

```
> #1(a)
> Grade_Point_Average <-
read.csv("data/Grade_Point_Average.csv")
> Grade_Point_Average
```

	GPA	ACT
1	3.897	21
2	3.885	14
3	3.778	28
4	2.540	22
5	3.028	21
6	3.865	31
7	2.962	32
8	3.961	27
9	0.500	29
10	3.178	26
11	3.310	24
12	3.538	30
13	3.083	24
14	3.013	24
15	3.245	33
16	2.963	27
17	3.522	25
18	3.013	31
19	2.947	25
20	2.118	20
21	2.563	24
22	3.357	21
23	3.731	28
24	3.925	27
25	3.556	28



26 3.101 26  
27 2.420 28  
28 2.579 22  
29 3.871 26  
30 3.060 21  
31 3.927 25  
32 2.375 16  
33 2.929 28  
34 3.375 26  
35 2.857 22  
36 3.072 24  
37 3.381 21  
38 3.290 30  
39 3.549 27  
40 3.646 26  
41 2.978 26  
42 2.654 30  
43 2.540 24  
44 2.250 26  
45 2.069 29  
46 2.617 24  
47 2.183 31  
48 2.000 15  
49 2.952 19  
50 3.806 18  
51 2.871 27  
52 3.352 16  
53 3.305 27  
54 2.952 26  
55 3.547 24  
56 3.691 30  
57 3.160 21  
58 2.194 20

59 3.323 30  
60 3.936 29  
61 2.922 25  
62 2.716 23  
63 3.370 25  
64 3.606 23  
65 2.642 30  
66 2.452 21  
67 2.655 24  
68 3.714 32  
69 1.806 18  
70 3.516 23  
71 3.039 20  
72 2.966 23  
73 2.482 18  
74 2.700 18  
75 3.920 29  
76 2.834 20  
77 3.222 23  
78 3.084 26  
79 4.000 28  
80 3.511 34  
81 3.323 20  
82 3.072 20  
83 2.079 26  
84 3.875 32  
85 3.208 25  
86 2.920 27  
87 3.345 27  
88 3.956 29  
89 3.808 19  
90 2.506 21  
91 3.886 24

92 2.183 27  
93 3.429 25  
94 3.024 18  
95 3.750 29  
96 3.833 24  
97 3.113 27  
98 2.875 21  
99 2.747 19  
100 2.311 18  
101 1.841 25  
102 1.583 18  
103 2.879 20  
104 3.591 32  
105 2.914 24  
106 3.716 35  
107 2.800 25  
108 3.621 28  
109 3.792 28  
110 2.867 25  
111 3.419 22  
112 3.600 30  
113 2.394 20  
114 2.286 20  
115 1.486 31  
116 3.885 20  
117 3.800 29  
118 3.914 28  
119 1.860 16  
120 2.948 28

```
> colnames(Grade_Point_Average) <- c("ACT_test_score",  
"Fresh_years")
```

```
> Grade_Point_Average_lsfit <-  
lsfit(Grade_Point_Average$ACT_test_score,
```

Grade\_Point\_Average\$Fresh\_years)

> Grade\_Point\_Average\_lsfit\$coefficients

Intercept X

18.975441 1.870353

> plot(Grade\_Point\_Average)

> abline(Grade\_Point\_Average\_lsfit\$coefficients)

> b0 <- Grade\_Point\_Average\_lsfit\$coefficients[1]

> b0

Intercept

18.97544

> b1 <- Grade\_Point\_Average\_lsfit\$coefficients[2]

> b1

X

1.870353

> X <- 30

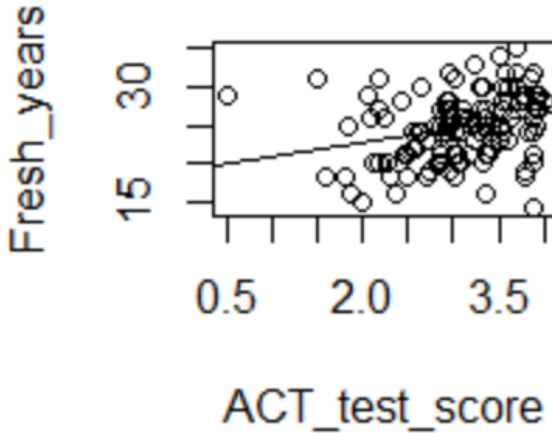
> Y\_hat <- b0 + b1 \* X

> Y\_hat

Intercept

75.08604

X



第二題

```
n <- nrow(Grade_Point_Average)
> n
[1] 120
> Grade_Point_Average_lm <- lm(ACT_test_score ~
Fresh_years, data = Grade_Point_Average)
> Grade_Point_Average_lm
```

Call:

```
lm(formula = ACT_test_score ~ Fresh_years, data =
Grade_Point_Average)
```

Coefficients:

```
(Intercept) Fresh_years
2.11405      0.03883
```

```
> summary(Grade_Point_Average_lm)
```

Call:

```
lm(formula = ACT_test_score ~ Fresh_years, data =  
Grade_Point_Average)
```

Residuals:

Min	1Q	Median	3Q	Max
-2.74004	-0.33827	0.04062	0.44064	1.22737

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	2.11405	0.32089	6.588	1.3e-09 ***
Fresh_years	0.03883	0.01277	3.040	0.00292 **

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6231 on 118 degrees of freedom

Multiple R-squared: 0.07262, Adjusted R-squared:  
0.06476

F-statistic: 9.24 on 1 and 118 DF, p-value: 0.002917

```
> anova(Grade_Point_Average_lm)
```

Analysis of Variance Table

Response: ACT\_test\_score

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Fresh_years	1	3.588	3.5878	9.2402	0.002917 **
Residuals	118	45.818	0.3883		

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

