

一. 抽查某大學之 50 位學生得其每週閱讀所花時間 (小時) 之分配如下, 試求其 (1) 算術平均數 (2) 中位數 (3) 變異數 (variance) (15%)

閱讀時間 (X_i)	人數 (f_i)
5-9	2
10-14	3
15-19	8
20-24	20
25-29	10
30-34	6
35-39	1
合計	50

二. 將某班學生期中考統計成績調整為 $Y_i = 60 + \frac{1}{3}X_i$, 並求得調整後之平均成績 $\bar{y} = 82$ 分; 標準差 $S_y = 7$ 分, 試求原始分數之 \bar{x} 及 S_x . (10%)

三. 長期觀察某地區之天氣, 知雨天後之隔天下雨之機率為 0.8; 晴天後之隔天下雨之機率為 0.6, 今若已知某一天當地下雨, 若接下去為兩個晴天一個雨天之機率? (10%)

四. 某種廠牌之 "6 盎司" 罐裝咖啡重量成為常態分配, 由過去經驗知此種牌子咖啡罐頭重量有 3% 低於 6 盎司, 有 0.16% 超過 6.2 盎司, 試求此種牌子咖啡罐頭重量之平均數或標準差 (15%)

五. (1) 試解釋 O.C 曲線 (operating characteristic curve).

(2) 為檢定燈泡壽命長度 (小時) 之假設為 $H_0: \mu = 1000$ 小時

$H_A: \mu < 1000$ 小時, 抽取 $n = 35$ 件之產品檢定之, 若拒絕區定為

$C = \{\bar{x} < 943.8\}$, 且已知母體之標準差 $\sigma = 200$, 試求 (1) 犯型 I

誤差之機率 α (2) 當 $\mu = 900$ 時犯型 II 誤差之機率 β (15%)

六. 由雙變數常態分配母體抽取 $n = 15$ 對之 (X, Y) 得 $\sum X_i = 272.6$

$\sum Y_i = 1332.6$, $\sum (X_i - \bar{x})^2 = 268.19$, $\sum (Y_i - \bar{y})^2 = 6230.24$,

$\sum (X_i - \bar{x})(Y_i - \bar{y}) = 1040.18$ 試 (1) 配合 Y 對 X 之迴歸直線 (2) 求母體迴歸係數 β_1 之 95% 信賴區間 (20%)

七. 為瞭解家庭中女主人之教育程度與家中擁有之小孩數是否相關, 抽查 200 戶家庭調查得其結果如下表所示, 試以 $\alpha = 5\%$ 檢定之. (15%)

(請翻頁)

< 教育程度 >

小學或以下 中學 大學或以上

小孩數

2人以上	47	10	13
2或以下	43	40	47

TABLE I Normal-Curve Areas

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Also, for $z = 4.0, 5.0,$ and $6.0,$ the areas are $0.49997, 0.4999997,$ and $0.499999999.$

參考值:

$$t_{0.025}(13) = 2.160$$

$$\chi^2_{0.05}(2) = 5.991$$