In[265]:=
```
n = Input["Input коллическво работ",]
```

Out[265]=
```
1
```

```
T = {}
Do[T = Append [T, Input["Input", {, , {}}]], {i, 1, n, 1}]
(*Ввод данных в формате {Работа ,Длительность ,{Предшественники }}*)
```

Out[266]=
```
{}
```

In[269]:=
```
T = {{1, , {}}, {2, , {}}, {3, , {2}}, {4, , {3}}, {5, , {1, 3}}, {6, , {4}}, {7, , {2}}, {8, , {6}}}
```

Out[269]=
```
{{1, Null , {}}, {2, Null , {}}, {3, Null , {2}}, {4, Null , {3}},
  {5, Null , {1, 3}}, {6, Null , {4}}, {7, Null , {2}}, {8, Null , {6}}}
```

In[270]:=
```
e = {}
v = {}
Do[ Do[ e = Append [e, T[[i]][[1]] ↦ T[[i]][[3]][[j]]], {j, 1, Length [T[[i]][[3]]], 1}],
 {i, 1, Length [T], 1}](*Задание графа по списку ребер*)
Do[v = Append [v, T[[i]][[1]]], {i, 1, Length [T], 1}](*Вершины*)
e
```

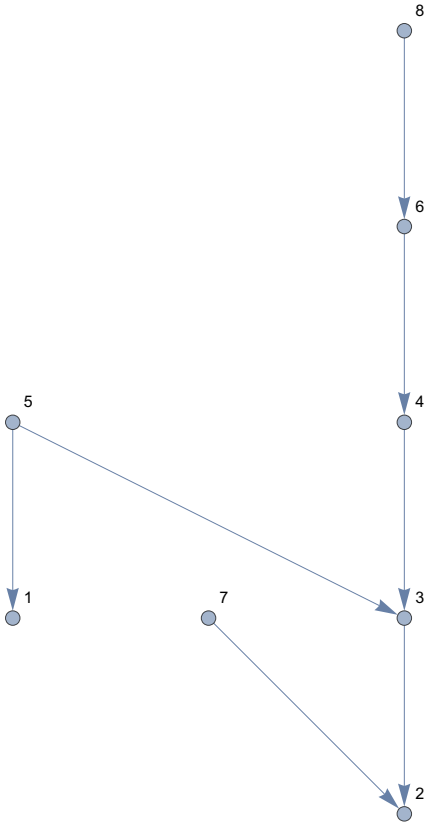
Out[270]=
```
{}
```

Out[271]=
```
{}
```

Out[274]=
```
{3 ↦ 2, 4 ↦ 3, 5 ↦ 1, 5 ↦ 3, 6 ↦ 4, 7 ↦ 2, 8 ↦ 6}
```

In[275]:=
```
g = Graph[v, e, VertexLabels → "Name"](*Прорисовка графа *)
```

Out[275]=



In[276]:=
```
mat = Table[AdjacencyMatrix [g]](*Матрица смежности *)
```

Out[276]=
```
SparseArray [ <> Specified elements: 7
Dimensions: {8, 8} ]
```

In[241]:=
```
MatrixForm [mat]
```

Out[241]//MatrixForm=

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \end{pmatrix}$$

In[277]:=
```
Do[ Do[If [mat[[i, k]] == 1,
    Do[mat[[i, j]] = If[(mat[[i, j]] + mat[[k, j]]) > 0, 1, 0], {j, 1, Length [T]}] ,
  {i , 1, Length [T]}], {k, 1, Length [T]}](*Матрица достижимости *)
```

In[278]:=
```
MatrixForm [mat]
```

Out[278]//MatrixForm=

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 1 & 0 & 0 \end{pmatrix}$$

In[279]:=
```
l = {Normal [mat[[1]]]}
k = {{1}}
Do[ If[Count [l, Normal [mat[[i]]] == 0, l = Append [l, Normal [mat[[i]]] ;
   k = Append [k, {i}] , k[[Position [l, Normal [mat[[i]]][[1]][[1]]] =
    Append [k[[Position [l, Normal [mat[[i]]][[1]][[1]]], i]], {i, 2, Length [T], 1}]
l(*Уникальные  строки *)
k(*Значения  Пи *)
```

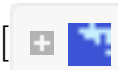
Out[279]= {{0, 0, 0, 0, 0, 0, 0, 0}}

Out[280]= {{1}}

Out[282]= {{0, 0, 0, 0, 0, 0, 0, 0}, {0, 1, 0, 0, 0, 0, 0, 0}, {0, 1, 1, 0, 0, 0, 0, 0},
 {1, 1, 1, 0, 0, 0, 0, 0}, {0, 1, 1, 1, 0, 0, 0, 0}, {0, 1, 1, 1, 0, 1, 0, 0}}

Out[283]= {{1, 2}, {3, 7}, {4}, {5}, {6}, {8}}

```
mattrans  = Transpose [mat](*Транспонированная  матрица  достижимости *)
```

Out[250]= SparseArray []

In[284]:=
```
l1 = {Normal [mattrans [[1]]]}
k1 = {{1}}
Do[ If[Count [l1, Normal [mattrans [[i]]] == 0, l1 = Append [l1, Normal [mattrans [[i]]] ;
   k1 = Append [k1, {i}] , k1[[Position [l1, Normal [mattrans [[i]]][[1]][[1]]] =
    Append [k1[[Position [l1, Normal [mattrans [[i]]][[1]][[1]]], i]], {i, 2, Length [T], 1}]
l1(*Уникальные  столбцы *)
k1(*Значения  p*)
```

Out[284]= {{0, 0, 0, 0, 1, 0, 0, 0}}

Out[285]= {{1}}

Out[287]= {{0, 0, 0, 0, 1, 0, 0, 0}, {0, 0, 1, 1, 1, 1, 1, 1}, {0, 0, 0, 1, 1, 1, 0, 1},
 {0, 0, 0, 0, 0, 1, 0, 1}, {0, 0, 0, 0, 0, 0, 0, 0}, {0, 0, 0, 0, 0, 0, 0, 1}}

Out[288]= {{1}, {2}, {3}, {4}, {5, 7, 8}, {6}}

In[289]:=
```
e1 = {}
Do[
 Do[ e1 = Append [e1, Position [k, k[[i]][[1]][[1]]] → (Position [k1, k[[i]][[j]][[1]][[1]] + Length [k])] ,
  {j, 1, Length [k[[i]]], 1}], {i, 1, Length [k], 1}]
e1(*Пути из Пи в p*)
```

Out[289]=
```
{}
```

Out[291]=
```
{1 → 7, 1 → 8, 2 → 9, 2 → 11, 3 → 10, 4 → 11, 5 → 12, 6 → 11}
```

In[292]:=
```
e2 = {}
Do[ Do[ If[MemberQ [Position [l[[j]], 1], {i}],
    e2 = Append [e2, (i + Length [k]) → Position [l, l[[j]][[1]][[1]]]],
  {j, 1, Length [k], 1}], {i, 1, Length [k1], 1}]
e2
(*Пути
 p в
 Пи*)
```

Thread : Objects of unequal length in {} Null {7 → 4, 8 → 2, 8 → 3, 8 → 4, 8 → 5, 8 → 6, 9 → 3, 9 → 4, 9 → 5, 9 → 6, 10 → 5, 10 → 6, 12 → 6} cannot be combined .

Out[292]=
```
Null {}{7 → 4, 8 → 2, 8 → 3, 8 → 4, 8 → 5,
  8 → 6, 9 → 3, 9 → 4, 9 → 5, 9 → 6, 10 → 5, 10 → 6, 12 → 6}
```

In[293]:=
```
e2
```

Out[293]=
```
{7 → 4, 8 → 2, 8 → 3, 8 → 4, 8 → 5, 8 → 6,
 9 → 3, 9 → 4, 9 → 5, 9 → 6, 10 → 5, 10 → 6, 12 → 6}
```

In[294]:=
```
ekon = Join[ e1 , e2](*Обьединяем пути для создания графа *)
```

Out[294]=
```
{1 → 7, 1 → 8, 2 → 9, 2 → 11, 3 → 10, 4 → 11, 5 → 12, 6 → 11, 7 → 4, 8 → 2,
 8 → 3, 8 → 4, 8 → 5, 8 → 6, 9 → 3, 9 → 4, 9 → 5, 9 → 6, 10 → 5, 10 → 6, 12 → 6}
```

In[295]:=
```
g1 = Graph[ekon , VertexLabels  → "Name"](*Прорисовка  графа *)
```

Out[295]=