

ภาคผนวก

ภาคผนวก

ชุดข้อมูลที่นำมาทดสอบ

ในการจัดกลุ่มข้อมูลซึ่งถือว่าเป็นการเรียนรู้แบบไม่มีตัวชี้แนะ หรือ unsupervised learning คือชุดข้อมูลที่นำมาทดสอบจะต้องไม่มี label หรือติดชื่อกลุ่มออก ซึ่งประกอบไปด้วยชุดข้อมูลทั้งหมด 6 ชุด คือ

1. ชุดข้อมูล Ruspini แบบคงที่

ประกอบไปด้วยข้อมูลทั้งหมด 75 ตัว มี 2 คุณลักษณะ และแบ่งออกได้เป็น 4 กลุ่ม

4, 53;
5, 63;
10, 59;
9, 77;
13, 49;
13, 69;
12, 88;
15, 75;
18, 61;
19, 65;
22, 74;
27, 72;
28, 76;
24, 58;
27, 55;
28, 60;
30, 52;
31, 60;
32, 61;
36, 72;
28, 147;
32, 149;
35, 153;
33, 154;
38, 151;
41, 150;
38, 145;
38, 143;
32, 143;
34, 141;
44, 156;
44, 149;
44, 143;
46, 142;
47, 149;
49, 152;
50, 142;

53,144;
 52,152;
 55,155;
 54,124;
 60,136;
 63,139;
 86,132;
 85,115;
 85,96;
 78,94;
 74,96;
 97,122;
 98,116;
 98,124;
 99,119;
 99,128;
 101,115;
 108,111;
 110,111;
 108,116;
 111,126;
 115,117;
 117,115;
 70,4;
 77,12;
 83,21;
 61,15;
 69,15;
 78,16;
 66,18;
 58,13;
 64,20;
 69,21;
 66,23;
 61,25;
 76,27;
 72,31;
 64,30;

2. ชุดข้อมูล Ruspini แบบไม่คงที่

โดยเพิ่ม Gaussian noise เข้าไปในชุดข้อมูล Ruspini แบบคงที่

3. ชุดข้อมูลของมะเร็งปอด (Breast cancer)

ประกอบไปด้วยข้อมูลทั้งหมด 683 ตัว มี 9 คุณลักษณะ และแบ่งออกได้เป็น 2 กลุ่ม

4.05,	0.05,	0.48,	0.13,	1.46,	0.79,	2.14,	0.83,	0.93;
4.86,	3.9,	3.14,	4.73,	6.04,	9.62,	2.25,	1.34,	0.81;
2.48,	0.09,	0.11,	0.4,	1.94,	1.98,	2.56,	0.87,	0.73;
5.33,	7.14,	7.96,	0.29,	2.12,	3.1,	2.78,	6.68,	0.79;
3.13,	0.09,	0.74,	2.49,	1.51,	0.61,	2.43,	0.8,	0.36;
7.34,	9.81,	9.85,	7.29,	6.37,	9.07,	8.38,	6.46,	0.32;
0.41,	0.27,	0.94,	0.1,	1.84,	9.55,	2.35,	0.88,	0.47;
1.44,	0.64,	1.47,	0.42,	1.4,	0.29,	2.61,	0.87,	0.87;
1.38,	0.04,	0.56,	0.17,	1.26,	0.82,	0.76,	1,	4.67;
3.15,	1.17,	0.16,	0.88,	1.56,	0.69,	1.59,	0.78,	0.54;
0.19,	0.56,	0.47,	0.74,	0.63,	0.04,	2.77,	0.43,	0.55;
1.11,	0.02,	0.88,	0.09,	1.68,	0.31,	1.33,	0.68,	0.65;
4.16,	2.74,	2.96,	2.93,	1.35,	2.83,	3.82,	3.6,	0.68;
0.09,	0.33,	0.46,	0.11,	1.35,	2.75,	2.17,	0.84,	0.31;
7.3,	6.99,	4.95,	9.35,	6.06,	8.73,	4.56,	4.83,	3.04;
6.96,	3.76,	5.22,	3.18,	5.6,	0.04,	3.92,	2.8,	0.75;
3.74,	0.25,	0.55,	0.42,	1.33,	0.14,	1.39,	0.51,	0.76;
3.37,	0.62,	0.66,	0.56,	1.11,	0.49,	2.64,	0.8,	0.17;
9.64,	6.9,	6.08,	5.22,	3.62,	9.08,	3.25,	0.98,	1.94;
5.23,	0.69,	0.57,	0.47,	1.06,	0.9,	2.87,	0.1,	0.45;
6.03,	2.47,	1.64,	9.15,	4.48,	9.86,	4.43,	3.58,	3.73;
9.18,	4.07,	4.49,	2.83,	5.19,	6.42,	6.16,	9.94,	0.15;
2.21,	0.53,	0.61,	0.41,	1.17,	0.83,	1.77,	0.54,	0.3;
0.37,	0.69,	0.35,	0.74,	1.01,	0.09,	2.86,	0.95,	0.22;
4.29,	1.95,	2.16,	3.34,	1.75,	6.34,	2.98,	5.22,	0.24;
2.15,	1.78,	0.88,	0.19,	0.09,	0.55,	1.47,	0.7,	0.12;
4.06,	0.52,	0.2,	0.93,	1.54,	0.07,	1.99,	0.1,	0.41;
1.68,	0.44,	0.41,	0.57,	1.62,	0.35,	1.38,	0.92,	0.11;
0,	0.63,	2.93,	0.11,	1.88,	0.88,	0.53,	0.18,	0.94;
2.66,	0.93,	1,	0.66,	0.83,	0.39,	1.93,	0.1,	0.78;
1.52,	0.5,	0.25,	0.23,	1.58,	0.98,	2.49,	0.49,	0.09;
9.34,	6.05,	6.54,	2.02,	7.06,	4.78,	6.16,	3.58,	2.53;
1.49,	0.91,	0.97,	1.46,	1.91,	0.92,	2.03,	0.15,	0.02;
2.78,	0.55,	1.3,	0.61,	1.83,	0.88,	1.69,	0.92,	0.35;
1.28,	0.17,	0.17,	0.26,	1.9,	0.53,	1.74,	0.03,	0.61;
9.67,	9.95,	9.97,	7.14,	5.18,	0.38,	7.97,	8.08,	0.33;
5.67,	1.79,	0.45,	0.64,	0.79,	0.58,	6.04,	0.35,	0.59;
4.61,	3.53,	3.89,	8.69,	1.22,	9.81,	4.1,	5.88,	0.45;
1.4,	4.19,	2.37,	2.11,	5.27,	6.64,	6.75,	4.33,	0.62;
9.97,	3.37,	2.44,	0.03,	2.77,	2.19,	5.89,	5,	1.42;
5.44,	9.31,	9.42,	1.45,	7.27,	9.61,	6.74,	2.73,	2.06;
4.88,	5.6,	4.2,	5.01,	9.88,	0.78,	2.62,	0.27,	0.81;
9.59,	9.79,	9.79,	3.55,	7.73,	0.45,	7.05,	9.06,	0.95;
0.93,	0.59,	0,	0.13,	1.73,	0.31,	1.43,	0.54,	1.19;
2.74,	6.46,	6.9,	3.35,	3.68,	8.9,	4,	7.66,	0.71;
0.29,	0.06,	0.57,	0.99,	1.07,	0.96,	1.22,	0.3,	0.83;
3.29,	0.58,	0.04,	2.03,	1.8,	0.23,	2.89,	0.18,	0.19;
6.61,	7.18,	6.12,	1.57,	3.68,	7.71,	2.66,	7.26,	1.98;
8.53,	4.21,	7.36,	0.32,	1.24,	2.33,	1.59,	0.05,	4.94;
4.45,	2.5,	2.49,	3.6,	1.68,	3.32,	2.91,	3.55,	0.89;
9.68,	2.67,	5.46,	1.36,	2.14,	4.12,	3.8,	9.76,	1.52;
4.46,	4.89,	4.07,	7.32,	9.84,	7.69,	6.13,	2.06,	6.52;

9.75, 4.12, 4.35, 5.99, 7.19, 7.41, 6.43, 0.28, 0.12;
 9.48, 5.27, 5.01, 2.96, 3.84, 4.25, 2.92, 5.76, 0.54;
 7.65, 9.24, 9.48, 0.19, 2.66, 5.71, 2.96, 8.4, 0.53;
 7.29, 1.11, 3.42, 0.07, 4.63, 0.25, 4.17, 3.76, 3.11;
 4.66, 1.91, 2.22, 0.28, 5.07, 9.36, 4.67, 0.76, 0.9;
 8.59, 4, 4.37, 1.85, 1.02, 1.11, 4.36, 0.17, 0.21;
 4.64, 2.59, 4.29, 4.05, 2.67, 2.69, 3.02, 9.56, 0.83;
 0.41, 0.07, 0.87, 0.37, 1.51, 1.4, 1.92, 0.43, 0.86;
 8.34, 9.18, 10, 0.77, 9.2, 7.72, 2.99, 2.85, 0.51;
 5.93, 2.82, 3.82, 0.67, 4.48, 1.46, 2.32, 8.54, 0.46;
 1, 0.26, 0.69, 0.6, 1.18, 0.91, 1.18, 0.81, 0.85;
 9.17, 3.95, 1.8, 0.09, 2.95, 1.16, 3.49, 2.36, 9.13;
 3.43, 0.28, 0.2, 0.08, 1.12, 0.48, 2.28, 0.92, 0.65;
 4.12, 2.07, 3.7, 0.43, 7.22, 9.28, 3.68, 8.65, 0.53;
 7.8, 2.45, 7.79, 2.44, 3.53, 8.57, 7.46, 8.1, 7.65;
 0.02, 0.53, 0.31, 0.19, 1.34, 0.66, 2.81, 1.81, 0.44;
 4.83, 0.48, 2.88, 0.4, 1.88, 0.81, 1.52, 0.29, 0.36;
 5.58, 9.94, 1.2, 8, 9.13, 1.14, 6.94, 7.63, 9.92;
 0.61, 2.38, 2.28, 1.85, 1.29, 0.54, 6.25, 1.42, 0.95;
 8.32, 3.68, 4.37, 9.78, 5.88, 9.72, 3.57, 7.51, 0.31;
 9.94, 5.64, 3.17, 0.06, 2.89, 3.52, 2.28, 1.03, 2.55;
 0.65, 0.52, 1.11, 0.01, 1.75, 1.84, 3.87, 1.95, 1;
 0.18, 0.74, 3.91, 0.4, 1.57, 0.61, 1.96, 0.54, 0.01;
 4.22, 2.11, 0.27, 1.2, 2, 0.01, 1.02, 0.69, 0.81;
 2.72, 0.39, 0.38, 0.41, 1.77, 2.16, 2.16, 0.51, 0.91;
 1.81, 0.37, 0.92, 0.81, 2.23, 0, 1.26, 0.8, 0.08;
 1.97, 1.01, 1.76, 0.01, 0.33, 0.4, 6.04, 0.84, 0.51;
 3.73, 0.48, 0.99, 1.11, 1.41, 0.73, 1.09, 0.81, 0.93;
 4.19, 1.57, 0.99, 0.25, 1.36, 0.29, 2.01, 0.16, 0.28;
 2.69, 0.34, 0.07, 0.92, 1.25, 1.42, 6.29, 0.98, 0.45;
 2.83, 4.96, 6.01, 7.04, 7.1, 8.9, 6.81, 9.03, 6.98;
 4.46, 9.03, 5.44, 0.5, 9.11, 3.29, 3.96, 9.12, 9.88;
 2.76, 2.44, 5.12, 3.48, 4.55, 7.73, 3.41, 3.75, 0.19;
 2.24, 5.85, 5.32, 5.56, 4.99, 9.69, 5.92, 7.65, 2.85;
 3.39, 0.17, 0.93, 0.88, 1.57, 0.65, 2.65, 0.02, 0.02;
 1.53, 0.41, 0.66, 1.17, 2.61, 0.87, 1.66, 0.5, 0.92;
 0.23, 0.64, 0.25, 0.89, 1.5, 0.77, 2.75, 0.06, 0.67;
 2.31, 0.09, 0.59, 1.31, 1.89, 0.85, 0.14, 0.96, 0.43;
 3.08, 0.54, 0.81, 0.31, 1.39, 0.15, 2.59, 0.13, 0.79;
 0.91, 0.94, 0.55, 0.36, 1.07, 0.12, 1.04, 0.91, 0.17;
 2, 0.57, 0.58, 0.19, 1.75, 0.17, 2.62, 0.32, 0.54;
 0.91, 0.05, 0.78, 0.23, 1.9, 0.92, 2.06, 0.33, 0.52;
 1.41, 0.99, 0.86, 1.32, 1.3, 0.57, 0.23, 0.86, 0.81;
 5, 0.02, 0.11, 0.16, 1.8, 0.39, 2.41, 0.08, 0.96;
 8.5, 5.89, 8.45, 1.06, 9.19, 5.59, 1.14, 8.55, 9.61;
 6.14, 4.1, 5.33, 9.73, 4.9, 9.25, 6.64, 8.96, 3.53;
 9.51, 2.96, 4.39, 0.98, 9.8, 4.81, 2.33, 9.12, 1.21;
 1.67, 2.61, 3.11, 3.27, 1.53, 4.3, 1.83, 4.47, 0.85;
 3.16, 0.11, 1.54, 0.61, 1.64, 0.58, 2.12, 0.45, 0.62;
 7.97, 1.99, 2.02, 0.93, 5.82, 2.09, 6.49, 0.98, 0.55;
 9.38, 9.53, 9.88, 9.33, 9.82, 0.78, 7.79, 7.68, 7.49;
 6.03, 2.34, 3.1, 3.8, 2.69, 2.9, 2.5, 1.54, 6.74;
 9.69, 9.24, 9.53, 7.51, 1.15, 9.43, 3.22, 0.78, 0.04;
 0.97, 5.34, 7.99, 9.44, 7.87, 9.53, 4.08, 6.25, 0.35;
 0.83, 0.5, 0.13, 0.71, 1.51, 0.76, 1.86, 2.08, 0.12;
 5.06, 4, 3.95, 3.71, 2.54, 8.72, 6.21, 7.29, 2.72;
 0.6, 2.89, 0.84, 1.45, 1.51, 1.74, 4.9, 2.67, 1.5;
 7.06, 5.31, 3.38, 2.67, 4.73, 8.91, 2.42, 0.42, 0.54;

9.47, 2.07, 2.7, 9.38, 1.32, 9.97, 6.72, 2.18, 2.63;
 9.67, 9.96, 9.27, 2.4, 9.49, 7.93, 7.9, 0.33, 0.06;
 2.34, 2.58, 1, 0.49, 1.17, 2.34, 2.88, 0.32, 0.83;
 0.69, 0.88, 0.47, 0.42, 1.51, 4.08, 0.74, 0.02, 0.09;
 7.27, 2.73, 2.31, 0.84, 1.18, 2, 2.42, 1.26, 0.67;
 3.26, 4.5, 4.2, 9.85, 3.34, 9.75, 6.19, 4.33, 7.85;
 0.45, 0.48, 0.43, 0.98, 3.46, 2.48, 0.1, 0.25, 0.24;
 2.81, 1.56, 0.98, 0.71, 1.78, 1.29, 2.52, 0.81, 0.15;
 0.01, 0.13, 1.29, 1.39, 1.83, 0.05, 2.55, 0.01, 0.85;
 3.5, 1.09, 0.43, 0.46, 1.3, 1.86, 2.91, 0.88, 0.37;
 9.59, 9.51, 9, 1.33, 9.66, 9.58, 4.29, 2.72, 2.35;
 4.85, 2.98, 4.44, 0.06, 7.32, 9.74, 4.46, 2.43, 0.87;
 4.12, 3.14, 5.24, 6.37, 8.12, 6.56, 7.59, 9.47, 0.17;
 0.73, 0.82, 0.79, 0.76, 1.68, 0.72, 1.36, 0.33, 0.1;
 6.08, 4, 2.86, 6.62, 3.87, 9.59, 6.52, 4.11, 4.89;
 2.32, 0.26, 0.51, 0.44, 1.08, 0.96, 2.97, 0.47, 0.21;
 7.05, 2.77, 4.88, 3.13, 4.98, 9, 0.11, 5.94, 1.87;
 0.99, 0.67, 0.45, 0.73, 9.04, 0.63, 0.45, 0.69, 0.06;
 4.74, 0.19, 2.33, 0.97, 1.57, 0.39, 1.05, 0.06, 0.31;
 1.97, 0.62, 0.31, 0.27, 1.4, 0.61, 2.67, 0.33, 0.21;
 4.66, 9.4, 7.81, 9.57, 7.72, 9.38, 2.05, 5.52, 2.99;
 2.64, 0.92, 0.97, 0.06, 1.6, 0.15, 1.02, 1.93, 0.28;
 2.77, 0.05, 0.31, 0.27, 2.91, 0.36, 1.59, 0.38, 0.67;
 4.09, 0.31, 0.83, 0.98, 1.43, 1.67, 2.52, 2.29, 0.56;
 3.97, 0.52, 0.76, 0.05, 1.66, 0.08, 1.92, 0.05, 0.84;
 2.49, 0.11, 0.63, 0.76, 1.87, 0.36, 0.8, 0.25, 0.96;
 3.35, 0.89, 1.8, 0.35, 1.86, 0.97, 1.48, 0.74, 0.45;
 2.4, 0.08, 0.16, 0.88, 1.09, 0.43, 0.63, 0.51, 0.57;
 1.55, 0.15, 0.31, 0.07, 1.97, 0.42, 0.74, 0.54, 0.55;
 9, 4.59, 4.05, 3.94, 3.88, 4.07, 3.95, 3, 2.98;
 0.99, 0.01, 0.72, 0.64, 1.59, 4.83, 0.6, 0.19, 0.29;
 1.85, 0.38, 0.96, 0.13, 1.28, 0.15, 1.64, 0.62, 0.42;
 2.76, 3.48, 4.16, 1.82, 5.04, 7.63, 3.81, 0.26, 0.93;
 0.49, 0.29, 0.85, 0.36, 2.01, 1.75, 1.63, 0.98, 0.65;
 2.58, 0.5, 0.95, 2.76, 7.42, 0.58, 4.23, 7.05, 0.44;
 7.41, 7.09, 6.59, 3.55, 9.56, 9.88, 6.42, 7.53, 6.74;
 0.83, 0.17, 0.68, 0.22, 0.73, 0.93, 2.36, 0.78, 0.82;
 6.15, 1.71, 3.97, 0.61, 5.55, 9.17, 4.78, 3.01, 2.82;
 9.79, 9.81, 7.04, 5.57, 3.69, 4.15, 7.33, 9.95, 0.77;
 3.84, 0.17, 0.66, 0.49, 1.55, 2.98, 0.59, 0.28, 0.2;
 0.77, 0.18, 0.64, 0.82, 1.93, 0.35, 0.76, 0.08, 0.87;
 5, 4.92, 4.65, 5.29, 2.63, 9.22, 2.81, 0.78, 0.13;
 0.89, 1.02, 1.39, 0.88, 1.56, 0.23, 1.22, 0.16, 0.83;
 1.99, 0.65, 0.94, 0.19, 1.63, 0.54, 2.46, 0.94, 0.85;
 8.75, 8.06, 9.71, 2.92, 5.61, 9.28, 6.83, 9.47, 5.62;
 9.7, 6.33, 6.17, 3.18, 4.14, 9.81, 4.43, 6.68, 1.92;
 3.58, 0.86, 0.15, 0.85, 1.1, 0.55, 2.36, 1.89, 0.33;
 2.24, 0.52, 0.06, 0.66, 1.23, 0.58, 2.97, 0.53, 0.26;
 0.94, 0.75, 0.89, 1.3, 0.47, 2.2, 0.01, 0.18, 6.03;
 3.44, 0.54, 0.65, 0.93, 1.62, 1.06, 2.93, 1.9, 0.26;
 4.64, 5.36, 6.91, 7.43, 7.41, 9.67, 2.74, 9.71, 2.31;
 9.34, 7.89, 9.79, 9.15, 5.52, 0.24, 2.42, 0.75, 9.91;
 2.82, 0.35, 0.42, 0.05, 1.38, 0.06, 2.01, 0.23, 0.01;
 0.16, 0.84, 0.38, 1.75, 0.02, 0.27, 0.77, 0.29, 0.61;
 2.68, 0.95, 0.46, 0.4, 1.88, 0.9, 0.62, 0.98, 0.92;
 0.87, 0.66, 0.83, 0.57, 1.34, 0.75, 2.65, 0.08, 0.28;
 0.17, 0.13, 0.45, 0.24, 1.44, 0.54, 1.21, 0.61, 0.84;
 5.8, 9.67, 9.81, 9.14, 7.08, 9.22, 9.97, 9.83, 6.06;

7.92, 5.34, 4.61, 3.43, 2.81, 9.25, 5.75, 0.51, 0.6;
 4.45, 7.71, 6.32, 6.92, 9.66, 9.49, 4.36, 6.21, 0.1;
 1.12, 0.28, 0.74, 0.76, 1.52, 0.87, 2.6, 0.41, 0.7;
 4.5, 9.09, 9.74, 2.22, 7.91, 0.13, 4.21, 9.03, 2.02;
 3.22, 0.73, 0.41, 0.97, 1.23, 0.2, 2.99, 0.4, 0.47;
 4.45, 2.65, 2.14, 2.37, 5.96, 9.15, 2.68, 0.5, 0.32;
 0.78, 0.52, 0.72, 0.39, 0.77, 0.1, 2.2, 0.54, 0.17;
 0.76, 0.05, 0.43, 0.85, 1.58, 0.4, 0.39, 0, 0.62;
 5.34, 0.67, 0.04, 0.07, 1.5, 0.38, 2.52, 0.41, 0.31;
 4.5, 7.89, 7.37, 7.4, 4.94, 9.59, 6.09, 7.01, 0.27;
 7.68, 6.82, 5.76, 3.85, 3.33, 9.21, 4.87, 0.96, 0.04;
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 6.08, 4.91, 9.9, 9.48, 9.48, 9.16, 3.83, 9.2, 2.59;
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 5.14, 2.55, 2.8, 2.48, 2.71, 1.46, 5.48, 0.78, 0.3;
 6.58, 0.34, 1.98, 2.54, 1.28, 0.51, 1.63, 0.98, 0.94;
 0.26, 0.68, 0.2, 0.32, 1.37, 0.57, 0.89, 0.53, 0.93;
 4.72, 0.4, 0.81, 1.85, 0.78, 0.44, 1.63, 0.36, 0.41;
 2.49, 0.14, 2.65, 0.81, 2.67, 3.79, 0.36, 0.33, 0.37;
 3.47, 5.93, 5.49, 4.41, 6.04, 5.21, 6.27, 6.93, 2.91;
 1.09, 0.79, 0.23, 0.74, 1.69, 4.75, 0.31, 0.41, 0.92;
 1.94, 0.15, 0.31, 0.73, 1.74, 0.9, 0.78, 0.44, 0.3;
 3.1, 0.2, 0.96, 0.45, 2, 0.86, 0.35, 0.71, 0.39;
 5.64, 1.16, 2.43, 0.95, 1.3, 0.79, 0.09, 0.88, 0.87;
 4.88, 0.28, 0.86, 0.19, 1.29, 0.17, 1.64, 0.18, 0.82;
 0.85, 0.85, 0.31, 0.34, 1.12, 0.78, 0.73, 0.82, 0.5;
 7.92, 6.4, 3.57, 3.07, 4.65, 2.61, 4.01, 9.5, 0.52;
 2.44, 0.89, 0.25, 0.55, 1.01, 0.7, 0.53, 0.2, 0.4;
 2.2, 0.38, 3.77, 0.72, 1.01, 0.59, 0.18, 0.14, 0.01;
 9.66, 9.74, 6.44, 7.72, 6.81, 0.1, 9.04, 9.48, 2.33;
 3.4, 1.62, 3.73, 2.34, 1.53, 1.57, 1.95, 0.53, 0.92;
 3.63, 0.06, 0.25, 0.74, 1.84, 0.36, 0.7, 0.98, 0.31;
 4.72, 0.04, 0.46, 2.62, 1.39, 0.5, 0.7, 0.86, 0.92;
 3.88, 0.27, 0.59, 2.29, 1.07, 0.9, 0.57, 0.49, 0.98;
 2.31, 0.42, 0.58, 0.67, 1.48, 0.69, 1.95, 0.87, 0.13;
 2.72, 0.34, 0.18, 0.81, 1.6, 0.63, 1.74, 0.77, 0.27;
 0.24, 0.34, 0.11, 0.12, 1.25, 0.16, 0.77, 0.28, 0.82;
 1.68, 0.35, 0.01, 0.76, 1.04, 0.26, 0.09, 0.21, 0.3;
 2.28, 0.62, 0.54, 0.4, 1.72, 1, 1.54, 0.77, 0.89;
 0.37, 1.83, 1.17, 0.11, 1.65, 0.16, 0.68, 0.39, 0.57;
 0.4, 0.91, 0.63, 2.88, 1.77, 0.12, 0.17, 0.46, 0.82;

4.23, 9.17, 9.57, 9.85, 9.79, 1.45, 9.24, 9.94, 9.12;
 2.65, 0.32, 0.31, 0.53, 1.36, 0.51, 1.4, 0.36, 0.7;
 2.93, 0.12, 0.18, 1.21, 2.87, 3.11, 0.48, 0.1, 0;
 0.15, 1.54, 0.43, 2.5, 1.19, 0.38, 1.86, 0.58, 0.16;
 4.19, 0.9, 0.94, 0.33, 1.52, 0.39, 1.01, 1.59, 0.93;
 3.26, 0.15, 0.16, 0.59, 1.39, 0.66, 1.22, 0.07, 0.9;
 2.8, 0.78, 1, 0.29, 1.79, 0.86, 2.82, 0.13, 0.96;
 2.07, 0.82, 0.12, 0.75, 1.81, 0.58, 1.92, 0.71, 0.75;
 4.73, 0.69, 0.3, 0.51, 1.65, 0.07, 1.45, 0.45, 0.98;
 4.2, 3.71, 4.45, 0.11, 7.34, 0.08, 2.17, 5.64, 0.53;
 6.49, 7.32, 7.27, 6.75, 2.02, 9.55, 6.6, 1.84, 2.4;
 0.5, 0.33, 0.27, 0.93, 1.43, 0.94, 0.98, 0.13, 0.64;
 0.2, 0.89, 0.56, 0.12, 1.78, 0.7, 1.95, 0.24, 0.09;
 3.33, 0.46, 0.86, 0.59, 1.81, 0.33, 2, 0.84, 0.75;
 0.39, 0.56, 2.5, 0.11, 1.64, 0.12, 1.36, 0.66, 0.01;
 0.15, 0.57, 2.9, 0.54, 1.96, 0.58, 1.42, 0.14, 0.51;
 2.75, 0.97, 0.49, 3, 1.25, 0.98, 1.12, 0.93, 0.26;
 0.18, 0.77, 0.05, 0.63, 1.5, 0.94, 0.6, 0.77, 0.38;
 4.06, 1.14, 1.78, 1.95, 1.5, 0.85, 0.87, 0.45, 1.18;
 2.39, 0.23, 0.05, 0.62, 1.49, 0.09, 2.1, 0.01, 0.18;
 4.49, 6.61, 3.33, 0.01, 5.57, 0.9, 6.17, 9.12, 2.77;
 4.13, 9.3, 9.16, 7.67, 4.02, 4.48, 6.13, 9.38, 0.3;
 2.54, 9.52, 6.03, 7.08, 4.47, 7.57, 6.38, 3.68, 0.7;
 2.63, 1.06, 0.34, 1.65, 1.57, 0.98, 2.05, 0.8, 0.26;
 1.97, 0.58, 0.97, 0.38, 1.55, 0.29, 2.05, 0.39, 0.02;
 4.26, 2.08, 1.96, 0.62, 2.83, 0.55, 0.21, 0.8, 0.23;
 0.88, 0.61, 0.01, 0.38, 1.62, 0.6, 1.29, 0.66, 0.05;
 3.45, 0.11, 3.93, 0.79, 1.69, 0.35, 0.57, 0, 0.34;
 0.15, 0.88, 1.15, 0.04, 1.6, 0.94, 1.2, 0.72, 0.52;
 4.25, 0.5, 0.42, 0.98, 1.02, 0.29, 0.34, 0.03, 0.54;
 0.28, 0.02, 0.25, 0.76, 1.33, 0.59, 0.05, 0.9, 0.05;
 1.08, 0.87, 0.07, 0.22, 1.55, 0.06, 0.97, 0.59, 0.46;
 9.37, 9.88, 9.34, 9.83, 4.21, 9.38, 9.36, 9.75, 6.2;
 4.64, 9.71, 9.73, 9.13, 3.45, 9.67, 4.31, 5.02, 2.63;
 4.08, 0.69, 0.14, 0.78, 1.68, 0.96, 2.62, 1.55, 0.19;
 0.68, 0.01, 0.2, 0.04, 1.29, 0.55, 0.87, 0.11, 0.91;
 1, 0.95, 0.52, 0.45, 1.17, 0.42, 0.64, 0.18, 0.07;
 0.17, 0.78, 0.31, 0.6, 1.85, 0.78, 0.27, 0.53, 0.48;
 0.54, 0.03, 0.05, 0.14, 1.85, 0.26, 0.05, 0.72, 0.74;
 2.29, 0.32, 0.78, 0.17, 1.65, 0.05, 1.59, 2.72, 0.69;
 3.86, 0.64, 0.67, 0.81, 1.52, 0.17, 0.3, 0.7, 0.28;
 0.84, 0.22, 0.4, 0.03, 1.79, 0.48, 0.14, 0.02, 7.53;
 0.86, 0.99, 0.54, 2.6, 1.49, 0.22, 0.89, 0.29, 0.82;
 4.4, 9.52, 9.2, 4.03, 3.68, 4.06, 3.73, 3.89, 0.48;
 2.99, 0.21, 0.91, 0.1, 1.92, 0.85, 0.45, 0.83, 0.33;
 2.12, 0.42, 0.13, 0.43, 1.25, 0.43, 1.41, 0.51, 1.31;
 2.89, 0.03, 0.64, 0.08, 2.7, 1.96, 0.16, 0.86, 0.58;
 1.21, 0.7, 0.13, 0.48, 1.57, 0.21, 0.95, 0.16, 0.83;
 4.36, 9.41, 9.54, 2.05, 6.3, 2.2, 7.06, 9.51, 1.8;
 3.66, 7.68, 5.79, 3.25, 2.39, 3.28, 9.27, 5.93, 0.17;
 3.91, 7.88, 8, 4.35, 3.7, 4.53, 9.25, 3.32, 1;

4. ชุดข้อมูลของดอกไอริส (Iris)

ประกอบไปด้วยข้อมูลทั้งหมด 150 ตัว มี 4 คุณลักษณะ และแบ่งออกได้เป็น 3 กลุ่ม

5.1, 3.5, 1.4, 0.2;
 4.9, 3.0, 1.4, 0.2;
 4.7, 3.2, 1.3, 0.2;
 4.6, 3.1, 1.5, 0.2;
 5.0, 3.6, 1.4, 0.2;
 5.4, 3.9, 1.7, 0.4;
 4.6, 3.4, 1.4, 0.3;
 5.0, 3.4, 1.5, 0.2;
 4.4, 2.9, 1.4, 0.2;
 4.9, 3.1, 1.5, 0.1;
 5.4, 3.7, 1.5, 0.2;
 4.8, 3.4, 1.6, 0.2;
 4.8, 3.0, 1.4, 0.1;
 4.3, 3.0, 1.1, 0.1;
 5.8, 4.0, 1.2, 0.2;
 5.7, 4.4, 1.5, 0.4;
 5.4, 3.9, 1.3, 0.4;
 5.1, 3.5, 1.4, 0.3;
 5.7, 3.8, 1.7, 0.3;
 5.1, 3.8, 1.5, 0.3;
 5.4, 3.4, 1.7, 0.2;
 5.1, 3.7, 1.5, 0.4;
 4.6, 3.6, 1.0, 0.2;
 5.1, 3.3, 1.7, 0.5;
 4.8, 3.4, 1.9, 0.2;
 5.0, 3.0, 1.6, 0.2;
 5.0, 3.4, 1.6, 0.4;
 5.2, 3.5, 1.5, 0.2;
 5.2, 3.4, 1.4, 0.2;
 4.7, 3.2, 1.6, 0.2;
 4.8, 3.1, 1.6, 0.2;
 5.4, 3.4, 1.5, 0.4;
 5.2, 4.1, 1.5, 0.1;
 5.5, 4.2, 1.4, 0.2;
 4.9, 3.1, 1.5, 0.1;
 5.0, 3.2, 1.2, 0.2;
 5.5, 3.5, 1.3, 0.2;
 4.9, 3.1, 1.5, 0.1;
 4.4, 3.0, 1.3, 0.2;
 5.1, 3.4, 1.5, 0.2;
 5.0, 3.5, 1.3, 0.3;
 4.5, 2.3, 1.3, 0.3;
 4.4, 3.2, 1.3, 0.2;
 5.0, 3.5, 1.6, 0.6;
 5.1, 3.8, 1.9, 0.4;
 4.8, 3.0, 1.4, 0.3;
 5.1, 3.8, 1.6, 0.2;
 4.6, 3.2, 1.4, 0.2;
 5.3, 3.7, 1.5, 0.2;
 5.0, 3.3, 1.4, 0.2;
 7.0, 3.2, 4.7, 1.4;
 6.4, 3.2, 4.5, 1.5;

6.9, 3.1, 4.9, 1.5;
5.5, 2.3, 4.0, 1.3;
6.5, 2.8, 4.6, 1.5;
5.7, 2.8, 4.5, 1.3;
6.3, 3.3, 4.7, 1.6;
4.9, 2.4, 3.3, 1.0;
6.6, 2.9, 4.6, 1.3;
5.2, 2.7, 3.9, 1.4;
5.0, 2.0, 3.5, 1.0;
5.9, 3.0, 4.2, 1.5;
6.0, 2.2, 4.0, 1.0;
6.1, 2.9, 4.7, 1.4;
5.6, 2.9, 3.6, 1.3;
6.7, 3.1, 4.4, 1.4;
5.6, 3.0, 4.5, 1.5;
5.8, 2.7, 4.1, 1.0;
6.2, 2.2, 4.5, 1.5;
5.6, 2.5, 3.9, 1.1;
5.9, 3.2, 4.8, 1.8;
6.1, 2.8, 4.0, 1.3;
6.3, 2.5, 4.9, 1.5;
6.1, 2.8, 4.7, 1.2;
6.4, 2.9, 4.3, 1.3;
6.6, 3.0, 4.4, 1.4;
6.8, 2.8, 4.8, 1.4;
6.7, 3.0, 5.0, 1.7;
6.0, 2.9, 4.5, 1.5;
5.7, 2.6, 3.5, 1.0;
5.5, 2.4, 3.8, 1.1;
5.5, 2.4, 3.7, 1.0;
5.8, 2.7, 3.9, 1.2;
6.0, 2.7, 5.1, 1.6;
5.4, 3.0, 4.5, 1.5;
6.0, 3.4, 4.5, 1.6;
6.7, 3.1, 4.7, 1.5;
6.3, 2.3, 4.4, 1.3;
5.6, 3.0, 4.1, 1.3;
5.5, 2.5, 4.0, 1.3;
5.5, 2.6, 4.4, 1.2;
6.1, 3.0, 4.6, 1.4;
5.8, 2.6, 4.0, 1.2;
5.0, 2.3, 3.3, 1.0;
5.6, 2.7, 4.2, 1.3;
5.7, 3.0, 4.2, 1.2;
5.7, 2.9, 4.2, 1.3;
6.2, 2.9, 4.3, 1.3;
5.1, 2.5, 3.0, 1.1;
5.7, 2.8, 4.1, 1.3;
6.3, 3.3, 6.0, 2.5;
5.8, 2.7, 5.1, 1.9;
7.1, 3.0, 5.9, 2.1;
6.3, 2.9, 5.6, 1.8;
6.5, 3.0, 5.8, 2.2;
7.6, 3.0, 6.6, 2.1;
4.9, 2.5, 4.5, 1.7;
7.3, 2.9, 6.3, 1.8;
6.7, 2.5, 5.8, 1.8;
7.2, 3.6, 6.1, 2.5;

6.5, 3.2, 5.1, 2.0;
6.4, 2.7, 5.3, 1.9;
6.8, 3.0, 5.5, 2.1;
5.7, 2.5, 5.0, 2.0;
5.8, 2.8, 5.1, 2.4;
6.4, 3.2, 5.3, 2.3;
6.5, 3.0, 5.5, 1.8;
7.7, 3.8, 6.7, 2.2;
7.7, 2.6, 6.9, 2.3;
6.0, 2.2, 5.0, 1.5;
6.9, 3.2, 5.7, 2.3;
5.6, 2.8, 4.9, 2.0;
7.7, 2.8, 6.7, 2.0;
6.3, 2.7, 4.9, 1.8;
6.7, 3.3, 5.7, 2.1;
7.2, 3.2, 6.0, 1.8;
6.2, 2.8, 4.8, 1.8;
6.1, 3.0, 4.9, 1.8;
6.4, 2.8, 5.6, 2.1;
7.2, 3.0, 5.8, 1.6;
7.4, 2.8, 6.1, 1.9;
7.9, 3.8, 6.4, 2.0;
6.4, 2.8, 5.6, 2.2;
6.3, 2.8, 5.1, 1.5;
6.1, 2.6, 5.6, 1.4;
7.7, 3.0, 6.1, 2.3;
6.3, 3.4, 5.6, 2.4;
6.4, 3.1, 5.5, 1.8;
6.0, 3.0, 4.8, 1.8;
6.9, 3.1, 5.4, 2.1;
6.7, 3.1, 5.6, 2.4;
6.9, 3.1, 5.1, 2.3;
5.8, 2.7, 5.1, 1.9;
6.8, 3.2, 5.9, 2.3;
6.7, 3.3, 5.7, 2.5;
6.7, 3.0, 5.2, 2.3;
6.3, 2.5, 5.0, 1.9;
6.5, 3.0, 5.2, 2.0;
6.2, 3.4, 5.4, 2.3;
5.9, 3.0, 5.1, 1.8;

5. ชุดข้อมูลของคลื่นเสียง (Vowel)

ประกอบไปด้วยข้อมูลทั้งหมด 871 ตัว มี 3 คุณลักษณะ และแบ่งออกได้เป็น 6 กลุ่ม

700,	1500,	2600;
550,	1550,	2400;
700,	1500,	2600;
700,	1600,	2700;
550,	1600,	2600;
600,	1250,	2700;
550,	1200,	2500;
550,	1700,	2600;
550,	1400,	2550;
600,	1600,	2600;
550,	2000,	2700;
500,	1750,	2600;
650,	1600,	2700;
550,	1800,	2600;
600,	1400,	2600;
550,	1400,	2600;
650,	1600,	2600;
550,	1700,	2600;
600,	1400,	2600;
700,	1350,	2600;
550,	1350,	2200;
600,	1400,	2200;
550,	1600,	2200;
400,	1200,	2400;
600,	1200,	2300;
600,	1350,	2300;
600,	1400,	2300;
500,	1400,	2360;
500,	1400,	2360;
550,	1300,	2300;
650,	1200,	2300;
550,	1200,	2360;
500,	1350,	2360;
500,	1200,	2300;
700,	1400,	2360;
450,	1650,	2400;
500,	1450,	2400;
700,	1550,	2360;
550,	1400,	2300;
750,	1500,	2360;
550,	1500,	2360;
500,	1500,	2360;
600,	1400,	2360;
650,	1350,	2360;
650,	1400,	2100;
650,	1350,	2100;
600,	1700,	2300;
650,	1400,	2000;
600,	1800,	2300;
750,	1350,	2100;
700,	1750,	2300;
600,	1300,	1900;

550, 1700, 2300;
 550, 1500, 2600;
 600, 1350, 2300;
 700, 1400, 2300;
 600, 1400, 2300;
 700, 1300, 2300;
 700, 1300, 2300;
 650, 1300, 2300;
 700, 1350, 2300;
 650, 1600, 2300;
 700, 1400, 2300;
 500, 1900, 2300;
 500, 1900, 2300;
 700, 1300, 2300;
 700, 1400, 2300;
 550, 1500, 2300;
 650, 1200, 2300;
 600, 1850, 2300;
 650, 1600, 2300;
 750, 1250, 2300;
 650, 1200, 2500;
 650, 1200, 2500;
 600, 1200, 2400;
 650, 1200, 2600;
 700, 1150, 2500;
 650, 1100, 2500;
 700, 1200, 2400;
 700, 1200, 2550;
 650, 1150, 2600;
 650, 1150, 2500;
 700, 1150, 2600;
 750, 1200, 2600;
 600, 1200, 2600;
 650, 1200, 2550;
 650, 1350, 2600;
 600, 1200, 2500;
 650, 1200, 2500;
 650, 1100, 2600;
 650, 1050, 2400;
 600, 1200, 2600;
 550, 1200, 2600;
 750, 1300, 2500;
 750, 1250, 2600;
 700, 1150, 2500;
 750, 1200, 2600;
 700, 1100, 2600;
 700, 1200, 2600;
 600, 1000, 2400;
 750, 1150, 2600;
 600, 1350, 2100;
 700, 1300, 2150;
 750, 1300, 2300;
 650, 1200, 2400;
 700, 1250, 2150;
 800, 1250, 2150;
 750, 1300, 2400;
 650, 1550, 2150;
 800, 1350, 2500;

800, 1300, 2400;
 600, 1350, 2150;
 650, 1200, 2300;
 750, 1250, 2400;
 650, 1300, 2400;
 700, 1150, 2500;
 600, 1550, 2500;
 700, 1300, 2500;
 650, 1250, 2400;
 600, 1200, 2400;
 700, 1300, 2200;
 750, 1300, 2200;
 700, 1300, 2200;
 700, 1200, 2200;
 700, 1200, 2200;
 600, 1050, 2200;
 600, 1100, 2200;
 750, 1200, 2200;
 750, 1250, 2200;
 750, 1250, 2200;
 750, 1300, 2200;
 750, 1250, 2150;
 750, 1300, 2200;
 750, 1250, 2200;
 700, 1100, 2200;
 750, 1300, 2300;
 750, 1200, 2200;
 750, 1300, 2200;
 700, 1200, 2100;
 800, 1350, 2200;
 700, 1200, 2200;
 800, 1300, 2200;
 700, 1250, 2200;
 750, 1350, 2200;
 700, 1250, 2200;
 700, 1300, 2200;
 750, 1100, 2200;
 700, 1200, 2200;
 700, 1200, 2100;
 800, 1200, 2200;
 750, 1400, 2400;
 750, 1150, 2200;
 750, 1250, 2200;
 750, 1300, 2200;
 750, 1250, 2200;
 750, 1300, 2200;
 750, 1200, 2200;
 700, 1600, 2200;
 700, 1250, 2200;
 700, 1300, 2200;
 600, 1500, 2200;
 300, 2100, 2600;
 300, 2100, 2750;
 300, 2000, 2500;
 350, 2200, 2800;
 300, 2200, 2700;
 300, 2050, 2600;
 350, 2150, 2700;

300, 2100, 2750;
 300, 2000, 2700;
 300, 2100, 2700;
 300, 2100, 2700;
 300, 2100, 2700;
 300, 2200, 2700;
 350, 2200, 2700;
 300, 2200, 2700;
 350, 2300, 2700;
 300, 2150, 2700;
 250, 2100, 2700;
 300, 2100, 2700;
 350, 2100, 2700;
 300, 1900, 2700;
 300, 2100, 2700;
 300, 2200, 2700;
 300, 2150, 2700;
 400, 2000, 2600;
 400, 1900, 2400;
 500, 2000, 2500;
 550, 2100, 2700;
 450, 1900, 2400;
 500, 2200, 2700;
 500, 2100, 2600;
 500, 2100, 2650;
 500, 2100, 2600;
 400, 2100, 2500;
 400, 2000, 2700;
 400, 1600, 2400;
 400, 1900, 2300;
 400, 1800, 2400;
 450, 1950, 2550;
 350, 1900, 2500;
 300, 2000, 2600;
 300, 1500, 2400;
 350, 2100, 2500;
 300, 1900, 2500;
 350, 1900, 2600;
 300, 1800, 2600;
 250, 1800, 2600;
 300, 2100, 2600;
 350, 1800, 2600;
 400, 2200, 2600;
 400, 2200, 2600;
 400, 1900, 2600;
 450, 2200, 2900;
 300, 2150, 2750;
 300, 2250, 3000;
 300, 2250, 2850;
 300, 2200, 2900;
 300, 2200, 2900;
 350, 2300, 3000;
 300, 2400, 3200;
 300, 2300, 3100;
 300, 2250, 3100;
 350, 2250, 3000;
 350, 2250, 2900;
 350, 2300, 3100;

400, 2400, 2970;
350, 2250, 2970;
300, 2200, 2970;
350, 2200, 2970;
400, 2250, 2970;
350, 2300, 2970;
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6. ชุดข้อมูลของไวน์ (Wine)

ประกอบไปด้วยข้อมูลทั้งหมด 178 ตัว มี 13 คุณลักษณะ และแบ่งออกได้เป็น 3 กลุ่ม

14.23, 1.71, 2.43, 15.6, 127, 2.8, 3.06, .28, 2.29, 5.64, 1.04, 3.92, 1065;
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 12.25, 4.72, 2.54, 21, 89, 1.38, .47, .53, .8, 3.85, .75, 1.27, 720;
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 12.93, 2.81, 2.7, 21, 96, 1.54, .5, .53, .75, 4.6, .77, 2.31, 600;
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 12.96, 3.45, 2.35, 18.5, 106, 1.39, .7, .4, .94, 5.28, .68, 1.75, 675;
 13.78, 2.76, 2.3, 22, 90, 1.35, .68, .41, 1.03, 9.58, .7, 1.68, 615;
 13.73, 4.36, 2.26, 22.5, 88, 1.28, .47, .52, 1.15, 6.62, .78, 1.75, 520;
 13.45, 3.7, 2.6, 23, 111, 1.7, .92, .43, 1.46, 10.68, .85, 1.56, 695;
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13.4, 4.6, 2.86, 25, 112, 1.98, .96, .27, 1.11, 8.5, .67, 1.92, 630;
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