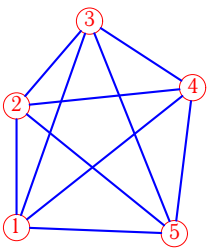
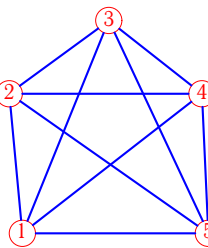
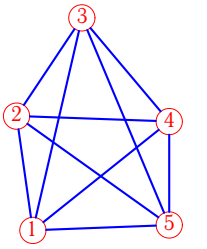
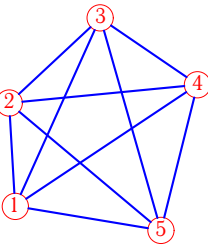
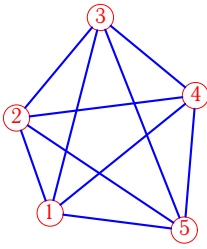
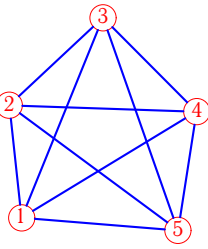


# Муравьиный алгоритм

Найти длину пути муравья в задаче коммивояжера. Начальная вершина 1. Дана последовательность  $P$  случайных чисел, выпавших в при выборе очередной вершины, расстояния  $L_{k,j}$  между вершинами  $k, j$  и интенсивность феромона  $\tau_{k,j}$  на ребре  $[k, j]$ . Секторы вероятности перехода сортировать по возрастанию номеров вершин. Использовать формулу вероятности перехода из вершины  $k$  в  $j$

$$P_{k,j} = 100 \frac{\eta_{k,j}^\alpha \tau_{k,j}^\beta}{\sum \eta_{k,i}^\alpha \tau_{k,i}^\beta}$$

при  $\alpha = 1, \beta = 1, \eta_{k,j} = 1/L_{k,j}$

<p><b>Задача i-12.1.</b></p>  <p><math>P = 74, 23, 27.</math></p>	<p style="text-align: center;"><i>Князев Артем</i></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ребро</th> <th><math>L_{k,j}</math></th> <th><math>\tau_{k,j}</math></th> </tr> </thead> <tbody> <tr><td>1-2</td><td>46</td><td>2</td></tr> <tr><td>1-3</td><td>82</td><td>1</td></tr> <tr><td>1-4</td><td>85</td><td>2</td></tr> <tr><td>1-5</td><td>59</td><td>1</td></tr> <tr><td>2-3</td><td>42</td><td>1</td></tr> <tr><td>2-4</td><td>67</td><td>2</td></tr> <tr><td>2-5</td><td>76</td><td>1</td></tr> <tr><td>3-4</td><td>46</td><td>2</td></tr> <tr><td>3-5</td><td>86</td><td>1</td></tr> <tr><td>4-5</td><td>55</td><td>2</td></tr> </tbody> </table>	Ребро	$L_{k,j}$	$\tau_{k,j}$	1-2	46	2	1-3	82	1	1-4	85	2	1-5	59	1	2-3	42	1	2-4	67	2	2-5	76	1	3-4	46	2	3-5	86	1	4-5	55	2	<p><b>Задача i-12.2.</b></p>  <p><math>P = 75, 37, 55.</math></p>	<p style="text-align: center;"><i>Сергомасов Илья</i></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ребро</th> <th><math>L_{k,j}</math></th> <th><math>\tau_{k,j}</math></th> </tr> </thead> <tbody> <tr><td>1-2</td><td>53</td><td>3</td></tr> <tr><td>1-3</td><td>86</td><td>2</td></tr> <tr><td>1-4</td><td>86</td><td>3</td></tr> <tr><td>1-5</td><td>70</td><td>2</td></tr> <tr><td>2-3</td><td>47</td><td>2</td></tr> <tr><td>2-4</td><td>72</td><td>3</td></tr> <tr><td>2-5</td><td>92</td><td>2</td></tr> <tr><td>3-4</td><td>45</td><td>2</td></tr> <tr><td>3-5</td><td>88</td><td>1</td></tr> <tr><td>4-5</td><td>53</td><td>2</td></tr> </tbody> </table>	Ребро	$L_{k,j}$	$\tau_{k,j}$	1-2	53	3	1-3	86	2	1-4	86	3	1-5	70	2	2-3	47	2	2-4	72	3	2-5	92	2	3-4	45	2	3-5	88	1	4-5	53	2
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<p><b>Задача i-12.3.</b></p>  <p><math>P = 63, 40, 71.</math></p>	<p style="text-align: center;"><i>Степанов Алексей</i></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ребро</th> <th><math>L_{k,j}</math></th> <th><math>\tau_{k,j}</math></th> </tr> </thead> <tbody> <tr><td>1-2</td><td>44</td><td>2</td></tr> <tr><td>1-3</td><td>82</td><td>2</td></tr> <tr><td>1-4</td><td>66</td><td>1</td></tr> <tr><td>1-5</td><td>51</td><td>2</td></tr> <tr><td>2-3</td><td>44</td><td>2</td></tr> <tr><td>2-4</td><td>57</td><td>1</td></tr> <tr><td>2-5</td><td>71</td><td>2</td></tr> <tr><td>3-4</td><td>51</td><td>2</td></tr> <tr><td>3-5</td><td>85</td><td>3</td></tr> <tr><td>4-5</td><td>39</td><td>2</td></tr> </tbody> </table>	Ребро	$L_{k,j}$	$\tau_{k,j}$	1-2	44	2	1-3	82	2	1-4	66	1	1-5	51	2	2-3	44	2	2-4	57	1	2-5	71	2	3-4	51	2	3-5	85	3	4-5	39	2	<p><b>Задача i-12.4.</b></p>  <p><math>P = 62, 57, 74.</math></p>	<p style="text-align: center;"><i>Иванов Алексей</i></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ребро</th> <th><math>L_{k,j}</math></th> <th><math>\tau_{k,j}</math></th> </tr> </thead> <tbody> <tr><td>1-2</td><td>39</td><td>3</td></tr> <tr><td>1-3</td><td>78</td><td>2</td></tr> <tr><td>1-4</td><td>82</td><td>3</td></tr> <tr><td>1-5</td><td>56</td><td>2</td></tr> <tr><td>2-3</td><td>47</td><td>1</td></tr> <tr><td>2-4</td><td>71</td><td>2</td></tr> <tr><td>2-5</td><td>75</td><td>1</td></tr> <tr><td>3-4</td><td>44</td><td>2</td></tr> <tr><td>3-5</td><td>83</td><td>1</td></tr> <tr><td>4-5</td><td>57</td><td>2</td></tr> </tbody> </table>	Ребро	$L_{k,j}$	$\tau_{k,j}$	1-2	39	3	1-3	78	2	1-4	82	3	1-5	56	2	2-3	47	1	2-4	71	2	2-5	75	1	3-4	44	2	3-5	83	1	4-5	57	2
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<p><b>Задача i-12.5.</b></p>  <p><math>P = 25, 35, 66.</math></p>	<p style="text-align: center;"><i>Бочков Тимур</i></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ребро</th> <th><math>L_{k,j}</math></th> <th><math>\tau_{k,j}</math></th> </tr> </thead> <tbody> <tr><td>1-2</td><td>38</td><td>2</td></tr> <tr><td>1-3</td><td>76</td><td>2</td></tr> <tr><td>1-4</td><td>70</td><td>3</td></tr> <tr><td>1-5</td><td>51</td><td>2</td></tr> <tr><td>2-3</td><td>49</td><td>1</td></tr> <tr><td>2-4</td><td>68</td><td>2</td></tr> <tr><td>2-5</td><td>76</td><td>1</td></tr> <tr><td>3-4</td><td>46</td><td>3</td></tr> <tr><td>3-5</td><td>86</td><td>2</td></tr> <tr><td>4-5</td><td>51</td><td>2</td></tr> </tbody> </table>	Ребро	$L_{k,j}$	$\tau_{k,j}$	1-2	38	2	1-3	76	2	1-4	70	3	1-5	51	2	2-3	49	1	2-4	68	2	2-5	76	1	3-4	46	3	3-5	86	2	4-5	51	2	<p><b>Задача i-12.6.</b></p>  <p><math>P = 52, 75, 67.</math></p>	<p style="text-align: center;"><i>Симонов Александр</i></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ребро</th> <th><math>L_{k,j}</math></th> <th><math>\tau_{k,j}</math></th> </tr> </thead> <tbody> <tr><td>1-2</td><td>43</td><td>3</td></tr> <tr><td>1-3</td><td>81</td><td>2</td></tr> <tr><td>1-4</td><td>77</td><td>2</td></tr> <tr><td>1-5</td><td>59</td><td>3</td></tr> <tr><td>2-3</td><td>48</td><td>1</td></tr> <tr><td>2-4</td><td>71</td><td>1</td></tr> <tr><td>2-5</td><td>79</td><td>2</td></tr> <tr><td>3-4</td><td>50</td><td>1</td></tr> <tr><td>3-5</td><td>85</td><td>2</td></tr> <tr><td>4-5</td><td>45</td><td>2</td></tr> </tbody> </table>	Ребро	$L_{k,j}$	$\tau_{k,j}$	1-2	43	3	1-3	81	2	1-4	77	2	1-5	59	3	2-3	48	1	2-4	71	1	2-5	79	2	3-4	50	1	3-5	85	2	4-5	45	2
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