

```
load("Popularity.mat")
```

```
%% Question 1
```

```
area_tblt = tabulate(Area)
```

```
area_tblt = 3x3
    1.0000  178.0000   37.2385
    2.0000  151.0000   31.5900
    3.0000  149.0000   31.1715
```

```
area_tblt = [area_tblt cumsum(area_tblt(:,2)) cumsum(area_tblt(:,3))]
```

```
area_tblt = 3x5
    1.0000  178.0000   37.2385  178.0000   37.2385
    2.0000  151.0000   31.5900  329.0000   68.8285
    3.0000  149.0000   31.1715  478.0000  100.0000
```

```
area_fable = array2table(area_tblt, VariableNames=["Area", "Abs. freq.", ...
    "Rel. freq. (%)", "Abs. cum. freq.", "Rel. cum. freq. (%)"])
```

```
area_fable = 3x5 table
```

	Area	Abs. freq.	Rel. freq. (%)	Abs. cum. freq.	Rel. cum. freq. (%)
1	1	178	37.2385	178	37.2385
2	2	151	31.5900	329	68.8285
3	3	149	31.1715	478	100

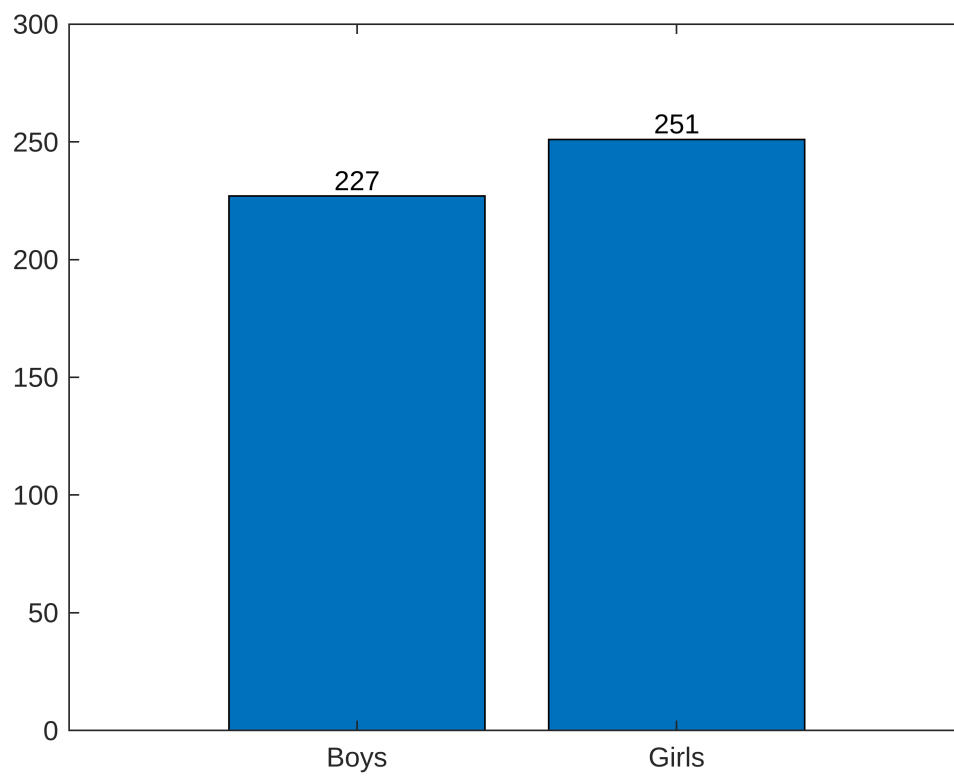
```
%% Question 2
```

```
gender_cat = categorical(Gender, [1 2], ["Boys", "Girls"])
```

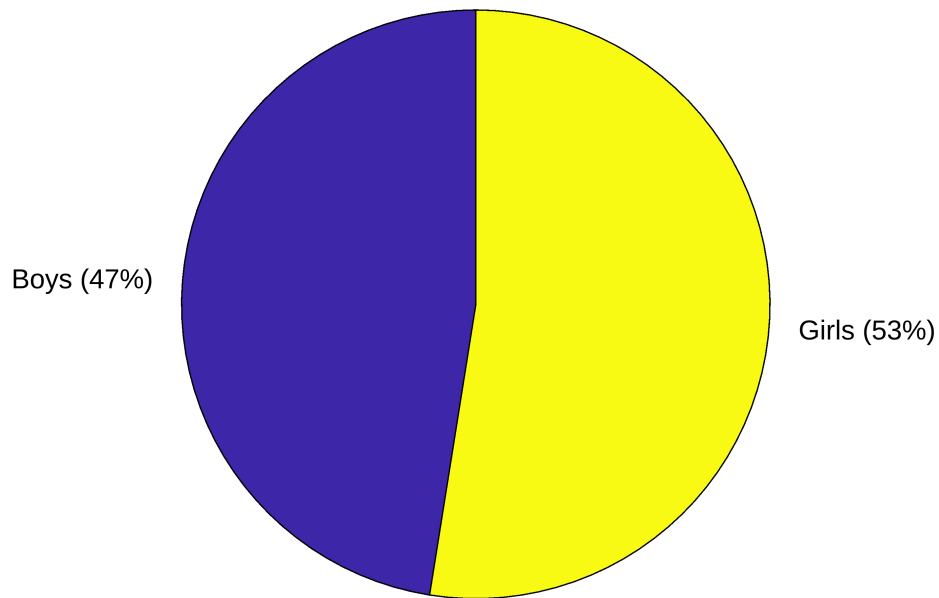
```
gender_cat = 478x1 categorical
```

```
Boys
Boys
Girls
Girls
Girls
Girls
Girls
Girls
Girls
Girls
Girls
:
```

```
b = bar(categorical(categories(gender_cat)), countcats(gender_cat));
text(b(1).XEndPoints, b(1).YEndPoints, string(b(1).YData), ...
    HorizontalAlignment="center", VerticalAlignment="bottom")
```



```
pie(gender_cat)
```



```
gender_al_cat = gender_cat(Area==1)
```

```
gender_al_cat = 178x1 categorical
Girls
Girls
Girls
Girls
Girls
Girls
Girls
Girls
Girls
Girls
Girls
:
```

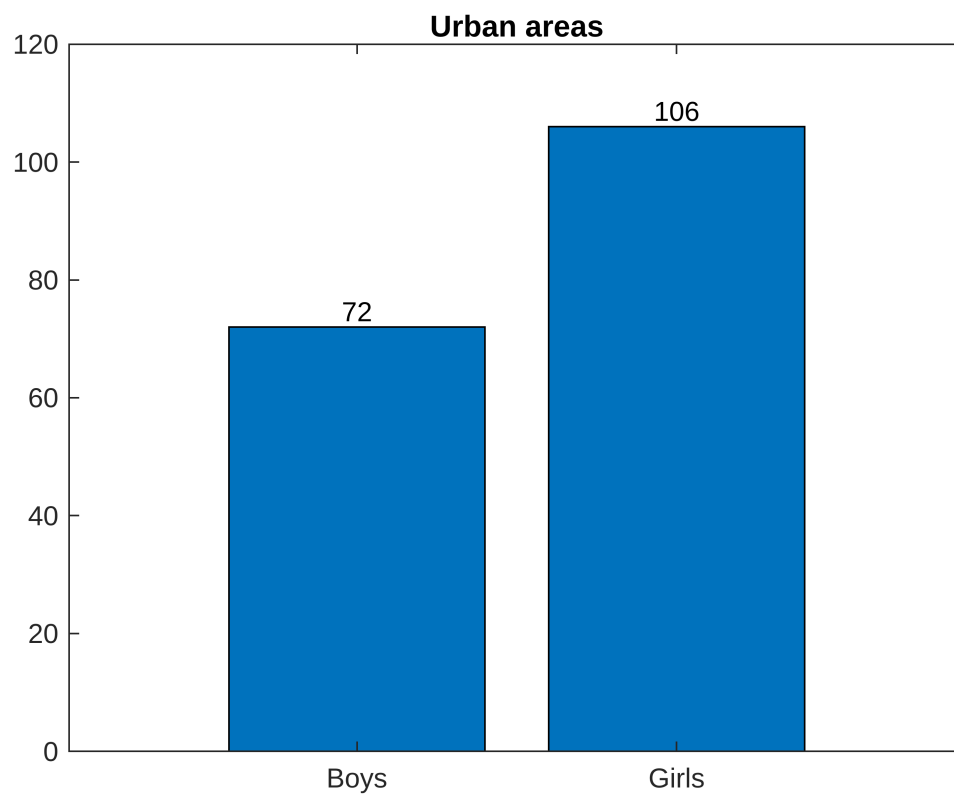
```
b_al = bar(categorical(categories(gender_al_cat)), countcats(gender_al_cat))
```

```
b_al =
  Bar with properties:

  BarLayout: 'grouped'
  BarWidth: 0.8000
  FaceColor: [0 0.4470 0.7410]
  EdgeColor: [0 0 0]
  BaseValue: 0
      XData: [Boys    Girls]
      YData: [72 106]
```

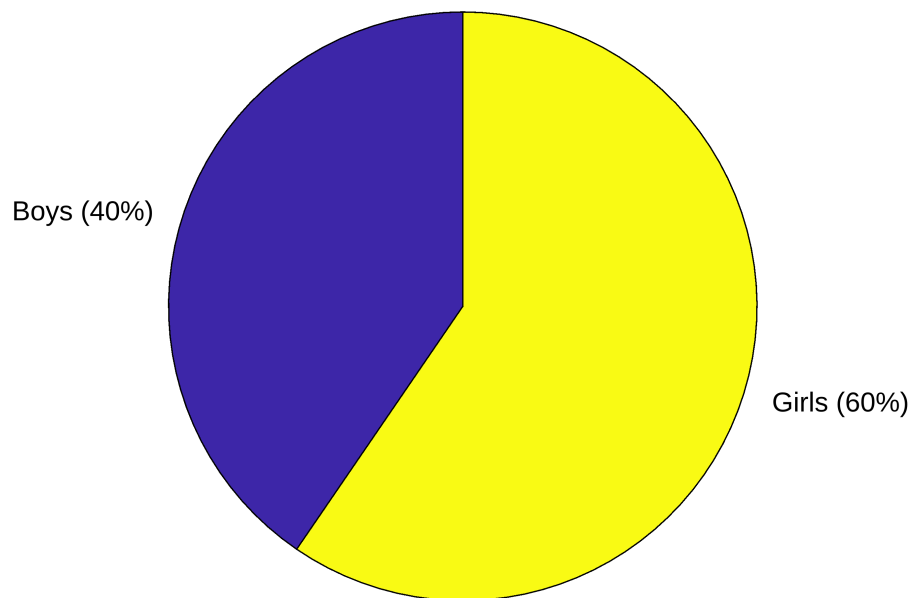
Show all properties

```
text(b_al(1).XEndPoints, b_al(1).YEndPoints, string(b_al(1).YData), ...  
     HorizontalAlignment="center", VerticalAlignment="bottom")  
title("Urban areas")
```



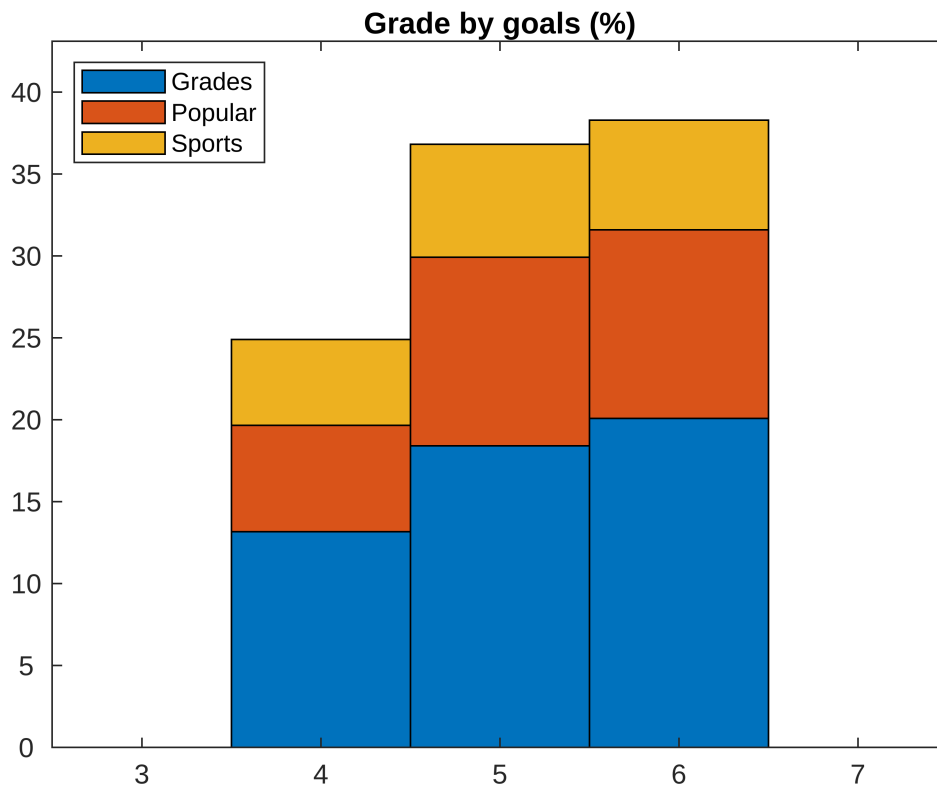
```
pie(gender_al_cat)  
title("Urban areas")
```

Urban areas

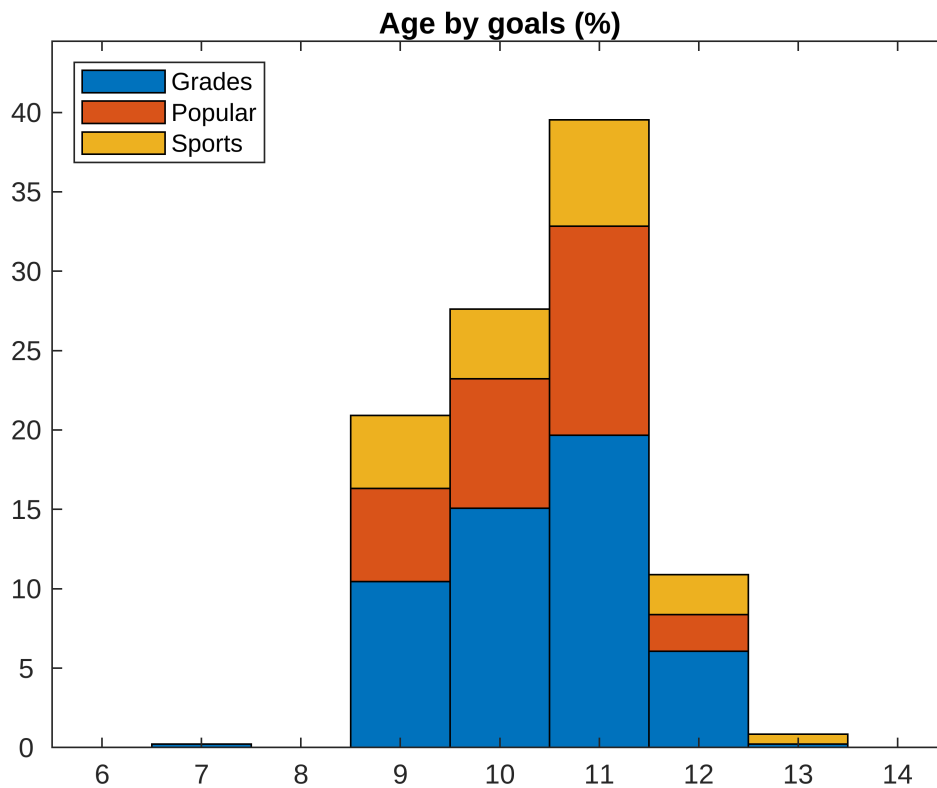


```
%% Question 3
```

```
clear opt;  
opt.dx = 1;  
opt.xmin = 2.5;  
opt.xmax = 7.5;  
histg(Grade, Goals, opt)  
legend("Grades", "Popular", "Sports", "Location", "northwest")  
title("Grade by goals (%)")  
set(gca, YTickLabel=get(gca, "YTick") * 100)
```



```
clear opt;  
opt.dx = 1;  
opt.pmin = 0;  
opt.pmax = 100;  
opt.xmin = 5.5;  
opt.xmax = 14.5;  
histg(Age, Goals, opt)  
legend("Grades", "Popular", "Sports", "Location", "northwest")  
title("Age by goals (%)")  
set(gca, YTickLabel=get(gca, "YTick") * 100)
```



```
stats_by_age = grpstats(table(Grades, Sports, Age), "Age", ["mean", "std"])
```

```
stats_by_age = 6x6 table
```

	Age	GroupCount	mean_Grades	std_Grades	mean_Sports	std_Sports
1 7	7	1	1	0	2	0
2 9	9	100	2.3800	1.1172	2.3400	0.9972
3 10	10	132	2.3485	0.9884	2.0379	0.9993
4 11	11	189	2.8571	1.0747	2.0582	0.9519
5 12	12	52	2.9038	0.9754	1.8077	0.9505
6 13	13	4	2.7500	1.5000	2.2500	1.2583

```
%% Question 4
```

```
gender_goals_ctab = crosstab(Gender, Goals)
```

```
gender_goals_ctab = 2x3
```

```
117    50    60
130    91    30
```

```
gender_goals_ctab_ = [gender_goals_ctab sum(gender_goals_ctab, 2)];
gender_goals_ctab_ = [gender_goals_ctab_ sum(gender_goals_ctab_)];
```

```
gender_labels = ["Boys", "Girls", "Any gender"];
goal_labels = ["Get good grades", "Be popular", "Be good at sports", "Any goal"];
```

```
gender_goals_abs = array2table(gender_goals_ctab_, RowNames=gender_labels, ...
    VariableNames=goal_labels)
```

gender_goals_abs = 3×4 table

	Get good grades	Be popular	Be good at sports	Any goal
1 Boys	117	50	60	227
2 Girls	130	91	30	251
3 Any gender	247	141	90	478

```
gender_goals_rel = array2table(gender_goals_ctab_/numel(Gender)*100, ...
    RowNames=gender_labels, VariableNames=goal_labels)
```

gender_goals_rel = 3×4 table

	Get good grades	Be popular	Be good at sports	Any goal
1 Boys	24.4770	10.4603	12.5523	47.4895
2 Girls	27.1967	19.0377	6.2762	52.5105
3 Any gender	51.6736	29.4979	18.8285	100