3.

**> fit<-lm(gamble ~ sex + status + income + verbal,data = teengamb)**

**> summary(fit)**

Call:

lm(formula = gamble ~ sex + status + income + verbal, data = teengamb)

Residuals:

Min 1Q Median 3Q Max

-51.082 -11.320 -1.451 9.452 94.252

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 22.55565 17.19680 1.312 0.1968

sex -22.11833 8.21111 -2.694 0.0101 \*

status 0.05223 0.28111 0.186 0.8535

income 4.96198 1.02539 4.839 1.79e-05 \*\*\*

verbal -2.95949 2.17215 -1.362 0.1803

---

Signif. codes: 0 ¡®\*\*\*¡¯ 0.001 ¡®\*\*¡¯ 0.01 ¡®\*¡¯ 0.05 ¡®.¡¯ 0.1 ¡® ¡¯ 1

Residual standard error: 22.69 on 42 degrees of freedom

Multiple R-squared: 0.5267, Adjusted R-squared: 0.4816

F-statistic: 11.69 on 4 and 42 DF, p-value: 1.815e-06

**> coefficients(fit)**

(Intercept) sex status income verbal

22.55565063 -22.11833009 0.05223384 4.96197922 -2.95949350

**> residuals(fit)**

1 2 3 4 5 6

10.6507430 9.3711318 5.4630298 -17.4957487 29.5194692 -2.9846919

7 8 9 10 11 12

-7.0242994 -12.3060734 6.8496267 -10.3329505 1.5934936 -3.0958161

13 14 15 16 17 18

0.1172839 9.5331344 2.8488167 17.2107726 -25.2627227 -27.7998544

19 20 21 22 23 24

13.1446553 -15.9510624 -16.0041386 -9.5801478 -27.2711657 94.2522174

25 26 27 28 29 30

0.6993361 -9.1670510 -25.8747696 -8.7455549 -6.8803097 -19.8090866

31 32 33 34 35 36

10.8793766 15.0599340 11.7462296 -3.5932770 -14.4016736 45.6051264

37 38 39 40 41 42

20.5472529 11.2429290 -51.0824078 8.8669438 -1.4513921 -3.8361619

43 44 45 46 47

-4.3831786 -14.8940753 5.4506347 1.4092321 7.1662399

**> max(residuals(fit))**

[1] 94.25222

**> predict(fit)**

1 2 3 4 5 6

-10.6507430 -9.3711318 -5.4630298 24.7957487 -9.9194692 3.0846919

7 8 9 10 11 12

8.4742994 18.9060734 -5.1496267 10.4329505 -1.4934936 8.4958161

13 14 15 16 17 18

1.0827161 -5.9331344 -0.4488167 -13.8107726 25.3627227 36.1998544

19 20 21 22 23 24

-1.1446553 15.9510624 17.0041386 10.7801478 27.3711657 61.7477826

25 26 27 28 29 30

37.8006639 11.2670510 40.3747696 11.7455549 7.4803097 29.4090866

31 32 33 34 35 36

77.1206234 38.1400660 78.2537704 6.5932770 28.5016736 24.3948736

37 38 39 40 41 42

17.9527471 45.9570710 57.0824078 16.1330562 8.3513921 73.5361619

43 44 45 46 47

17.6831786 15.4940753 32.5493653 12.9907679 12.0337601

**> confint(fit)**

2.5 % 97.5 %

(Intercept) -12.1489038 57.2602050

sex -38.6890301 -5.5476301

status -0.5150722 0.6195399

income 2.8926538 7.0313047

verbal -7.3430703 1.4240833

**> apply(teengamb[1:5], 2, mean)**

sex status income verbal gamble

0.4042553 45.2340426 4.6419149 6.6595745 19.3010638

**> x <- data.frame(sex=0.4042553,status=45.234043, income=4.641915, verbal=6.659574, gamble=19.301064)**

**> predict(fit, x, interval="prediction")**

fit lwr upr

1 19.30107 -26.97447 65.5766

**> fit2<-lm(gamble ~ income,data = teengamb)**

**> anova(fit2,fit)**

Analysis of Variance Table

Model 1: gamble ~ income

Model 2: gamble ~ sex + status + income + verbal

Res.Df RSS Df Sum of Sq F Pr(>F)

1 45 28009

2 42 21624 3 6384.8 4.1338 0.01177 \*

---

Signif. codes: 0 ¡®\*\*\*¡¯ 0.001 ¡®\*\*¡¯ 0.01 ¡®\*¡¯ 0.05 ¡®.¡¯ 0.1 ¡® ¡¯ 1

4.

**> model<-lm(hipcenter ~ Age + Weight + Ht,data=seatpos)**

**> summary(model)**

Call:

lm(formula = hipcenter ~ Age + Weight + Ht, data = seatpos)

Residuals:

Min 1Q Median 3Q Max

-91.526 -23.005 2.164 24.950 53.982

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 528.297729 135.312947 3.904 0.000426 \*\*\*

Age 0.519504 0.408039 1.273 0.211593

Weight 0.004271 0.311720 0.014 0.989149

Ht -4.211905 0.999056 -4.216 0.000174 \*\*\*

---

Signif. codes: 0 ¡®\*\*\*¡¯ 0.001 ¡®\*\*¡¯ 0.01 ¡®\*¡¯ 0.05 ¡®.¡¯ 0.1 ¡® ¡¯ 1

Residual standard error: 36.49 on 34 degrees of freedom

Multiple R-squared: 0.6562, Adjusted R-squared: 0.6258

F-statistic: 21.63 on 3 and 34 DF, p-value: 5.125e-08

**> reduced\_1<-lm(hipcenter ~ Weight + Ht,data=seatpos)**

**> anova(reduced\_1,model)**

Analysis of Variance Table

Model 1: hipcenter ~ Weight + Ht

Model 2: hipcenter ~ Age + Weight + Ht

Res.Df RSS Df Sum of Sq F Pr(>F)

1 35 47420

2 34 45262 1 2157.9 1.621 0.2116

**> model2<-lm(hipcenter ~ Age + Weight + Ht + HtShoes,data=seatpos)**

**> summary(model2)**

Call:

lm(formula = hipcenter ~ Age + Weight + Ht + HtShoes, data = seatpos)

Residuals:

Min 1Q Median 3Q Max

-91.420 -23.462 2.353 24.838 54.140

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 530.36851 139.05493 3.814 0.000568 \*\*\*

Age 0.52641 0.42048 1.252 0.219394

Weight 0.00382 0.31640 0.012 0.990440

Ht -3.34879 9.15931 -0.366 0.716985

HtShoes -0.86460 9.11868 -0.095 0.925034

---

Signif. codes: 0 ¡®\*\*\*¡¯ 0.001 ¡®\*\*¡¯ 0.01 ¡®\*¡¯ 0.05 ¡®.¡¯ 0.1 ¡® ¡¯ 1

Residual standard error: 37.03 on 33 degrees of freedom

Multiple R-squared: 0.6563, Adjusted R-squared: 0.6146

F-statistic: 15.75 on 4 and 33 DF, p-value: 2.635e-07

**> anova(model,model2)**

Analysis of Variance Table

Model 1: hipcenter ~ Age + Weight + Ht

Model 2: hipcenter ~ Age + Weight + Ht + HtShoes

Res.Df RSS Df Sum of Sq F Pr(>F)

1 34 45262

2 33 45250 1 12.327 0.009 0.925