

Self-service Traveling in City

With the fr good self-service traveling includes transport choices, hotel arrangements, and travel route design. Taking city C as an example, you should make a traveling plan for tourists.

There are 14 popular attractions in City C, the 14 attractions were recorded as V001-V014, the bus station of each attraction corresponds to S ***** (all are odd number sites). All the bus station, physical exertion, opening time, visiting time and ticket fees are shown in Table 1:

Table 1 14 attractions and the corresponding bus station

attractions	bus station			physical exertion (%)	opening time	visiting time (hour)	ticket fees (yuan)
V001	S0045			15	8:30-16:30	2	120
V002	S1171	S0995		30	9:00-17:00	2	90
V003	S0025			25	9:00-17:00	3	140
V004	S1353	S1119	S1281	50	9:00-17:00	3	50
V005	S0897	S0861		25	9:00-17:00	3	180
V006	S0771	S0471		20	9:00-17:00	1	50
V007	S0881	S0917	S1059	40	9:00-17:00	2	145
V008	S0761			40	9:00-17:00	2	50
V009	S0757	S1187		60	8:30-16:30	4	100
V010	S0009			30	8:30-16:30	2	80
V011	S0987			20	9:00-17:00	3	150
V012	S0237			45	9:00-17:00	3	55
V013	S0115			20	8:30-16:30	2	55
V014	S1049			35	8:30-16:30	3	120

Bus lines, the first and the last bus time, the interval time between two buses and the prices of bus in City C are indicated in Annex 1. After the selecting, the appropriate hotels and their corresponding bus station, the prices of hotel room are shown in Table 2.

Table 2. 28 hotels and the corresponding bus station, price of hotel room

Hotel	Bus station	Room Price (Yuan/Per night)		Hotel	Bus station	Room Price (Yuan/Per night)
H001	S1123	220		H002	S1121	220
H003	S0219	220		H004	S1099	260
H005	S0875	250		H006	S0961	240
H007	S1239	250		H008	S0475	220
H009	S0869	250		H010	S1157	210
H011	S1181	220		H012	S1153	200
H013	S0483	200		H014	S0813	210
H015	S1155	220		H016	S0967	200
H017	S0971	180		H018	S0879	190
H019	S1137	220		H020	S1173	190
H021	S0919	200		H022	S0973	200
H023	S1153	180		H024	S1357	200
H025	S1229	180		H026	S0913	200
H027	S0965	180		H028	S1131	220

Your tasks are:

(1) If a tourist visits all the attractions, he needs at least a few days, it cost the least. How to arrange accommodation? If the tourist does not change hotels, do you change the program or not? if there is a faster way to travel (the time is half less than the bus, the cost of each station is 3 yuan), do you change the program or not?

(2) Assuming a tourist classifies the attractions of the city C into three grades according to his interest, I is the most interested attractions to the tourist, including V002, V004, V007, V009; II is the more interested attractions, including V001, V005, V006, V014; the remaining attractions are III. The tourists hope to spend 3 days to visit City C. According to the above, please make a best travel program.

(3) Affected by the number of tourists of each attraction, the tourist will adjust his time according to each attraction. The visit time of each attraction is t in Table 1, the actual visit time will fluctuate between $t \sim 1.5t$, please discuss program (2) and optimize your travel plan accordingly.

(4) Write a policy recommendation letter addressed to the director of the local travel agency.

Notice:

- Your submission should consist of a 1 page Summary Sheet, a 1-2 page policy recommendation, and your solution (not to exceed 20 pages) for a maximum of 23 pages. Note: The appendix and references do not count toward the 23 page limit.
- Be sure to submit your paper before 9:00 AM on January 30th. Mail address: tjpushumo@163.com. Name your paper with temporary number (201801.pdf for example)

Annex 1 Bus lines and the first-last bus time, intervals departure time of two adjacent buses, one-way charge in City C

L001 (S0977—S0219) 7:00—20:00 10 minutes 2 Yuan
S0977-S0975-S0973-S0971-S0969-S0967-S0879-S0877-S0875-S0873-S0871-S0869-S0763-S0761-S0759-S0757-S0521-S0517-S0515-S0513-S0511-S0509-S0507-S0505-S0503-S0233-S0243-S0211-S0213-S0215-S0217-S0223-S0219

L002 (S1013—S1133) 8:00—19:00 10 minutes 1 Yuan
S1133-S1131-S1129-S1127-S1183-S1185-S1187-S1189-S1191-S1193-S1195-S1113-S0879-S0967-S0991-S0993-S0995-S0997-S0999-S1001-S1003-S1005-S1007-S1009-S1011-S1013

L003 (S0965—S0219) 9:00—18:00 12 minutes 2 Yuan
S0965-S0961-S0959-S0957-S0947-S0881-S0849-S0813-S0811-S0809-S0805-S0801-S0785-S0715-S0713-S0761-S0759-S0521-S0511-S0509-S0507-S0503-S0231-S0239-S0241-S0237-S0235-S0215-S0217-S0223-S0219

L004 (S0965—S1133) 8:10—18:10 8 minutes 1 Yuan
S0965-S0963-S0979-S0977-S0975-S0973-S0981-S0969-S0967-S0879-S1113-S1115-S1117-S1119-S1121-S1123-S1125-S1127-S1129-S1131-S1133

L005 (S1277—S0745) 8:20—18:00 10 minutes 1 Yuan
S0745-S0747-S0793-S0803-S0805-S0809-S0811-S0825-S0827-S0829-S0953-S0881-S0947-S0955-S0957-S1021-S1015-S1023-S1025-S1173-S1171-S1169-S1259-S1261-S1263-S1265-S1267-S1269-S1271-S1273-S1275-S1277

L006 (S0461—S0701) 7:50—18:30 10 minutes 1 Yuan
S0461-S0463-S0987-S0963-S0961-S0977-S0975-S0973-S0981-S0969-S0967-S0879-S0899-S0877-S0875-S0851-S0849-S0847-S0845-S0827-S0825-S0811-S0897-S0895-S0893-S0747-S0749-S0723-S0725-S0727-S0719-S0705-S0701。

L007 (S0219—S1133) 7:30-19:30 10 minutes 2 Yuan

S0219-S0223-S0207-S0205-S0203-S0201-S0239-S0331-S0503-S0523-S0525-S0527-S0529-S0531-S0533-S0535-S0537-S0539-S0541-S1313-S1315-S1317-S1319-S1321-S1323-S1325-S1327-S1329-S1331-S1333-S1335-S1337-S1127-S1129-S1131-S1133

L008 (S0201—S0261) 7:40—19:30 10 minutes 1 Yuan
S0201-S0203-S0205-S0207-S0223-S0217-S0215-S0209-S0247-S0249-S0251-S0253-S0255-S0257-S0259-S0263-S0265-S0261。

L009 (S0219—S0601) 7:00-19:00 10 minutes 1 Yuan
S0219-S0223-S0207-S0205-S0203-S0201-S0239-S0231-S0503-S0523-S0525-S0527-S0549-S0553-S0597-S0599-S0601

L010 (S1133—S0701) 7:00—19:00 8 minutes 1 Yuan
S1133-S1131-S1129-S1127-S1125-S1123-S1121-S1119-S1117-S1135-S1137-S0855-S0853-S0851-S0849-S0847-S0845-S0843-S0841-S0839-S0837-S0805-S0803-S0801-S0715-S0721-S0723-S0725-S0727-S0719-S0705-S0701

L011 (S0977—S0219) 8:05—17:55 10 minutes 2 Yuan
S0977-S0975-S0973-S0971-S0969-S0967-S0879-S0877-S0875-S0873-S0871-S0869-S0763-S0761-S0759-S0755-S0521-S0517-S0515-S0513-S0511-S0509-S0507-S0505-S0503-S0233-S0243-S0211-S0213-S0215-S0217-S0223-S0219

L012 (S0983—S0063) 8:00—17:30 15 minutes 3 Yuan
S0983-S0961-S0963-S0987-S0051-S0053-S0055-S0057-S0059-S0061-S0063。

L013 (S1103—S0569) 7:40—17:40 8 minutes 1 Yuan
S1103-S1107-S1033-S1031-S1029-S1099-S0981-S0969-S1025-S1023-S1027-S1015-S1021-S0957-S0955-S0947-S0881-S0953-S0943-S0845-S0843-S0825-S0811-S0809-S0805-S0803-S0801-S0715-S0713-S0711-S0743-S0741-S0739-S0737-S0735-S0707-S0705-S0733-S0731-S0729-S0577-S0575-S0573-S0571-S0569

L014 (S1205—S0685) 8:20—18:00 10 minutes 1 Yuan
S1205-S1199-S1197-S1215-S1217-S1219-S1221-S1223-S1117-S1115-S1167-S1169-S1171-S1173-S1025-S0969-S0981-S0973-S0975-S0977-S0961-S1035-S1037-S1041-S1039-S1043-S1049-S1047-S1045-S0687-S0689-S0685

L015 (S1133—S0701) 8:05-17:45 10 minutes 1 Yuan
S1133-S1153-S1155-S1157-S0819-S0817-S0815-S0813-S0811-S0809-S0805-S0803-S0801-S0715-S0713-S0711-S0709-S0707-S0705-S0701。

L016 (S0501—S0097) 8:00—18:00 8 minutes 2 Yuan
S0501-S0231-S0239-S0241-S0237-S0235-S0227-S0217-S0283-S0281-S0273-S0275-S0277-S0279-S0079-S0081-S0083-S0085-S0087-S0089-S0091-S0093-S0095-S0097。

L017 (S0621—S0309) 7:50—18:30 10 minutes 1 Yuan
S0621-S0619-S0617-S0505-S0503-S0245-S0233-S0243-S0285-S0211-S0291-S0287-S0289-S0293-S0295-S0297-S0299-S0301-S0303-S0305-S0307-S0309

L018 (S0329—S0103) 8:00—18:15 15 minutes 1 Yuan
S0329-S0327-S0325-S0323-S0231-S0229-S0211-S0213-S0227-S0209-S0247-S0249-S0269-S0271-S0273-S0275-S0277-S0279-S0079-S0081-S0083-S0099-S0001-S0003-S0005-S0007-S0009-S0101-S0103

L019 (S0965—S1133) 7:40—18:30 10 minutes 1 Yuan

S0965-S1003-S1001-S1073-S1111-S1033-S1109-S1101-S1095-S1093-S1091-S1089-S1141-S1143-S1145-S1147-S1149-S1127-S1129-S1131-S1133

L020 (S1307—S0055) 7:45-17:45 12 minutes 1 Yuan
S1307-S1269-S1305-S1293-S1291-S1309-S1311-S1169-S1171-S1173-S1025-S0969-S0981-S1099-S1075-S1073-S1079-S0459-S0457-S0455-S0453-S0451-S0051-S0065-S0067-S0069-S0071-S0 075-S0073-S0077-S0055

L021 (S0219—S0025) 8:10-16:10 15 minutes 3 Yuan
S0219-S0217-S0215-S0213-S0211-S0011-S0013-S0015-S0017-S0019-S0021-S0023-S0025。

L022 (S0965—S0177) 8:00—18:00 8 minutes 1 Yuan
S0965-S0963-S1015-S1017-S0999-S1019-S0989-S0981-S0985-S1025-S1177-S1287-S1171-S1169-S1259-S1261-S1289-S1291-S1293-S1295-S1297-S1149-S1299-S1301-S1303-S1133-S1285-S0 161-S0163-S0165-S0167-S0169-S0171-S0173-S0175-S0177。

L023 (S0965--S0219) 8:06-17:54 12 minutes 2 Yuan
S0965-S0963-S0961-S0959-S0957-S0955-S0947-S0881-S0849-S0847-S0813-S0811-S0809-S0805-S0801-S0785-S0783-S0715-S0713-S0761-S0759-S0755-S0521-S0517-S0515-S0513-S0511-S0509-S0507-S0505-S0503-S0231-S0239-S0241-S0237-S0235-S0215-S0217-S0223-S0219

L024 (S1103—S0309) 8:30—18:30 8 minutes 2 Yuan
S1103-S1101-S1095-S1175-S1169-S1167-S1115-S1139-S1135-S1227-S1245-S1243-S1247-S1239-S1249-S1251-S1253-S0713-S0761-S0759-S07L055-S0765-S0521-S0517-S0515-S0513-S0511-S0543-S0545-S0547-S0549-S0527-S0525-S0523-S0503-S0233-S0243-S0211-S0311-S0313-S0315-S0307-S0309

L025 (S1103—S0503) 8:10—17:25 15 minutes 1 Yuan
S1103-S1107-S1033-S1031-S1029-S1257-S0995-S1173-S1255-S1231-S1229-S1227-S1245-S1155-S1179-S1163-S1161-S1153-S1197-S1199-S1201-S1203-S1349-S1347-S1345-S1343-S1341-S1339-S1315-S1313-S0541-S0539-S0537-S0535-S0533-S0543-S0545-S0547-S0509-S0507-S0505-S0503

L026 (S0983—S0043) 8:10—17:30 20 minutes 3 Yuan
S0983-S0975-S0989-S1101-S1103-S0027-S0029-S0031-S0033-S0035-S0037-S0039-S0041-S0043

L027 (S0219—S0191) 7:30—18:00 10 minutes 2 Yuan
S0191-S0193-S0195-S0197-S0199-S0171-S0169-S0167-S0421-S0423-S0425-S0427-S0429-S0431-S0433-S0435-S0437-S0145-S0147-S0187-S0189-S0143-S0141-S0179-S0181-S0183-S0185-S0551-S0533-S0543-S0545-S0553-S0509-S0507-S0505-S0503-S0231-S0229-S0211-S0213-S0227 -S0217-S0223-S0219

L028 (S1205—S0685) 7:35—18:35 10 minutes 1 Yuan
S1205-S1203-S1201-S1199-S1197-S1153-S1161-S1163-S1165-S0823-S0821-S0807-S0805-S0809-S0811-S0825-S0827-S0829-S0831-S0833-S0835-S0647-S0697-S0649-S0685

L029 (S1205—S0911) 7:43--17:23 10 minutes 1 Yuan
S1205-S1199-S1241-S1237-S1235-S1239-S1159-S1155-S1225-S1227-S1229-S1231-S1233-S0879-S0913-S0915-S0917-S0919-S0921-S0923-S0925-S0901-S0903-S0905-S0907-S0909-S0911

L030(S0201—S0011)8:00—17:45 15 minutes 1 Yuan S0201-S0203-S0205-S0267-S0235-S0317-S0289-S0293-S0319-S0321-S0313-S0291-S0333-S03 35-S0337-S0339-S0341-S0343-S0345-S0011

L031(S0153-S1103) 8:00—18:00 10 minutes 2 Yuan
S0153-S0151-S0149-S0147-S0145-S0143-S0141-S0587-S0589-S1315-S1339-S1341-S1343-S11
87-S1351-S1203-S1205-S1369-S1367-S1363-S1365-S1361-S1359-S1151-S1353-S1117-S1355-
S 1357-S0879-S0967-S0969-S0981-S0989-S1075-S1073-S1077-S1103。

L032(S0643—S0153)8:30—17:30 15 minutes 1 Yuan S0643-S0641-S0639-S0637-S0635-
S0633-S0631-S0629-S0627-S0625-S0623-S0581-S0579-S05 75-S0573-S0519-S0571-S0569-
S0593-S0591-S0589-S0587-S0141-S0143-S0145-S0147-S0149-S 0151-S0153

L033(S0219-S0219)7:30-17:40 10 minutes 1 Yuan
S0219-S0389-S0225-S0355-S0357-S0359-S0361-S0301-S0387-S0303-S0385-S0383-S0381-S03
15-S0321-S0379-S0377-S0375-S0213-S0267-S0373-S0217 S0371 S0219

L034(S0119—S0819)7:40-17:40 15 minutes 2 Yuan
S0119-S0121-S0123-S0125-S0347-S0225-S0355-S0357-S0359-S0361-S0297-S0293-S0319-S03
21-S0315-S0363-S0365-S0335-S0367-S0337-S0339-S0369-S0353-S0565-S0555-S0557-S0559-S
0567-S0561-S0563-S0671-S0581-S0673-S0675-S0677-S0653-S0679-S0681-S0669-S0661-S068
3-S0655-S0755-S0745-S0747-S0793-S0803-S0805 S0795-S0863-S0813-S0815-S0817-S0819

L035(S0983—S0049)8:10-17:10 30 minutes 3 Yuan
S0983-S0975-S0989-S1101-S1103-S0027-S0029-S0031-S0033-S0035-S0039-S0045-S0047-
S0049

L036(S1205—S0691)7:50—18:00 10 minutes 1 Yuan S0691-S0693-S0695-S0697-S0699-
S0647-S0857-S0859-S0861-S0825-S0811-S0809-S0805-S08 03-S0801-S0787-S0789-S0791-
S1213-S1181-S1211-S1209-S1207-S1201-S1203-S1205

L037(S1103—S0585)7:40—18:30 10 minutes 1 元 S1103-S1101-S1109-S1019-S0989-S0981-
S0969-S1025-S1023-S1027-S1057-S1051-S1061-S106 3-S1065-S0817-S0815-S0813-S0841-
S0839-S0933-S0805-S0803-S0793-S0747-S0749-S0723-S0 725-S0727-S0719-S0705-S0733-
S0731-S0729-S0577-S0579-S0581-S0583-S0585。

L038(S1277—S0659)7:20—18:32 8 minutes 1 Yuan S1277-S1275-S1141-S1089-S1091-
S1267-S1265-S1263-S1279-S1195-S1281-S1117-S1223-S122 1-S1245-S1283-S0875-S0819-
S0817-S0941-S0939-S0937-S0935-S0933-S0805-S0929-S0927-S0 751-S0745-S0753-S0655-
S0657-S0659

L039(S0767—S1133)7:30—18:40 10 minutes 1 Yuan S0767-S0769-S0771-S0471-S0473-
S0735-S0737-S0739-S0781-S0475-S0477-S0791-S1213-S11 81-S1163-S1161-S1153-S1197-
S1199-S1371-S1369-S1367-S1363-S1373-S1375-S1377-S1379-S 1335-S1381-S1127-S1129-
S1131-S1133

L040(S1277—S0769)7:30—19:42 12 minutes 1 Yuan

S0767-S0769-S0771-S0773-S0775-S0711-S0777-S0779-S0781-S0761-S1383-S1385-S1387-S1389-S1391-S1393-S1349-S1203-S1205-S1369-S1395-S1397-S1399-S0439-S1379-S0441-S0443-S 0445-S0447-S0449-S0495-S0497-S1277

L041 (S0391—S0521) 8:00-18:00 20 minutes 1 Yuan

S0391-S0393-S0395-S0397-S0399-S0401-S0403-S0405-S0407-S0409-S0411-S0415-S0413-S0417-S0419-S0145-S0141-S0587-S0589-S0591-S0593-S0569-S0571-S0519-S0521