input analysis

distribution

```
arrival distribution(exponential distribution, can see mean below)
timespent distribution(exponential distribution , can see mean and standard
variance below)
speed(beta distribution , use: 2.32 + 6.53 * BETA(3.68, 3.78))
```

arrival distribution (attraction A)

```
data number = 175
mean = 8.60377142857
k = 14
chi-square value = 10.2
----------interval_count----------------
[9, 15, 17, 16, 11, 7, 10, 11, 13, 15, 10, 17, 13, 11]

----------interval_endpoint-------------
[-0.0, 0.63760805344555893, 1.3262772147926263, 2.0749032140966612,
2.8949302159491164, 3.8014280102654747, 4.8148063272162771,
5.9636799078964975, 7.289957122689124, 8.8586101238456134,
10.778486235112771, 13.253637030585622, 16.742166143009271,
22.705846050905762, inf]
----------------------------------------
```

Absolutely , freedom = k -s -1= 12 . If we select level of significance as 0.05 , the corresponding value is 21.026 which is greater than 10.2. Therefore we accept the null hypothesis which means our input data is exponatial distribution

arrival distribution (attraction B)

```
data number = 180
mean = 8.41683333333
k = 14
chi-square value = 15.0666666667
----------interval_count----------------
[18, 14, 9, 11, 10, 16, 9, 16, 15, 13, 4, 13, 17, 15]

----------interval_endpoint-------------
[-0.0, 0.62375445028918453, 1.2974605803260615, 2.0298208385516112,
2.8320307369346458, 3.7188326371406268, 4.7101928177544652,
5.8341042942429668, 7.1315648745690288, 8.6661350311776122,
10.544297111997428, 12.965669168811996, 16.378401406240396,
22.212505700483355, inf]
----------------------------------------
```

arrival distribution (attraction C)

```
data number = 169
mean = 8.95142011834
k = 14
chi-square value = 17.9704142012
----------interval_count----------------
[11, 13, 13, 11, 8, 17, 11, 3, 19, 18, 12, 11, 10, 12]

----------interval_endpoint-------------
[-0.0, 0.66337159286644298, 1.3798674966619999, 2.1587428871717171,
3.0119043481550571, 3.9550305876935368, 5.0093560226676228,
6.2046516170371584, 7.5845191136991588, 9.2165559651922155,
11.214007639704777, 13.789170730736316, 17.418659256741936,
23.623310873779086, inf]
----------------------------------------
```

arrival distribution (attraction D)

```
data number = 192
mean = 7.93760416667
k = 14
chi-square value = 5.16666666667
----------interval_count----------------
[13, 18, 12, 9, 17, 14, 12, 13, 14, 13, 13, 17, 14, 13]

----------interval_endpoint-------------
[-0.0, 0.58823974855059968, 1.2235870784913441, 1.9142489470316342,
2.670783427372192, 3.5070934954599022, 4.4420086100486609,
5.5019279485258741, 6.7255150270172184, 8.1727113758980643,
9.9439365585745314, 12.227442975543092, 15.445864507100406,
20.947792455626274, inf]
----------------------------------------
```

time spent distribution (attraction A)

```
data number = 600
mean = 29.9076666667
variance = 5.11291905101
k = 25
chi-square value = 26.75
----------interval_count----------------
[25, 23, 25, 30, 22, 21, 33, 17, 20, 17, 23, 26, 21, 30, 26, 32, 15, 26, 24,
32, 22, 26, 22, 14, 28]

----------interval_endpoint-------------
[-inf, 20.956550500616533, 22.723649517921533, 23.900054312822089,
24.82308401017243, 25.604525427793781, 26.296398837341545,
26.927645220417929, 27.51636056653771, 28.074895873649137,
28.612323436524417, 29.13577328863655, 29.651235454293204,
30.164097879040124, 30.679560044696778, 31.203009896808911,
31.740437459684191, 32.298972766795622, 32.887688112915399,
33.518934495991786, 34.210807905539546, 34.992249323160898,
35.915279020511242, 37.091683815411798, 38.858782832716791, inf]
----------------------------------------
```

freedom = 23 , corresponding value= 35.172

time spent distribution (attraction B)

```
data number = 600
mean = 29.982
variance = 5.28894847772
k = 25
chi-square value = 23.25
----------interval_count----------
[22, 25, 27, 27, 21, 22, 16, 35, 28, 22, 20, 20, 24, 18, 15, 33, 28, 29, 26,
22, 27, 20, 27, 24, 22]

----------interval_endpoint----------
[-inf, 20.722711568481365, 22.550648910009606, 23.767555394758354,
24.72236349243893, 25.530708657875849, 26.246402135455625,
26.899381297364584, 27.508365148390816, 28.086129911107957,
28.642060224534578, 29.183531597515401, 29.716740281081879,
30.247259718918112, 30.78046840248459, 31.321939775465413,
31.877870088892035, 32.455634851609176, 33.064618702635407,
33.717597864544366, 34.433291342124143, 35.241636507561061,
36.196444605241638, 37.413351089990385, 39.241288431518619, inf]
----------------------------------------
```

time spent distribution (attraction C)

```
data number = 600
mean = 30.03
variance = 4.96338594107
k = 25
chi-square value = 12.4166666667
----------interval_count----------
[30, 17, 23, 31, 19, 29, 19, 22, 24, 23, 25, 19, 23, 24, 22, 28, 22, 24, 25,
24, 28, 26, 27, 23, 23]

----------interval_endpoint----------
[-inf, 21.340669366721905, 23.056087571363488, 24.19808707531757,
25.094121723491615, 25.852709001579168, 26.524347789458606,
27.137132656938665, 27.708630355820262, 28.250830665124518,
28.77254055008525, 29.280681518269102, 29.781068408936918,
30.278931591063085, 30.7793184817309, 31.287459449914753, 31.809169334875484,
32.351369644179741, 32.922867343061341, 33.535652210541393,
34.207290998420831, 34.965878276508384, 35.861912924682429,
37.003912428636518, 38.719330633278091, inf]
----------------------------------------
```

time spent distribution (attraction D)

```
data number = 600
mean = 30.0328333333
variance = 5.01161703501
k = 25
chi-square value = 22.3333333333
----------interval_count----------------
[21, 22, 19, 22, 33, 24, 31, 28, 32, 21, 18, 17, 23, 24, 31, 26, 25, 20, 22,
22, 28, 17, 21, 30, 23]

----------interval_endpoint-------------
[-inf, 21.259065195699414, 22.991152766284074, 24.144249510308661,
25.048991265244002, 25.814950022137126, 26.493115377536036,
27.111854906784728, 27.688906064439532, 28.236375138728203,
28.76315467548871, 29.276233441188296, 29.781482780074917,
30.284183886591755, 30.789433225478376, 31.302511991177962,
31.829291527938469, 32.376760602227137, 32.953811759881944,
33.572551289130637, 34.250716644529547, 35.016675401422674,
35.921417156358011, 37.074513900382605, 38.806601470967252, inf]
----------------------------------------
```

speed distribution(beta distribution)

```
data number = 5000
mean = 5.54145722666
variance = 1.12258967986
k = 83
chi-square value = 93.5772
----------interval_count----------------
[54, 72, 70, 67, 62, 64, 69, 58, 54, 54, 65, 54, 55, 49, 66, 49, 51, 57, 56,
47, 56, 62, 55, 54, 59, 69, 56, 57, 59, 46, 67, 70, 69, 56, 76, 63, 63, 75,
50, 46, 57, 65, 74, 55, 67, 75, 73, 66, 69, 62, 73, 70, 61, 57, 68, 52, 62,
49, 54, 52, 59, 75, 58, 50, 49, 63, 61, 46, 52, 52, 60, 43, 66, 68, 51, 52,
63, 67, 60, 68, 73, 63, 59]

----------interval_endpoint-------------
[2.3199999999999998, 3.210566823790324, 3.4181487958918613,
3.5649545385459902, 3.6831300856145273, 3.7841228699329408,
3.8734868402115699, 3.9543857130277211, 4.0288123792175323,
4.0981126561963883, 4.1632431530343066, 4.2249111577163765,
4.2836562616383871, 4.3399007804609564, 4.3939823618509042,
4.4461758851241928, 4.49670864277088, 4.5457711526989772, 4.5935250401431604,
4.6401089014074666, 4.6856427450751799, 4.7302314098603659,
4.7739672328292082, 4.816932159576746, 4.8591994329375678,
4.9008349592245555, 4.9418984248393727, 4.9824442176019392,
5.0225221938665356, 5.0621783228275037, 5.1014552322959332,
5.1403926749217606, 5.1790279298404442, 5.2173961516881802,
5.2555306766053151, 5.2934632930560621, 5.3312244839043421,
5.3688436451067982, 5.4063492855451338, 5.4437692118702028,
5.4811307017314803, 5.5184606683903574, 5.5557858194434555,
5.5931328121990598, 5.6305284081459828, 5.6679996289249317,
5.7055739162558501, 5.7432792983929417, 5.7811445658782636, 5.81919945965452,
5.8574748749935548, 5.8960030852197276, 5.9348179898864579,
5.9739553929385343, 6.0134533175162641, 6.0533523655015333,
6.0936961317689899, 6.1345316855218019, 6.1759101342464824,
6.2178872899745192, 6.2605244630557815, 6.3038894160535541,
6.3480575204222109, 6.3931131724422823, 6.4391515441329403,
6.4862807720785511, 6.5346247262342683, 6.5843265580605035,
6.635553312908792, 6.6885020223132106, 6.7434078966559881,
6.8005555688095267, 6.86029488900488, 6.9230637210227943, 6.9894219038964156,
7.0601037986504664, 7.1361034123184091, 7.2188203946236627,
7.3103294018669622, 7.4139277705450368, 7.5354122264269563,
7.6867527739963801, 7.9016569536462438, 8.8499999999999996]
----------------------------------------
```

when freedom = 80 , the corresponding value is 101.880

try on exponetial distribution (not satisfied)

```
data number = 5000
mean = 5.54145722666
variance = 1.12258967986
k = 83
chi-square value = 236.2708
----------interval_count----------------
[12, 79, 80, 89, 82, 65, 91, 58, 53, 81, 58, 63, 56, 67, 48, 60, 56, 49, 53,
60, 60, 53, 52, 63, 58, 55, 56, 52, 43, 65, 66, 62, 57, 65, 61, 52, 64, 65,
44, 39, 50, 65, 70, 51, 61, 63, 70, 52, 67, 60, 64, 67, 63, 57, 53, 56, 61,
51, 52, 50, 47, 60, 72, 50, 55, 53, 60, 64, 54, 54, 54, 64, 46, 72, 73, 61,
72, 73, 67, 89, 85, 85, 15]

----------interval_endpoint-------------
[-inf, 3.0093563432522377, 3.3235964791052606, 3.5238349341317563,
3.675000455012567, 3.7983516655220648, 3.9036527429438901,
3.9962408753902849, 4.0793681766317968, 4.1551704662001887,
4.2251298498337739, 4.2903192373674006, 4.3515418433679631,
4.4094156611011925, 4.4644271269091069, 4.5169665836666635,
4.567352504357193, 4.6158485105770168, 4.662675622868993, 4.7080212675060729,
4.7520460231971606, 4.7948887593319398, 4.8366706078442867,
4.8774980750065282, 4.9174655094471778, 4.9566570817514046,
4.995148388981991, 5.0330077679856107, 5.0702973803578217,
5.1070741167786826, 5.1433903573396753, 5.1792946162740829,
5.2148320933635137, 5.2500451496578187, 5.2849737216164669,
5.319655685073525, 5.3541271783421562, 5.3884228921602197,
5.4225763329280845, 5.4566200647238068, 5.4905859348408237,
5.5245052870364253, 5.5584091662743509, 5.5923285184699525,
5.6262943885869703, 5.6603381203826926, 5.6944915611505564,
5.7287872749686199, 5.763258768237252, 5.7979407316943092,
5.8328693036529575, 5.8680823599472625, 5.9036198370366932,
5.9395240959711009, 5.9758403365320936, 6.0126170729529544,
6.0499066853251655, 6.0877660643287852, 6.1262573715593716,
6.1654489438635993, 6.205416378304248, 6.2462438454664895,
6.2880256939788364, 6.3308684301136156, 6.3748931858047042,
6.4202388304417841, 6.4670659427337593, 6.5155619489535832,
6.5659478696441136, 6.6184873264016693, 6.6734987922095845,
6.7313726099428131, 6.7925952159433756, 6.8577846034770031,
6.9277439871105884, 7.0035462766789793, 7.0866735779204912,
7.1792617103668865, 7.2845627877887118, 7.4079139982982092,
7.5590795191790203, 7.7593179742055165, 8.0735581100585403, inf]
----------------------------------------
```

ks test

speed distribution

```
N = 5000
D = 0.0131667555515

table value = 1.22 / sqrt(N) = 0.017253405461


###################try norm distribute (not satisfied)
N = 5000
D = 0.0189412032971
table value =  1.22 / sqrt(N) = 0.017253405461
```

arrival distribution

```
N = 175
D = 0.0432427897427
table value = 1.22 / sqrt(N) = 0.0922233314143

N = 180
D = 0.048656029961
table value =  1.22 / sqrt(N) = 0.090933431085

N = 169
D = 0.0592837421439
table value =  1.22 / sqrt(N) = 0.0938461538462

N = 192
D = 0.030980527694
table value =  1.22 / sqrt(N) = 0.0880459160514
```

timespent distribution

```
N = 600
D = 0.025022344605
table value =  1.22 / sqrt(N) = 0.0498062914366

N = 600
D = 0.0356912220615
table value =  1.22 / sqrt(N) = 0.0498062914366

N = 600
D = 0.0240174051774
table value =  1.22 / sqrt(N) = 0.0498062914366

N = 600
D = 0.0341573076512
table value =  1.22 / sqrt(N) = 0.0498062914366
```