Management of ICT Projects
2nd Assignment

Issued: 10/04/2025 **Due**: 30/04/2025

Exercise 1 - CPM

A company has developed a large information system. The whole project requires the implementation of 12 activities for its completion. The relationships between the activities, as well as the duration, are given in the following tables:

Activity Id		***Activity Id***
100	*Must be finished before…*	201, 202 can start
101		301
102		203, 204
201		302
202		301
203		301
204		303, 304
301		401
302		401
303		401
304		-
401		-

Activity Id	***Duration (in days)***
100	14
101	10
102	13
201	15
202	25
203	12
204	14
301	17
302	13
303	10
304	10
401	11

1. Which is the critical path and what is the completion time of the project?
2. If activity 203 is delayed by 9 days, will the implementation time of the project be affected and, if so, why?
3. If activity 204 requires 19 days instead of 14, what will happen in relation to the project implementation time and why?
4. In a meeting that took place 16 days after the start of the project, the following were found:
   - Activities 100, 101 and 102 were carried out according to the original planning.
   - Activities 201 and 202 are ongoing and require 6 and 10 days to be completed, respectively.
   - Activities 203 and 204 are also in progress and require 3 and 21 days to be completed, respectively.

– For activity 303, a new estimate of its duration was made, and it was estimated that it would take 12 days to complete.

– For activity 304 it was decided that it could be implemented in 5 days, while the remaining activities are estimated to be carried out according to the original planning.

Which is the **new critical path and the new completion time** of the project?

Exercise 2 - PERT

The design-coding phase of a small software package is estimated to contain unbalanced factors. Thus, the nine activities that it consists of, were evaluated with 3 different durations in weeks: the optimistic (a), the most probable (m) and the pessimistic (b).

The estimates of duration (in weeks) and interdependencies of activities are given in the following table:

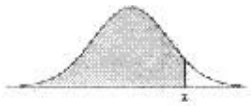
Activity	a	m	b
A	0,50	1	1,5
B	2	4	6
C	2	3	4
D	6	7	8
E	4	6	8
F	1	2	3
G	6	7	8
H	6	9	12
I	2	4	6

If we assume that the critical path includes activities A, B, E, G & I, then answer the following questions:

1. What is the expected completion time of the project?
2. What is the probability that the project will be completed one week earlier than expected?
3. What is the probability that the project will not be completed within 24 weeks?
4. If we want to have just a 10% chance of failing in the planning of our actions, then how long will the project last?

Appendix

Tables of the Normal Distribution



Probability Content from -oo to Z

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990