], [19, 46, 47, 66, 105, 186, 206, 269, 289], [9, 18, 23], [24, 25, 33, 38, 45, 57, 58, 62, 63, 84, 89, 90], [97, 98, 109, 111], [112, 113, 143, 144], [145, 151, 153, 157, 159, 160, 174, 183, 187, 188], [194], [204, 207, 216, 217, 239, 240, 244, 246, 256], [82, 257, 263, 273, 274, 277, 279, 282, 283, 285, 297, 308], [101, 141, 265, 266, 267, 268]]

Distance to [Bl_c, IE_c, PR_c]= 7083